



Supporting the Entrepreneurial Potential of Higher Education

*Final Report
Appendix: Case studies*

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Section 1: Case Studies

1. Bucharest University of Economic Studies, Romania: Developing a strong and distinct position for providing entrepreneurship education

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Abstract



Bucharest University of Economic Studies (ASE) offers a portfolio of diversified Bachelor, Master, MBA and PhD programmes in the field of Business Administration related to entrepreneurship, mostly provided via its Faculty of Business Administration in Foreign Languages (FABIZ). The Faculty's mission is to form specialists in business administration, able to meet both the development needs of multinational companies operating in Romania and the requirements of Romanian companies interested in expanding at international level, as well as the desires of their students to become entrepreneurs. As indicated by its name, all curricular entrepreneurship offers at FABIZ are taught in foreign languages, especially in English, French and German. Moreover, international team teaching is employed in all three language tracks. Of particular interest is the "Entrepreneurship and Business Administration in the Energy Sector" Master programme offered at FABIZ, which is the first programme in Eastern Europe with a focus of Entrepreneurship in the energy sector. One extra-curricular activity of importance at ASE and FABIZ is the Junior Achievement Programme (JAP), which is an international start-up programme where students present their business ideas at a national competition. Professors from FABIZ integrate JAP into their curricular offers and provide start-up counseling and coaching to the students during the project in cooperation with external coaching from entrepreneurs. In the past, FABIZ students won the JAP and thereby gained fundamental support in implementing their business ideas.

Case study fact sheet

▪ Full name:	The Bucharest University of Economic Studies (Academia de Studii Economice din București, ASE), Bucharest, Romania
▪ Legal status :	Public University
▪ Location	12 faculties (11 in the fields of business and economics and 1 in public administration), located on 9 campuses in Bucharest
▪ Year of foundation	6 th April 1913
▪ Number of students:	21,113 students in 2013/2014
▪ Number of employees :	Approximately 2,000
▪ Budget:	n.a.
▪ Academic profile:	<p>Twelve faculties: Business Administration in Foreign Languages (FABIZ); Administration and Public Management (AMP); Bucharest Business School (BBS); Economic Cybernetics, Statistics and Informatics (CSIE); Business and Tourism (formerly Commerce); Accounting and Management Information Systems (CIG); Agrifood and Environmental Economics (EAM); Theoretical and Applied Economics (formerly Economics); Finance, Insurance, Banking and Stock Exchange (FABBV); Management; Marketing; and International Business and Economics (REI).</p> <p>ASE is the most prestigious Romanian university in Economics, Business Administration and Public Administration (http://www.ase.ro/index_en.asp)</p>
▪ Entrepreneurship education profile:	Five professional Master's programmes, including one in Entrepreneurship and Business Administration for the energy sector, as well as a Bachelor programme in Business Administration focussing on specific entrepreneurship topics.
▪ Activities focused in	Design of curricular entrepreneurship; team teaching and teaching in

this case study:	foreign languages; promoter of entrepreneurship education
▪ Case contact person:	Prof. univ. dr. dr. Adrian D. Tanțău, Dean of FABIZ

Information included in this case study is from end of April 2015 unless stated differently.

1.1. The university's entrepreneurial profile

1.1.1. The university's overall approach to entrepreneurship education

The Bucharest University of Economic Studies (ASE) is a Business University located in Romania's capital city Bucharest in the southeast of the country. Bucharest is not only the largest city of Romania, but also the cultural, financial and industrial centre of the country. ASE is ranked as a top European university in adapting innovative learning and teaching processes as well as contents; proficient in responding to environmental change in general and in building up long-term partnerships by the integration of stakeholders.

The research intensive university offers diversified Bachelor, Master, MBA and PhD programmes in foreign languages, especially in English, French and German. As one of the most *"diversity specialized universities in Europe"*, it has the nation's highest range of Bachelor's and Master's study programmes in the fields of business, economics, and public administration. This prestigious higher institution in Romania has a total enrolment of 21,113 students in 2013/2014 and is comprised of overall twelve faculties in the fields of business, economics and public administration and 22 departments (see academic profile above).

ASE's targeted educational approach is described as follows on its website: *"The Bucharest University of Economic Studies is and wishes to remain the most prestigious institution of higher economic and public administration education in Romania and to rank amongst the top universities in Europe, as regards the content and modernity of the teaching and learning process, the dynamism of innovation, the implication in strategic partnerships with representatives of the national and international economic and social environment. [...]. Created to address each student's needs, with groundbreaking research sustaining a hands-on approach on economic studies, ASE's curriculum proposes a wide range of activities, exposing students to globally validated new economic theories, real-business-oriented study programmes and direct contact with the business community through lectures, workshops, business simulations, internships, cultural and social events."*

The Faculty of Business Administration in Foreign Languages (FABIZ), as one of the main faculties, represents the focus of this case study. FABIZ is one of the newest faculties of ASE being founded in 1990 while ASE itself was established in 1913 as the oldest university in Romania. Entrepreneurship became a topic of importance at FABIZ shortly after the turn of the millennium. During that time UNESCO-CEPES for Higher Education was located in Bucharest. Initiated by Dr. Sadlak and Prof. Vlascetanu from UNESCO-CEPES, strong impulses were given to implement entrepreneurship at Higher Educational Institutions in Romania in general and Bucharest in particular. Prof. Pop, former dean of FABIZ, established entrepreneurship at the university and prioritized this topic via the UNESCO-Chair for Business Administration at FABIZ in close cooperation with UNESCO-CEPES. Prof. Tanțău, current dean of FABIZ, stepped into Prof. Pop's footsteps by perpetually prioritizing entrepreneurship and extending the curriculum with entrepreneurial activities.

FABIZ pursues a distinctive teaching approach and commitment towards entrepreneurship education. This teaching approach is expressed in hands-on experienced learning, real-business-oriented study programmes and direct interaction with the business community through lectures, workshops, internships or social events. Additionally, the Division of Research and Innovation Management coordinates the research activities of the Bucharest University of Economic Studies. The Research Center for Business Administration is established with the purpose of *"developing an entrepreneurial culture in Europe, through promoting values and practices specific to entrepreneurial management"*.

ASE and FABIZ offer several curricular activities involving entrepreneurial thinking and acting as well as spreading an entrepreneurial mindset in an international context. In this case study, two programmes established by the FABIZ are highlighted to show how Entrepreneurship Education

can be implemented in combination with new study areas (see: the Master's programme in Entrepreneurship and Business Administration for the Energy Sector in section 1.2.1) and how team teaching methods can contribute effectively to the curriculum (see: the double degree Romanian-German MBA programme in Entrepreneurial Management in section 1.2.1). Moreover, the Entrepreneurship Culture course is described in depth as an illustration of an own standing entrepreneurship course (see section 1.2.1).

Moreover, extra-curricular activities like the Junior Achievement Programme (JAP) or The Forum for Sustainable Development and Entrepreneurship held with academic, strategic, institutional and media partners deal with entrepreneurial topics and therefore strengthen the stakeholders' perception of entrepreneurship as part of the ASE and FABIZ.

1.1.2. Leadership and governance

Importance of government strategies

In theory, entrepreneurship is encouraged by the government in Romania but in practice little commercialisation of entrepreneurship takes place. Numerous regulations and the fear of punishment for mistakes limit entrepreneurial potential in Romania. Bureaucratic hurdles and financial restrictions may further hamper entrepreneurial activities.

The contribution of the university's German MBA programme to the Bologna process is stressed on its website since it is *"a Masters Programme, designed according to ECTS, modular, and it fosters the mobility of students and the international competitiveness and gives stimulation to the labor market."*

Importance of entrepreneurship in the university's strategy

As a consequence of the challenges, the Romanian government has established a new strategy for entrepreneurship. At the university level, this strategy implies that entrepreneurship is ideally addressed at the faculty level and not at the university level. However, in the case of ASE, entrepreneurship is not explicitly commercial from the university management though university-wide support although it is appreciated if a faculty prioritises and addresses entrepreneurship via its own resources. While at FABIZ entrepreneurship is clearly commercial as a priority area.

Entrepreneurship as an *"opportunity to develop your own business"* is part of the university's strategy. It is proclaimed on its website to be one of the most prestigious advantages for studying at ASE:

"While getting constant feedback from the global business and academic environments, ASE is constantly updating the quality and the efficiency of existing programmes, as well as developing new courses of study. As a globally open entrepreneurial university we envision our future development in partnership with our students, teachers and researchers in order to add more value to economy and society. Our vision comprises an improved institutional environment and culture, more opportunities of professional and personal development, a wider range of business partners and professional networks and a continuously innovative approach to research, teaching and learning."

Extent of high level commitment to implementing entrepreneurship

In the charter of ASE are no indications to prove the extent of commitment to entrepreneurship. In fact, the extent of high level commitment to implement entrepreneurship is restricted to several promoters of entrepreneurship education. These promoters play a major role in implementing entrepreneurial mindset and competencies within the university's commercialisation. Especially the initiatives of Prof. Pop and Prof. Tanțău, former and present dean of FABIZ, result in entrepreneurial learning outcomes throughout the curricular programmes offered by FABIZ. During the interviews, Prof Tanțău specifically points out his ambition to promote the entrepreneurial spirit at FABIZ and ASE.

Level of faculties' and units' autonomy to act

At ASE, individual faculties such as FABIZ do possess autonomy to act as opposed to a centralized approach. However, freedom to change existing structures and procedures is limited

through strict and time-consuming regulations and regular requests for approval from the university management.

University's importance for driving entrepreneurship in its environment

Romanian universities, such as ASE, play an important role in strengthening the entrepreneurship culture in Romania.

1.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

There are almost 800 faculty members at ASE. At least one third of these employees are coming from the business environment. Out of all faculty members, six professors and six PhD students are dedicated exclusively to entrepreneurship.

As described above, one key promoter of entrepreneurship at ASE is Prof. Tanțău, the Dean of FABIZ, with his UNESCO-department for Business Administration at FABIZ which is the smallest department of ASE with 20 professors, additional assistant professors and external PhD students. Prof. Tanțău has a background in electrical engineering and management and partially works as a consultant as well. One interviewee mentioned that Prof Tanțău is omnipresent in economic life in Bucharest which has facilitated the strong ties of FABIZ with its business environment (see section 1.5). He also possesses strong international relationships which is, for instance, revealed in the MBA Programmes taught in foreign languages in cooperation with lecturers from abroad (see section 1.2).

Financial resources for entrepreneurship education

There are no financial resources at ASE and FABIZ specifically dedicated to entrepreneurship education. Special resources are solely obtained if entrepreneurship-related projects are acquired. As an example, there was an entrepreneurship academy project and an equal changes project in business for men and women generating extra fees.

1.2. Entrepreneurship in curricula and teaching

1.2.1. Overview of curricular offers

One unique aspect in case of FABIZ is the fact that all curricular offers in entrepreneurship education are provided in foreign languages. Hereby, a distinction can be made between English, French and German tracks. Moreover, team teaching is employed in all three tracks. This implies that classes are lectured by local staff in combination with a foreign lecturer who speaks the mother tongue of the respective language of the programme. In addition to language-oriented teaching, an emphasis is also placed on practice-oriented team teaching where entrepreneurs teach courses together with university lecturers. This approach is particularly employed within the "Entrepreneurship and Business Administration in the Energy Sector" Master programme which is offered since October 2014. This Master programme is the first programme of its kind with a focus of Entrepreneurship in the energy sector in Eastern Europe (see Box 2).

The overall aim of the innovative curricular approaches of FABIZ is to broaden the horizon of the teaching activities to a practical and international setting and to distinguish itself from curricular offers by other universities and faculties. ASE in general and FABIZ in particular offer, therefore, a large variety of courses related to entrepreneurship. There are mainly compulsory entrepreneurship courses provided in three out of the twelve faculties at ASE. Some other courses may still indirectly relate to entrepreneurship but first and foremost **FABIZ, the Bucharest Business School and the Faculty of Business and Tourism (formerly Commerce) are actively committed to entrepreneurship education.**

FABIZ teaches **several** Bachelor and Master Programmes with an intensive entrepreneurship education approach. These include the Bachelor Degree Programmes in Business Administration taught in English, French and German tracks; the Master Degree Programmes in Entrepreneurship and Business Administration taught as well in English, French and German; the Romanian-German MBA in Entrepreneurial Management (see Box 1), the Master in

Entrepreneurship and Business Administration in the Energy Sector in English (see Box 2) and the Master in Business Research in English for future PhD students. The **Romanian-Canadian Master of Business Administration and the Romanian-French MBA in The Economic Development of Enterprises** are organised by the Bucharest Business School. The Bachelor Degree Programme in Business Administration offered by the **Faculty of Business and Tourism likewise contains entrepreneurship courses**. The main curricular offers are outlined below to highlight the curricular diversity and progression at large.

As mentioned above, FABIZ is proficient in combining entrepreneurship education with the sector of Sustainability and Energy (see Box 2). In addition, ASE offers three international MBA programmes with a commercialisation on entrepreneurial education: firstly, the "Romanian-French MBA in the Economic Development of Enterprises", secondly, the "Romanian-German MBA in Entrepreneurial Management" (see Box 1) and thirdly, the "**Romanian-Canadian Master of Business Administration**". The Romanian-French double degree programme is accredited by the Association of MBA Schools in London and was established amongst others by means of an inter-governmental agreement between Romania and France in compliance with the National Institute for Economic Development and the Faculty of Management as well as with the National Conservatory of Arts and Crafts of Paris in 1991. The Romanian-German MBA, accredited from the *Foundation for International Business Administration Accreditation* until 2019 in Bucharest, is a double-degree diploma in cooperation with the Westfälische Hochschule (University of Applied Science) in Gelsenkirchen, Germany (see Box 1). The **Romanian-Canadian Master of Business Administration organised by the Bucharest Business School has been offered since 1991 and relates business and managerial courses with leadership and entrepreneurship**. All three MBA programmes reflect the team-teaching approach employed at FABIZ.

The teaching methods and devices at FABIZ have changed and developed over time to adapt more recent and innovative topics. Partially to further consider and meet employment changes criteria. This modulation shall enable a better preparation of the students for their prospective jobs and prepare them for an international career. Simultaneously, it can be observed that students display more concrete visions of their future jobs – most frequently within the area of entrepreneurship.

There exists no overarching, broad structure at ASE and FABIZ for entrepreneurship education, although most courses at FABIZ include entrepreneurship either directly or indirectly. As a result, the implementation of entrepreneurship education varies on a course-to-course basis and follows heterogeneous didactical strategies. FABIZ offers, for example, interactive seminars in the fields of Strategy and Entrepreneurship for Bachelor and Master Students, including subjects such as Female Entrepreneurship or Business Model Tools. The Entrepreneurship Culture Course as a representatively selected seminar addresses Bachelor students at an early stage of their studies to gain first hands-on entrepreneurial experiences (see Box 3). Differences were also shown in the foreign language tracks. In the past, the German track revealed a stronger business focus whereas the English and French tracks displayed an economic emphasis. But these disparities have phased out over time. The unique combination of entrepreneurship with the energy sector (see Box 2) of FABIZ shows that external stakeholders such as The International Chamber of Commerce are involved in the design of entrepreneurship education (see section 1.5).

One future focus area will be a new course on social entrepreneurship for undergraduates within the English track. It was planned, for the first time, to be offered from fall 2014 onwards. This course aims to explore all components of social entrepreneurship (e.g. social need, social problems, converting ideas into entrepreneurial action, social capital and networks, evaluating and measuring the social impact as well as Corporate Social Responsibility). To deepen the knowledge and understanding for social actions on a national level, networks and collaborations with different commercialisations in the social economy (i.e. Non Governmental Organisations, associations, foundations, and research institutes) shall be expanded and different social European projects shall be explored. A central platform needs to be established to link all these initiatives and programmes. Detailed information about the curricular offers related to entrepreneurship education at ASE and FABIZ can be found in the tables, boxes and sections below.

Box 1: Entrepreneurial Management

Entrepreneurial Management

The Romanian-German 2-years MBA programme in Entrepreneurial Management (see: mbaromanogerman.ase.ro) is offered by the FABIZ in cooperation with the Institute for Entrepreneurship and Innovation Management of the Westfälische Hochschule (University of Applied Science) in Gelsenkirchen, Germany .

Its mission is to promote leadership while focusing on the business environment in Romania, to qualify students in starting an international career by facing scientific qualifications in general and to transfer (social) entrepreneurial and innovation skills.

This double degree MBA programme was implemented in 2006 and was reaccredited by the international FIBAA commission (Foundation for International Business Administration Accreditation, Germany) until 2019. The annual tuition fee EUR 3500 is ranked as a moderate total cost for such an MBA programme.

Target group

The application process, thus the study programme, is open to Romanian and international graduates with a Bachelor's Degree regardless of the profile. Additional requirements for admission are at least two years of professional work experience and good knowledge of German and English. Suitable candidates are selected by interviews. There are an estimated total of 50 graduates per year.

Programme design

Teaching methods include interactive team teaching. Each course is supported by a team of a Romanian specialist and a German partner. The main courses designed with a strong focus on entrepreneurship and entrepreneurial activities are the following: Business games, entrepreneurship and corporate culture, financing (start-Up and growth financing) in English, entrepreneurial marketing and customer relationship management, processes and quality management and innovation management. Besides courses and lectures, there are written seminars concentrating on the practice relevant creation and evaluation of business plans. Furthermore, students are actively involved in the lectures by discussing latest topics or preparing case studies.

Setting

The MBA programme consists of a total of 20 modules and should be completed in 4 semesters. 18 modules are taught in German and two modules in English. The classes take place on a regular basis (every two or three weeks) on the weekend (Fridays and Saturdays from 8 am to 6 pm; Sundays from 8 am to 3 pm). To successfully complete each module, there is an exam on Sunday, at noon.

Students receive two diplomas; the MBA from the University of Applied Sciences Gelsenkirchen and the Master Diploma of ASE Bucharest after successfully finishing all 20 modules.

Persons involved

Due to the international partnership, there are several persons involved in the curricular entrepreneurship education to balance and link the profound theory and practice part of the programme. Foremost among these are German and Romanian Professors and experts, managers and entrepreneurs from the industry who are involved in guest lectures and so-called live cases.

Box 2: Entrepreneurship and Business Administration in the Energy Sector

Entrepreneurship and Business Administration in the Energy Sector

The Master's programme in "Entrepreneurship and Business Administration for the Energy Sector" is a modified Master's programme of the general Master's programme in Entrepreneurship and Business Administration. This Master programme combines entrepreneurial thinking to innovations in the (renewable) energy field and focuses on entrepreneurship related to business development in energy.

Target group

The lectures and courses are defined especially for Master Students with strong interest in entrepreneurship and the energy sector.

Programme design

The modules consist of different lectures and seminars. The curriculum focuses to a large extent on the energy sector (i.e. coal, gas, oil, renewable energies) in at least 80% of all courses. One example of a module closely related to entrepreneurship within this Master Programme is a course on the financing of start-ups in the energy sector. Precise course and lecture content is designed with the needs of the Romanian business environment due to a series of meetings and debates between professionals. The content is directly aligned with stakeholder expectations. Students learn to analyse ecology and economics of wind, hydro, biomass and solar energy; gain knowledge of technologies for renewable energy and marketing of emissions. Moreover, they gain insights of Entrepreneurship/Intrapreneurship in the energy field. Seminars (subjects are e.g. "Intrapreneurship and spin-off in energy" or "Ecology entrepreneurship in energy") are often designed as case studies with matching project elaboration afterwards. The teaching method contains interactive methods using media technology to integrate the students properly and actively. In general, the course objectives aim to support the Master students in thinking systematically, evaluate and develop opportunities and business ideas in the renewable energy field as an individual or within an existing enterprise team.

Persons involved

There are two specialists for each module: There is at minimum one specialist from the energy sector as a practical expert who creates the curriculum in cooperation with a university expert. Hence, a practice-oriented team teaching approach is employed.

Box 3: Entrepreneurship Culture Course**Entrepreneurship Culture Course**

The Entrepreneurship Culture course is a seminar addressed to students of the Bachelor Programme in Business Administration. This Bachelor's seminar aims to foster entrepreneurial action by developing business plans and growth strategies and presenting insights on different subjects of entrepreneurship in depth. One aspiring development is to deepen the collaboration with companies through practical education within the scope of this seminar. Its mission is to facilitate students' entrepreneurial and business skills as real world business experience applied to "making an idea work".

Target group

The course mainly addresses first-year Bachelor students in the field of business studies. It is an obligatory seminar within this Bachelor Programme. Diversity in terms of the age, nationality and gender of the participants is encouraged. The seminar has been offered since 2014 with around 60 students from the German track and, if combined with the English and French track, it has approximately 200 students participating in the course.

Programme design

The overarching goal of the course is that the participants ideally become entrepreneurs themselves. Related aims include the development of thinking capabilities for entrepreneurial action and skills for the establishment of own business plans and growth strategies. The seminar is theoretically grounded based on the results from entrepreneurship research. Further objectives include showing students how the entrepreneurial environment works and thereby getting them to develop an entrepreneurial mindset by starting to think about becoming entrepreneurial. Contents of the seminar include background information on the steps for creating a business plan, the development of an idea, transforming an idea to a business opportunity, team composition, market positioning, designing, product or service testing as well as commercialisation and finance knowledge. In terms of methods and media, presentations from young entrepreneurs in combination with university academics are employed. Moreover, a manual and recipes for success and failure are distributed to the students. If desired, students receive informal evaluation through individual feedback by the course instructors.

Setting

The educational activities take place at FABIZ with weekly classes of 90 minutes each for 14 weeks. Concerning the evaluation of the students, a total of 40 points for participation in the seminar can be gained. Out of these points, up to 10 points can be obtained for the contest and up to 30 points for the written business plan. As an alternative to contest participation, students can conduct a test. Around 60% of the students choose to participate in the contest while the remaining 40% select the test alternative.

Persons involved

There are several persons involved in this course due to the theoretical and practical orientation of the seminar. Internal support is available for entrepreneurs, which includes start-up consulting either from professors or researchers. Guest lectures by young entrepreneurs of small firms are an inherent part of the class. Concerning the external network, state initiatives to support young entrepreneurs are not yet developed in collaboration with entrepreneurs.

Exhibit 1: Overview of curricular entrepreneurship education offers at the Bucharest University of Economic Studies

No.	Name	Objectives	Target group	Offered since	No. of participants in [year]
1a	Business Administration in English	<p>Main course "Entrepreneurship Culture": development and transformation of a business idea, managing and growing the start-up, financing and funding, economic impact on the start-up, corporate entrepreneurship, franchising, women entrepreneurs, the entrepreneurial student, the entrepreneurial university</p> <p>Research interest (topics for Bachelor theses): determinants of entrepreneurial engagement levels in Romania vs. Other European countries, the entrepreneurial process – from market entry to growth to exit, relationship between entrepreneurship and economic performance, role of the entrepreneur in the process of identifying opportunities, education for entrepreneurship: the role of the entrepreneurial university, social entrepreneurship, women entrepreneurship in Romania: insights, policies and contribution, the entrepreneurial manager: motivations, values, skills and visions</p>	Bachelor students	2014	100
1b	Business Administration in French	<p>Business courses (e.g. Audit, Marketing, Finance, Economics)</p> <p>Main course "Entrepreneurship Culture": risks and difficulties of young Romanian entrepreneurs, general requirements of an entrepreneur, resource allocation, strategies to implement a new idea on the</p>	Bachelor students	2014	60

		market Research interest (topics for Bachelor theses): the ideal profile of the entrepreneur, the odds of female entrepreneurship, burdens of starting a business, the impact of media communication etc.			
1c	Business Administration in German	Main course "Entrepreneurship Culture": Identifying and understanding success factors for entrepreneurship Research interest (topics for Bachelor theses) is combined with case studies in context of energy or renewable energy e.g. business incubators and spin off firms, intrapreneurship (corporate entrepreneurship), open innovation	Bachelor students	2014	70
2	Entrepreneurship and Business Administration (in English / French / German)	Entrepreneurship and Business Development	Master students	2014	90 / 45 / 50
3	Entrepreneurship and Business Administration in the Energy Sector (in English)	To gain insights of entrepreneurship and intrapreneurship in the energy sector.	Master students	2014	15
4	Romanian-German MBA programme in Entrepreneurial Management	Entrepreneurship course outline: business games, entrepreneurship and corporate culture, financing (start-up and growth financing) in English, entrepreneurial marketing and customer relationship management, processes and quality management, Innovation management Seminars: Creation and evaluation of a business plan I + II	Graduates with Bachelor's Degree, regardless of the profile, Additional requirements: minimum of two years of professional work experience and good knowledge of German and English	2006	50 (total number of graduates/year)
5	Romanian-French INDE MBA programme in the Economic Development of Enterprises	Developing the entrepreneurial spirit as one specific goal of the double degree MBA programme of the Bucharest Business School	Master students, management specialists	1991	NA
6	Romanian-Canadian Master of Business Administration	Capturing current and future business demands in a diversified and generalized manner, while focusing on entrepreneurship and leadership	Master students, professionals	1991	NA
7	PhD Programme of the Doctoral School in Business Administration	Focus research: entrepreneurship, cooperate entrepreneurship in the energy field, social entrepreneurship e.g. "renewable energy entrepreneurship", "social entrepreneurship as economic	PhD candidates	2005	Approx. 3

		and social innovation driver in the private sector”, “creating social innovation and entrepreneurship in the public sector” etc.			
8	Summer School	The Bucharest University of Economic Studies organises annually two summer schools with specific focus on entrepreneurship education as a multi-cultural and academic event: - “Entrepreneurship and German Language” (duration: 2 months, August – September) - “Creativity and Innovation for Sustainable Development” (duration: 1 month, September)	All students	NA	NA
9	Entrepreneurship Culture	Developing an entrepreneurial mindset, getting acquainted with the entrepreneurial environment and fostering own entrepreneurial behaviour from students	NA	2014	200 participants in total of the German, French and English track

1.2.2. Target groups

Main target groups of entrepreneurship education

The main target groups of entrepreneurship education are students from ASE itself. Next to internal students, international students from foreign universities are also targeted within particular curricular offers. Moreover, some curricular offers are aimed at Postgraduate and/or MBA students with a high level of competencies, work experiences and managerial ability. Besides these, courses might be targeted at PhD students who have to take courses with exams as part of their PhD studies at ASE. In addition to the target groups above, curricular offers are at times also directly aimed at students who are entrepreneurs themselves, for example within the double-degree diploma in cooperation with the Westfälische Hochschule (University of Applied Sciences) in Gelsenkirchen, Germany. A further particularity that should be highlighted with respect to target groups is the fact that the Master Programme for the energy sector is concretely tailored to the needs and demands of the energy sector in Romania. For further information about the target groups per course, please see exhibit 1 above.

Specificities

One particular target group is PhD students in entrepreneurship at ASE who have to engage in courses as part of their PhD studies. There are no obligatory courses for PhD students but two to three mandatory seminars need to be undertaken. These serve the purpose of mutual exchange between PhD students through presentations. Progress of the PhD studies is measured once a year on the basis of a 40 to 50 paged report and an oral exam. There is an official and mandatory webpage for PhD students and a Yahoo group intended to foster communication and the exchange of articles and research findings. PhD studies have to last for a minimum duration of three years. In total, approximately 200 PhD students are at present registered at ASE. Up to 74 PhD students and Post-Docs meet weekly within the scope of the Excellence Programme. These students receive a scholarship for their PhD studies. They obtain additional coaching through another supervisor as part of the scholarship. The Excellence Programme fosters the exchange of PhD students through scholarships for a duration of two to four months with an additional financial compensation of approximately 200€ next to the domestic scholarship of about 350€ per month. Next to that, financing for two (mandatory) conference visits domestically and abroad can be obtained. The usual duration of the scholarship is one year.

1.2.3. Designing lectures and courses – basic curricular decisions

Contents

In general, teaching content at FABIZ is organised on the basis of academic texts (e.g. entrepreneurship and strategic management books from Prof. Tanțău) and the individual interests of the respective professors (e.g. strategy and entrepreneurship). The different language tracks at FABIZ in the Bachelor and Master programme are taught by different Professors but their curriculum is approximately 90 per cent identical in terms of the content, the sole difference being its execution in different languages. Further information concerning the content of the specific curricular offers at ASE and FABIZ can be found in the boxes and in the overview table above.

Methods

All entrepreneurial teaching activities at FABIZ are conducted in foreign languages. In this respect, three different educational tracks at Bachelor and Master levels in German, French and English are offered. The English track is most popular among students with approximately 150 participants each year, being followed by the German and French tracks with approximately 70 students respectively each year. In addition, these students are also taught a second foreign language. From 2014 onwards, seven other faculties of ASE will start to offer Bachelor programmes in English. Plans to offer Master programmes in foreign languages at other ASE faculties besides FABIZ are currently being discussed in the areas of informatics, finance, accounting and management. Direct co-operation agreements have been signed with universities in Austria, Belgium, France, Germany, the Netherlands, Sweden and the UK, with a view to facilitating the participation of both students and academic staff members in internships.

- As mentioned above, team-teaching is intensively used as a teaching method at FABIZ. An emphasis is placed on practice-oriented team-teaching where entrepreneurs or business representatives (e.g. from banks) teach courses together with university lecturers. This approach is particularly employed within the “Entrepreneurship and Business Administration in Energy” Master programme. Next to practice-oriented team-teaching, international team-teaching of modules between university professors takes place as well in the scope of the foreign language programmes in English, French and German. Lectures are given by local staff in combination with a foreign lecturer who speaks the mother tongue of the respective language of the programme:

“The UNESCO Chair places one professor, lecturer and in some cases an entrepreneur for each MBA module that has to be taught. Every module will be taught by a German and a Romanian professor or lecturer. This can be seen as knowledge-transfer from Germany to Romania.”

1.2.4. Instructors: teachers and mentors

Professors, other employees and external lecturers of the university

There are different groups of instructors involved in entrepreneurship teaching at ASE including university employees, external lecturers and entrepreneurs (see also section 1.5). Some of the faculty members run their own businesses and/or act as business consultants. Others have a part time job in various professional fields. Regarding the university employees, selection criteria for teaching staff include the scientific or theoretical qualifications and degrees next to practical experience in the field of entrepreneurship.

In this context, it should also be highlighted that engagement in teaching activities oftentimes occurs on a voluntary, unremunerated basis. One example is PhD students who intend to gain teaching experience for an academic career. One interviewed PhD student mentioned that *“teaching was a highly valuable experience and I would like to further deepen my teaching experience in the future at FABIZ”*.

Concerning external instructors, entrepreneurs regularly teach courses together with university lecturers. There are no standardised procedures for the selection of guest speakers for two hours. Such guest speakers are usually entrepreneurs in residence or employees with brands in Romania. Continuous external lecturers generally have to fulfill requirements similar to university professors (i.e. publications, articles, books, research activity, practical experience

and recommendations). As academic qualifications, at minimum a Master degree is required but a PhD is preferred. FABIZ Business Council (see below) is used to invite and recommend guest lecturers.

1.2.5. Management of entrepreneurship education

Teacher and trainer management

With regard to internal instructors, employees are selected according to the minimum norms from the accreditation institutions for assistants, lecturers, senior lecturers and full professors. As an example, an assistant at minimum has to possess a doctor degree and four to six journal publications, in addition to a required active participation in at least two to three international conferences. Evaluations of academic university staff take place at maximum every five years based on their research activity, publications, projects started and completed, book publications, evaluations from students and colleagues, self-evaluation, other contributions and conferences. There is a special department for evaluation at ASE. The intranet is used for evaluation activities where information has to be regularly updated by employees. External training activities for university staff are not required and not funded by ASE unless they are part of specifically acquired funds or projects. Nonetheless, university staff possesses the opportunity to participate in a pedagogical oriented Master in English for free.

Internal and external network management

FABIZ possesses networks dedicated to entrepreneurs and local enterprises. The "FABIZ Business Council" provides support to students with entrepreneurial ideas (see also section 1.3 and 1.5). Prof. Tanțău formed a FABIZ Business Council in October 2013 in order to foster entrepreneurship-related programmes at FABIZ. In this context, a conference for companies within the energy sector was organised with more than 200 participants including representatives from large oil companies, accountancy firms, the president of the World Energy Forum and numerous FABIZ alumni. This conference was targeted at students and experts in the energy sector and served the purpose of promoting the new Master Programme in the Energy Sector at FABIZ (see section 1.2.1). The FABIZ Business Council aims at organizing three events per year that target alumni.

FABIZ involves entrepreneurship graduates into extracurricular activities through its newly created "FABIZ Entrepreneurs Club" (see also section 1.3 and 1.5). FABIZ created this Entrepreneurship Club in 2014 in coordination with its alumni. The alumni network at FABIZ is not yet highly developed due to a lack of financial support. To keep in touch with alumni, an invitation is sent to all alumni for a yearly meeting. One example of an alumnus who has become a successful entrepreneur is Andrei Iovita, CEO of Alta Lingua, a translation firm with revenue of around 3 million Euros in 2013 and 3,5 million in 2014. He holds guest lecturers for students at the university.

According to one interviewee, career perspectives for graduates from FABIZ are good. Main employers of graduates include Romanian commercial banks, oil industry firms, fast consuming goods companies and auditing firms. Around 2 per cent of the graduates become entrepreneurs themselves whereas others find employment in start-ups or companies fostered through networks described above.

Evaluation of courses

Feedback plays an important role at ASE. Next to feedback for students, ASE is highly interested in feedback from students. One interviewed Bachelor student at FABIZ stated that overall he is very pleased with his studies. When asked what could possibly be further improved he mentioned that he would prefer "more practical parts and less theory to get in touch with real entrepreneurs". At present, entrepreneurship education at FABIZ is a mixture of theoretical and practical courses. Students also valued the provision of educational offers in foreign languages as a clear and distinct advantage which makes FABIZ unique. They also pointed out that the professors were very skilled and that the education they received resulted in the development of an entrepreneurial mindset.. Practical experience was gained in the field of entrepreneurship through cooperation with (start-up) companies. Self-employment is oftentimes considered as a career option by ASE students. As one interviewee puts it "*students show strong interest in an entrepreneurial career. They are oftentimes intrinsically motivated to participate in*

entrepreneurship education and particularly enjoy teaching with a strong practical focus". However, in this context, the risks of an entrepreneurial career and the importance of family support and financial resources were also emphasised. Financial restrictions might inhibit entrepreneurial decisions taken by students and entrepreneurship education plays a vital role in addressing the fears and risks associated with an entrepreneurial career.

1.3. Extra-curricular activities related to entrepreneurship education

1.3.1. Overview about extra-curricular entrepreneurship activities

- One important extra-curricular activity in the ASE case study is the Junior Achievement Programme (JAP) in the respective country, as mentioned before. It is a start-up programme where students can present their business ideas at a national competition. Academics from FABIZ strongly encourage participation and integrate the programme into its curricular offers. Moreover, the professors provide start-up counseling and coaching to the students during the project in cooperation with external coaching from entrepreneurs. Thus integrating external stakeholders is a significant part of the JAP. In the past, students of FABIZ have won the JAP and have thereby gained fundamental support in implementing their business ideas (see for more detailed information Box 4 below).

- Besides JAP, there are several other extra-curricular activities to complement the curricular offers and to spread an entrepreneurial mindset across the faculties. A central student organisation named "VIP – Volunteers for Ideas and Projects" unifies three student's clubs and volunteers in a broad range of entrepreneurship topics, from social to commercial entrepreneurship. To expand the internal network of entrepreneurs of the university there is a so-called "FABIZ Entrepreneurs Club" which lists all entrepreneurs to keep track on and in touch with new and established entrepreneurs. With regard to dealing with special entrepreneurial issues and entrepreneurship-related programmes, series of events and lectures are organised by the initiative of the "FABIZ Business Council" (see section 1.2.5) or alternatively held within the "Expand your Horizon"-Conferences. All briefly introduced extra-curricular activities are shown in the following exhibit 2:

Exhibit 2: Overview about extra-curricular entrepreneurship education activities at the Bucharest University of Economic Studies

No.	Name	Objectives	Target group	Offered since [year]	No. of participants in [year]
1	Junior Achievement Programme (JAP)	Action oriented start-up programme for creating potential products and services for customers, provides coaching in writing a business plan and in launching successful pilot projects, no funding, but the opportunity to participate in competitions e.g. "JA-YE Europe Company of the year Competition"	Students	NA	NA
2	VIP – Volunteers for Ideas and Projects	A student organisation aiming at contributing to society with several projects, conferences and debates. Three communities are united in this Student's club: Leadership Development (for personal development), Business Club ("for wannabe entrepreneurs"), and Econosofia (for those interested in macroeconomics).	All Students who are interested in gaining hands-on experiences	12 years	NA
3	FABIZ Entrepreneurs Club	List of members and description of their businesses, as well as job offerings are available online for networking purposes and to state the development of the start-up business. This Entrepreneurs Club is	Founder, Entrepreneurs	NA	6 [2014]

		new established and in the process of developing.			
4	FABIZ Business Council	Organisation of entrepreneurship-related programmes and a series of events to support students with entrepreneurial ideas and to keep in touch with alumni	Students, Alumni, Entrepreneurs	2013	NA
5	"Expand your Horizon" Conferences	Guest presentation and lectures of experts for an insight in the business environment e.g. "Romania Entrepreneurship culture and local business"	Students, Alumni and Faculty Members of the Bucharest Business School	2015	NA

Box 4: Junior Achievement Programme

Junior Achievement Programme (JAP)

"JAP worldwide" is the largest organisation promoting entrepreneurial key concepts for young adults which shall be individually adapted by different education institutions. The so-called Junior Achievement Programme (JAP) is a competitive Start-Up Programme with regard to entrepreneurship education ideas. Integrated as part of the curricular *and* extra-curricular activities at FABIZ, this programme provides new business venture coaching and encourages students to convert business ideas into action. On top, since 1993 Romania implements didactical approaches and guidelines of JAP in schools across the country in terms of lifelong learning (see: <http://www.jaromania.org/>).

Target group

JAP is open to students from all faculties who are interested in Entrepreneurship. Participation in JAP can be integrated into curricular offers at FABIZ.

Programme design and Setting

The programme's experiential learning design "learning by doing" aims to prepare participants for real global marketplace challenges and helps them to acquire essential entrepreneurial skills by offering professional support in e.g. writing business plans or in launching successful pilot projects to real customers. Guidebooks published by *JAP worldwide* are used for structuring the course.

During the time of the project, JAP participants from FABIZ receive, in general, start-up counseling and coaching from Prof. Tanțău and two coaches from JAP and EY. There is no funding available, but the opportunity to participate in competitions such as the "JA-YE Europe Company of the year Competition" (see: <http://www.ja-ye.org/>).

The participation in international competitions is not compulsory for students. If the students nonetheless decide to participate they receive bonus points as an incentive as well as a participation certificate. Students can additionally choose to participate in the JAP competition several times if desired. Furthermore, the preparation of the business plan for the competition is integrated into the curricular fixed Entrepreneurship Culture course (see section 1.2).

Persons involved

Academics from FABIZ strongly encourage inter-faculty participation and integrate parts of the programme into its curricular offers. Moreover, the professors provide start-up counseling and coaching to the students during the project in cooperation with external coaching from entrepreneurs to engage external stakeholders in the process.

1.4. Institutional aspects of entrepreneurship education

1.4.1. Organisational set-up and change

Measures for coordinating and integrating entrepreneurship education across the university

ASE does not possess a staffed department or centre for entrepreneurship. Instead, it offers individual courses in entrepreneurship. As described above, most entrepreneurship offers are initiated by FABIZ. Additional entrepreneurship courses are offered at the Bucharest Business School and the Faculties of Business and Tourism (formerly Commerce) of ASE (see section 1.2.1). These faculties work independently without a coordination entity for entrepreneurship. Instead, faculties compete for the decreasing numbers of students. ASE possesses around 24,000 students at present with numbers decreasing year by year while FABIZ currently has 1300 students with a yearly decrease of 8% (in 2014-2015 FABIZ has no decrease).

There are, however, business councils at the level of each faculty, which are involved in curricular development and related activities such as conferences or projects. ASE frequently organises events of public interest in collaboration with external stakeholders (see section 1.5).

Influence of external stakeholders in the entrepreneurship education programmes

Due to a series of meetings and debates among professionals, external stakeholders do have an influence in entrepreneurship education programmes. The course content of the Master programmes is coordinated with stakeholder expectations to properly tailor educational offers in order to meet the needs of the Romanian business environment.

1.4.2. Laws, statutes and codes

Incentives for staff to engage in or support entrepreneurship education

No laws, statutes or codes that serve as incentives for staff to engage in entrepreneurship education could be identified. One interviewee stressed that staff engages in entrepreneurship education solely as a hobby or passion through intrinsic motivation. There is also a law that prohibits employment for PhD students at the university until the end of their studies, which causes voluntary unpaid teaching engagement of PhD students who want to pursue an academic career (see section 1.2.5). For PhD students, only Bachelor courses are allowed to be taught. Furthermore, there are also internal requirements for university employees in terms of the teaching conditions (e.g. amount of teaching hours) at ASE.

1.4.3. Mindsets and attitudes

Raising awareness for the importance of entrepreneurship

The employees of ASE are highly aware of the importance of entrepreneurship. Together with the University of Brasov, FABIZ promotes entrepreneurship through an "International Conference on Business Excellence" that rotates between Bucharest and Brasov each year. Within this conference, a business session is specifically dedicated to entrepreneurship and education in which CEOs highlight the skills and qualifications they desire from students.

Encouraging entrepreneurial behaviour

There are currently no explicit incentives stated that encourage entrepreneurial activities and behaviour from students or staff at ASE.

1.5. External relationships related to entrepreneurship education

1.5.1. External stakeholders involved in entrepreneurship education

FABIZ engages in relationships related to entrepreneurship education with numerous stakeholders. The most important stakeholders are the enterprises, including the CEOs from the FABIZ Business Club (see section 1.2.5). Other stakeholder groups encompass professional associations and non-governmental and student organisations. At present, there are no business support services, incubators or accelerators at ASE or FABIZ.

Enterprises

At ASE and FABIZ, numerous enterprises show an interest in collaborating with students. Examples of the type of involvement of entrepreneurs in entrepreneurship education are guest speeches (e.g. entrepreneurial skills and business consulting), lectures and key note speeches

as well as cooperation through trainings, workshops, summer schools, events, projects and internships. FABIZ organises regular business events for students which provide networking opportunities with entrepreneurs. Concerning future plans, employees from FABIZ have pointed out that they intend to extend their partnerships with enterprises.

To manage its partnerships with enterprises on a university level, ASE possesses a Vice Rector for internal institutional relationships with the business environment. This establishment shall, for instance, ensure that there is at least one internship project for students in cooperation with the business sector in each of ASE's faculties. Moreover, it enables a framework for cooperation between the university and the business sector. Whereas active partnerships with enterprises are generally established at the department or faculty level, the Vice Rector also signs official agreements at the university level.

Other stakeholders

Further stakeholder groups related to entrepreneurship education include professional associations and non-governmental and student organisations.

Most faculties of ASE have professional associations and/or non-governmental organisations at the faculty level. However, there exists is also an association at the university level. ASE foundation was created to help the staff in running different programmes and projects as well as to avoid bureaucracy since it requires less approval than on a faculty basis. These foundations can support entrepreneurship education through the provision of networks and infrastructure and through their reputation as a promoting factor.

Student organisations obtain support from the university mainly through the provision of a location in a separate university building dedicated to student organisations. At present there are eleven student organisations hosted by ASE. Executed projects aim at raising money for workshops and training.

1.5.2. International relationships

International relationships are of utmost importance to ASE in general and FABIZ in particular. A separate entity of the university exists, which deals with managing and extending relationships with stakeholders of the socio-economic environment. A Vice Rector for international relations is particularly assigned for this task in order to manage the university's inter-institutional relationships and partnerships with its socio-economic environment. Further responsibilities include the negotiation of international cooperation agreements and the communication with different institutions or embassies related to mobility. Each of ASE's twelve faculties possesses a correspondent Vice Dean who serves as a contact person for international relationships at the faculty level. On the whole, international relationships related to student mobility are mostly organised via centralised procedures on a university level.

ASE possesses an extensive network of partner universities around the globe. International partner universities of FABIZ are located in countries such as Germany (e.g. Wuppertal, Trier, Passau, Reutlingen, Gelsenkirchen, Bochum), Switzerland (e.g. Bern), Austria (e.g. Klagenfurt, Vienna) and France (e.g. Paris, Nantes).

ASE engages in various exchange programmes, such as Erasmus or the POSPRU Programme. On a yearly basis, approximately 100 incoming students and 400 outgoing students are registered. Around 99 per cent of the incoming and 40 per cent of the outgoing exchange students have ties with FABIZ or alternatively, the International Business and Economics Faculty. The most popular countries for outgoing students are European countries such as France, Germany, Austria, the Netherlands, Norway, Spain or Portugal. Frequently exchange students undertake entrepreneurship courses at ASE or abroad at the respective partner universities.

ASE plans to expand its international relationships even further and promotes internationality. Internationality is a priority of the current Dean with a targeted focus on international mobility projects, international publications, international study programmes and international staff. Internationality is formally included as part of the assessment of teachers through a change in the Romanian legislation where teachers receive points for membership in international associations or for becoming a visiting scholar. Concerning the international mobility, the

university's objective is that 20 per cent of the students participate in international mobility programmes, which implies a significant growth from 5 per cent at present.

ASE has acquired close to 50 new partner university agreements recently. Nonetheless, funding restrictions were mentioned as a severe challenge for the growth of the mobility programme due to its fundamental dependence on the availability of financial resources. Of the 400 outgoing students per year, less than 10 were self-funded while the remainder was funded by third-parties via grants or scholarships. Funds are received on the basis of past performance, which implies that with growing exchange student numbers, the same funding level as in the past years does not cover all necessary expenses. Further forms of funding are provided via the Erasmus funding established by the European Commission as well as through the Ministry of Education of the Romanian government.

1.6. Lessons learned

ASE faces several challenges with regard to limited institutional coordination, administrative and bureaucratic hurdles as well as restrictive financial resources. Additionally, the number of students in Romania has been decreasing for years, which intensifies the pressure on university staff because funding is dependent on the number of students. Most universities are struggling to survive financially due to limited governmental funds and support next to declining student numbers. As a result, fierce competition, both at the university level between the distinct business faculties and at the national level between the different universities (e.g. University of Bucharest, National School of Political Science and Public Administration), can be observed.

All these factors severely influence the way that entrepreneurship education is designed with the aim of creating a unique approach in order to distinguish itself from competing offers and to sustain one's existence over the long run. These challenges highlight the importance of governmental as well as the university's financial and mental support for the provision of entrepreneurship education. Moreover, support from other external stakeholders, such as alumni or companies, is crucial for the continuous provision of entrepreneurship education, especially funds, which are severely restricted. This case study reveals that the regional and national context is of utmost importance and exerts a substantial influence on entrepreneurship education through its embeddedness in the environment.

- A further lesson learned is the fact that promoters can play a crucial role in the provision of entrepreneurship education at HEIs. Prof. Tanțău, Dean of FABIZ, serves as an example of a strong promoter for the integration of entrepreneurship into the teaching offers and curricula at his faculty. Such individuals can shape the orientation of universities by promoting causes and aspects that are of personal importance, which is in this case study, the profound integration and prioritisation of entrepreneurship education at FABIZ and ASE.
- Ultimately, this case study also reveals that it is important for universities to pursue a differentiation strategy in order to distinguish itself from other universities if competition over students is fierce. ASE does so by continuously innovating its approach towards entrepreneurship education. Within FABIZ, curricular offers are exclusively provided in foreign languages with deep embedment of (inter)national team-teaching approaches between academics, and practitioners. FABIZ aims to diversify its activities through an international orientation. A novel Master programme has further been created in response to the business need to specifically prepare students for an (inter)national career as entrepreneurs or intrapreneurs in the energy sector.

List of Abbreviations

ASE	Bucharest University of Economic Studies
FABIZ	Faculty of Business Administration in Foreign Languages
JAP	Junior Achievement Programme

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Research for this case study was conducted by Kathrin Bischoff, Research Associate at the University of Wuppertal, on behalf of the study for supporting the entrepreneurial potential of

higher education (sepHE) with support from Dana Denzer, Research Assistant at the University of Wuppertal. Sources and references used include desk research plus:

Interviews

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- Prof. Carmen Paunescus, Professor at the Faculty of Business Administration in Foreign Languages, Bucharest University of Economic Studies, interviewed on the 26th of June, 2014 at FABIZ
- Alexandru Christache, Bachelor Student at the Faculty of Business Administration in Foreign Languages, Bucharest University of Economic Studies, interviewed on the 26th of June, 2014 at FABIZ
- Roxana Clodnitki, PhD Student and Alumni at the Faculty of Business Administration in Foreign Languages, Bucharest University of Economic Studies, interviewed on the 26th of June, 2014 at FABIZ
- Maria Nichifor, PhD Student and Alumni at the Faculty of Business Administration in Foreign Languages, Bucharest University of Economic Studies, interviewed on the 27th of June, 2014 and the 3rd of July, 2014 at FABIZ
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2. University of Cambridge, United Kingdom: Persistently innovating entrepreneurship education methods

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Abstract



The main focus in the case study of the University of Cambridge (UC) is set on its Centre for Entrepreneurial Learning (CfEL). CfEL's mission is to spread the spirit of enterprise and this mission is deeply embedded in its approach to entrepreneurship education. CfEL offers a broad variety of innovative educational programmes, such as the Postgraduate Diploma in Entrepreneurship (PGDE), Enterprise Tuesday (ET), Ignite or EnterpriseWISE. In terms of methods, predominately practice-oriented teaching is employed, for instance through business plan seminars or applied case studies. CfEL further emphasises the importance of networks and collaboration, be it in its curricular or its extra-curricular activities. Entrepreneurs in residence and visiting entrepreneurs are strongly integrated into entrepreneurial teaching as lecturers, mentors, coaches or facilitators. CfEL also focuses on collaborating with students in order to consider their needs and demands in educational planning.

Case study fact sheet

<ul style="list-style-type: none"> Full name of the university and location: 	University of Cambridge (UC), Cambridge, United Kingdom
<ul style="list-style-type: none"> Legal status of the University of Cambridge: 	Collegiate Public Research University with 31 constituent colleges and more than 100 academic departments organised into six Schools
<ul style="list-style-type: none"> Location of the University of Cambridge: 	Cambridge, United Kingdom
<ul style="list-style-type: none"> Year of foundation: 	1209
<ul style="list-style-type: none"> Number of students at the University of Cambridge and its 31 Colleges: 	Undergraduate students in 2012/2013: 11,820 students Postgraduate students (Masters) in 2012/2013: 2,620 students Postgraduate students (Doctorate) in 2012/2013: 3,831 students Total number of students in 2012/2013: 18,271 students
<ul style="list-style-type: none"> Number of employees at the University of Cambridge : 	Academic staff in 2013: 1,616 employees Academic related staff in 2013: 1,559 employees Contract research staff in 2013: 3,470 employees Technical staff in 2013: 1,149 employees Clerical and secretarial staff in 2013: 1,601 employees Manual and domestic staff in 2013: 428 employees Total staff in 2013: 9,823 employees
<ul style="list-style-type: none"> Budget of the University of Cambridge: 	Total income in 2012/2013: £905,369,000 Total expenditure in 2012/2013: £874,055,000 Total funds in 2012/2013: £2,628,300
<ul style="list-style-type: none"> Academic profile of the University of Cambridge: 	Cambridge is at the international forefront of excellence in teaching and research as evaluated by different university rankings.
<ul style="list-style-type: none"> Entrepreneurial profile of the Centre for Entrepreneurial Learning (CfEL): 	CfEL is a UC institution and part of Judge Business School (JBS). It directly focuses on entrepreneurship education. CfEL aims at spreading the spirit of enterprise to both the UC community and to wider

	<i>national and international audiences.</i>
▪ <i>Activities focused in this case study:</i>	<i>Mainly extra-curricular entrepreneurship education activities, such as the Enterprise Tuesday, ETECH, Ignite and Enterprisers.</i>
▪ <i>Case contact persons:</i>	<i>Prof. Shailendra Vyakarnam, former Director of CfEL; Yupar Myint, MBA, Ignite Programme Director and Director of International Development, CfEL; Dr. Joanna Mills, Programme Director of the PGDE and Deputy Director of CfEL.</i>

Information included in this case study is from end of year 2014 unless stated differently.

2.1. The university’s entrepreneurial profile

2.1.1. The university’s overall approach to entrepreneurship education

Entrepreneurship is integrated in the local culture with Cambridge being home to 1,500 high-tech companies out of which up to one third were formed as a result of UC. The Cambridge region is well known for its thriving entrepreneurial ecosystem, also referred to as ‘Silicon Fen’. It features a supportive environment for innovative and high growth start-ups. The Hauser Forum (see: <http://www.hauserforum.com/>) serves as an excellent example for stimulating collaboration between clusters of academics, start-up and established businesses. It offers office space and resources for tenants such as *Cambridge Enterprise* and *ideaSpace* who enable entrepreneurs to work on their research commercialisation activities in cooperation with University staff.

The main institution responsible for entrepreneurship education at the University of Cambridge (UC) is the Centre for Entrepreneurial Learning (CfEL) whose teaching activities will therefore be the focus of this case study. CfEL is part of the Cambridge Judge Business School (CJBS). A precursor of CfEL for entrepreneurial learning in Cambridge was the Cambridge Entrepreneurship Centre (CEC). Three of the key programmes of CEC were Enterprise Tuesday (ET), Ignite and the Business Creation Competition (BCC). ET and Ignite are nowadays offered by CfEL while BCC is offered by Cambridge University Entrepreneurs (CUE). BCC and Ignite – the latter of which was formed as a result of a summer school – were already created before CEC was formed as a result of a competition for funding from the British government to set up an Entrepreneurship Centre. These programmes have helped to raise the profile of entrepreneurship and CEC (and later on CfEL) within the university. They have also resulted in national and international recognition and an enormous development and increased prioritization of entrepreneurship education in Cambridge over time.

While activities already started in 2000, CfEL was officially launched on September 1, 2003 with a mission to "spread the spirit of enterprise to both the University of Cambridge community and to wider national and international audiences through the creation and delivery of a range of educational activities that inspire and build skills in the practise of Entrepreneurship". Since its launch, the centre has run many successful programmes, including the popular ET lectures and numerous networking events. Over time the amount of entrepreneurship education activities offered in Cambridge has expanded and spread. Further flagship programmes of CfEL encompass the ETECH Programme, Ignite, Enterprisers and the Postgraduate Diploma in Entrepreneurship (PGDE) which was the first certified entrepreneurship education offer of its kind. One current project is the launch of a charter that is developed in cooperation with real entrepreneurs in order to provide aspiring entrepreneurs with examples of best practice start-up cases. The main role of CfEL is to evangelize and promote entrepreneurship education, to provide skills and to bring people together. Peculiarities of entrepreneurship education at CfEL include its practitioner-led education *for* and *through* entrepreneurship, its ‘learning journey approach’ for positioning oneself and the values related to its way of working (e.g. pro-bono teaching, the belief that entrepreneurship can be trained and skilled, the value of social capital and networks).

2.1.2. Leadership and governance

Importance of government strategies

The government of the United Kingdom represents an important funding source for entrepreneurship education, for instance through the Higher Education Innovation Fund where each university receives substantial funds to distribute among its schools and institutes (see: <http://www.hefce.ac.uk/whatwedo/kes/heif/>). From these funds, CfEL currently obtains £300,000.

The starting point for CfEL was in 2001 when 12 universities in the United Kingdom were tasked by the government to support entrepreneurship education with Science Enterprise Challenge funding. The idea was to initiate change in universities which is more favourable for entrepreneurship education. The goal was to reach out to students. Entrepreneurship should no longer solely be on top of existing studies next to other courses but should be deeply integrated into education in Cambridge through curricular offers for undergraduates and extra-curricular offers for postgraduates. To implement these extra-curricular activities, a cultural change (i.e. a change of mindsets) was needed (see section 1.4.3). Cambridge Enterprise and the Cambridge ecosystem were supporting commercialization strategies of start-up companies. As a result, a broad portfolio of extra-curricular and curricular offers was established (see section 1.2 and 1.3). All of these offers were highly innovative when initiated.

Concerning the prioritization of entrepreneurship education, governments were extremely interested in economic development as well as economic and social impact measurement of education. As a consequence, universities were to become more aware of the need to equip graduates with real life skills which can partially be taught through entrepreneurship education.

Importance of entrepreneurship in the university's strategy

Entrepreneurship and entrepreneurship education have gradually become more important at UC. This increase in importance evolved as a mixture of bottom-up and top-down initiatives on entrepreneurship education. In the beginning of the new millennium, there were, as one interviewee said, "low-level, department-focused pockets of happening". The CEC by then offered a limited number of courses that were directed at particular types of people, such as graduates, summer school participants or physics students. As teaching methods, traditional academic, lecture-based courses and workshops were provided in contrast to real-action learning. There was initially an element of resistance back in the days of including entrepreneurship as part of the university curriculum. There was also resistance in the early days to a practice-based entrepreneurship education since Cambridge is a very traditional university that preferred to focus more on training academics and not practitioners, such as entrepreneurs.

Nowadays, the number of people involved in entrepreneurship-related activities at the university has strongly increased, which is aided by the fact that the current Dean of CJBS, Christoph Loch, has revealed a strong commitment to entrepreneurship and one interviewee mentioned accordingly that "entrepreneurship education is high on the agenda of the JBS". Next to that, a termly meeting of everyone involved in entrepreneurship education at UC (including among others Cambridge Enterprise, Institute for Manufacturing, professors, lecturers and researchers) is arranged and chaired by Stew McTavish of Ideospace as part of the University Enterprise Network.

Although entrepreneurship education evolved in the years with its activities widening and deepening, it should nonetheless be pointed out that there no details on official goals or written statements on entrepreneurship education at the university level could be identified. In contrast, CfEL, Ideospace and Cambridge Enterprise clearly articulate a vision and values related to entrepreneurship on their public profile.

Level of faculties' and units' autonomy to act

Entrepreneurship education at CfEL and the related university institutions, such as student led initiatives as for instance CUE, CUIF or CUTEC, is on the whole organised in a radiant and thus decentralised approach. CfEL is able to design its entrepreneurship education portfolio mostly autonomously, especially with regard to its extra-curricular activities. In terms of the curricular offers (i.e. PGDE and the revised ETECH programme), stronger coordination with UC is needed due to the fact that these offers are certified (see section 1.4).

For the curricular offers, formal quality assurance procedures are required. In terms of the PGDE, quality assurance for certified programmes implies that a teaching and admissions committee and an examination committee are established. The teaching and admissions committee consists of all involved teachers, a CJBS representative as chair and a student representative. It meets once per term with a total of three times a year. During its meetings it reviews prior to teaching and prepares upcoming teaching activities. Moreover, administrative and resource-related matters are discussed as well as general changes which influence the teaching context. The examination committee is composed of internal CfEL staff, a CJBS representative as chair, an external examiner from another university and two observers. It meets once a year and thereby assesses who gets approved for the marking of assignments. The marks provided in turn need to get approved by the chair of examiners (see section 1.2.6).

University's importance for driving entrepreneurship in its environment

Cambridge is located in a highly innovative region with a magnitude of start-ups. These start-ups are mostly created in the area of life science and technology. Entrepreneurship and enterprises in Cambridge are high profile in the media and government. Substantial importance of the UC for driving entrepreneurship in its environment can be noted and numerous successful start-ups have been created from UC alumni (see section 1.4).

2.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

Attracting highly qualified staff is essential at UC and at CfEL. The strong reputation of the university helps in attracting suitable personnel despite the fact that salaries for academics at UC are at a moderate level. In attracting people, shared values and enthusiasm are desired. Backgrounds of individuals involved in entrepreneurship education vary although a common interest and prior experience in the field of entrepreneurship can generally be observed.

Financial resources for entrepreneurship education

It was highlighted by numerous interviewees that sufficient financial resources are essential for a stable and long-term provision of entrepreneurship education. The continuity of funds is in particular important in order to engage in long-term planning of entrepreneurship education. CfEL possesses a total of £1,000,000 a year as budget which covers CfEL's expenses and enables the provision of a diversified range of educational offers free of cost to the University's departments. Out of this budget £300,000 a year originate from HEIF while the remainder stems from income generated through course fees, projects and other sources, such as sponsors.

The CfEL customised entrepreneurship programmes can be considered as the examples for project fee income generation at UC. Extracurricular programmes are conducted in Cambridge and target undergraduate students, entrepreneurs and researchers from overseas universities and public institutions with a focus on building entrepreneurial mindsets and capabilities and commercialisation of research. Besides building the skills and providing the insights about the practices and ecosystem in Cambridge it also serves UC's vision of spreading the entrepreneurial spirit through its outreach.

2.2. Entrepreneurship in curricula and teaching

2.2.1. Overview about curricular offers

At present, CfEL focuses on hands-on, extra-curricular entrepreneurship education to pursue its practice oriented approach. Consequently, CfEL solely provides two accredited offers: ETECH Projects programme and the Postgraduate Diploma (PGDE) which are based within CJBS. These two offers have different target groups and varying objectives. While ETECH is focused on delivering inside the university to students doing other courses, PGDE is an outreach type programme not open to current students of other disciplines within UC and it also charges a fee.

It should be pointed out that at the time the interviews were being conducted; CfEL was in the process of restructuring the ETECH programme. Hence, the content and design of the programme is constantly adjusted according to the context it is offered in and the respective

requirements for accreditation. For further information on the ETECH programme and its undergoing changes please see the box below.

Since its inception, the PGDE has also developed in a substantial manner. It was initiated in 2006 with formal approval being granted in 2008. The programme began as an Advanced Diploma in Entrepreneurship and as a partnership activity with the Institute of Continuing Education in 2009 with 9 students. Over the years PGDE was moved into the CJBS as a certified programme and an award for non-members of the university. Due to its unique teaching approach, this section will focus on the PGDE (for further information see: <http://www.jbs.cam.ac.uk/entrepreneurship/postgraduate-diploma-in-entrepreneurship/>).

The process of entrepreneurial learning at CfEL is depicted as a so-called “entrepreneurial journey” (see Exhibit 1-1 below). CfEL has established a portfolio of curricular and extra-curricular offers that address individuals on different points on this learning journey. Next to the programmes described in Exhibit 0-1 below, customised programmes could be included in addition, such as short term lectures and workshops, mentoring and project work on start-ups. The programmes encompass early stages of entrepreneurship, such as the establishment of an entrepreneurial mindset and confidence in entrepreneurship. Advanced stages are taken into account with the provision of tools for assessing feasibility of projects and eventually by support in incubating the business idea. The following figure only displays the programmes run by CfEL (see also section 1.3 for the extra-curricular offers) while additional (extra-curricular) programmes of UC and its ecosystem will be displayed in section 1.3. The ETECH Projects Programme is situated at an intermediate stage within the entrepreneurial journey whereas the PGDE spans across the different stages of the journey.

Exhibit 2-1: Entrepreneurship Journey Map (Source: CfEL Annual Review, 2011)

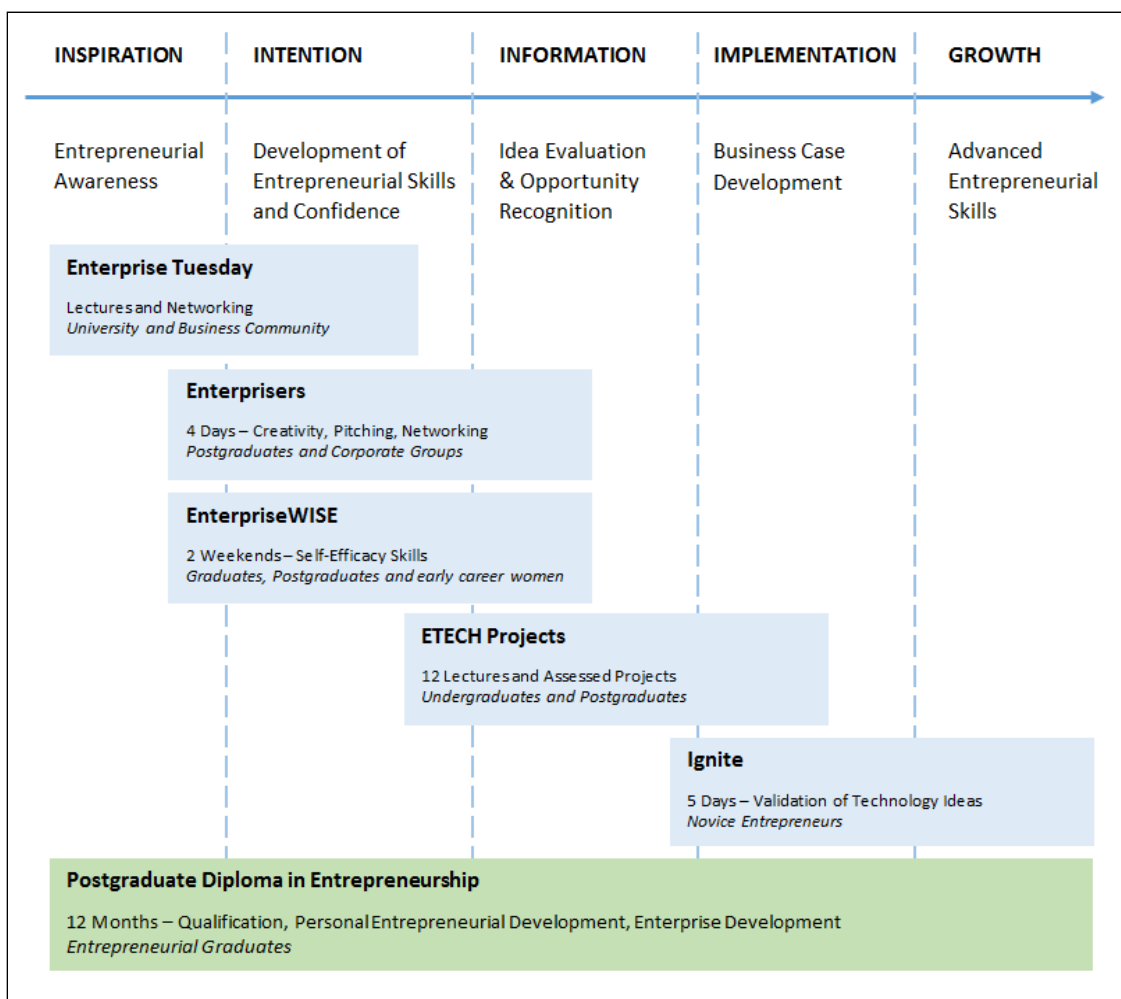


Exhibit 2-2: Overview of curricular entrepreneurship education offers at CfEL

No.	Name	Objectives	Target group	Offered since	Maximum no. of participants per year
1	ETECH Programme	Generate a theoretical understanding of commercialization in entrepreneurship of emergent technologies.	Undergraduate students, graduate students in MBA, PhD students, interdisciplinary.	2001	Approx. 50
2	Postgraduate Diploma in Entrepreneurship	Developing academic skills, self-reflection skills and practical entrepreneurial skills.	Postgraduates	2009	Currently 40

Box 1: ETECH Programme

ETECH Programme

The ETECH Programme accelerates entrepreneurship in emerging technologies and aims at diffusing innovations and high potential technologies from UC. The programme is conducted within credit bearing courses at several University departments such as Natural Sciences, Technology and Biological Sciences. Since 2009, almost 100 ETECH projects resulted in the evaluation of over 50 novel technologies that have been worked on by approximately 500 students and about 30 inventors.

There is a current development at CfEL to revise the ETECH programme as an offer for Research Master Students. The revised programme will be provided for the first time at the end of 2014 shortly after the interviews for this case study were conducted. It serves as a trial which, if successful, will be replicated in the years to come (see: <http://www.cfel.jbs.cam.ac.uk/programmes/etech/index.html>).

Target group

ETECH Projects are part of several degree programmes within the Schools of Technology, Natural Sciences, Physical Sciences and Biological and Biomedical Sciences. The programme targets undergraduate as well as postgraduate students including the MBA and EMBA programmes. The undergraduate variant is provided as assessed service teaching whereas the graduate variants are optional. It is compulsory in the Research Master programme as part of PhD training in sensotechnology. What is more, an assessed course has recently been developed within the Doctoral Training Centres as part of PhD studies in about 7 subject areas. The target audience is therefore interdisciplinary and addresses different levels of study. It is estimated that around 50 students will participate in the programme. Students are selected through a competitive process by six centers involved. The programme is considered necessary for engineers as it helps developing visions through a multidisciplinary effort and constant development.

Programme design

The goal of the programme is to generate a theoretical understanding of commercialization in entrepreneurship of emergent technologies. Thereby, students learn and apply entrepreneurial skills within specific projects in teams. Attention is paid to close collaboration with industrial partners to create a real-life focus. The programme requires a high level of confidentiality due to the early stage of the technologies. Therefore, the students' work is covered by Non-Disclosure Agreements in order to ensure the protection of Intellectual Property. The programme is financed by the British Engineering and Physical Science Research Council UK and the British government.

Teaching methods include academic and practitioner-led lectures with hand-on sessions, technology simulations, debates with real entrepreneurs, pitching sessions in front of investors and feasibility reports developed in team work. Furthermore, supervision and support as well as tools for opportunity evaluation and developing business concepts are provided. The pitching sessions and the feasibility report serve as main assignments of the course.

In terms of the grading, students get evaluated on the basis of their participation, their ability to pitch successfully and the feasibility of their projects.

Setting

The curriculum of the course is currently being designed and adjusted to the new curricular, PhD setting. The course shall take place over a period of approximately three months from December 2014 to March 2015 with a five-day presence in the beginning and a three-day presence in the end.

Persons involved

University lecturers and entrepreneurs serve as instructors throughout the course. Moreover, facilitation sessions in groups are employed.

2.2.2. Target groups

Main target groups of entrepreneurship education

The target audience of the PGDE includes fresh graduates with first working experience as well as graduates with three to five years experience who are in the process of becoming entrepreneurs. What is more, senior participants with vast amount of work or entrepreneurial experience, such as business professionals wanting to start their own ventures, entrepreneurs with early stage ventures or intrapreneurs are also encouraged to participate in the PGDE. All participants will be working on their own entrepreneurial projects throughout the course of the programme in order to ultimately implement their projects.

"The application process for the PGDE was straightforward and efficient and staff was very responsive" (Simon Daly, PGDE alumni).

The first selection criterion for the admission process in the PGDE is a 2:1 grade or better. These applicants are in turn invited to a personal interview. This semi-structured interview serves as a dual assessment: First, it is assessed, whether the applicant qualifies for the PGDE and if so, whether he will benefit from the PGDE. Second, it is assessed, whether other participants of the PGDE would benefit from the applicant. Hence, an applicant must be willing to share his thoughts, ideas and experience to foster mutual learning. Other important criteria for the selection process include the extensiveness of prior industry experience, the amount of previous involvement in entrepreneurial activity, the potential of the proposed business idea as well as the motivation and personality of the applicant. The number of participants in the PGDE depends on the number of qualified applicants with no automatic cap being applied. At present the maximum number of PGDE participants has been 40 (see exhibit 1 above). The PGDE (and other CfEL offers) are marketed through links on Master Studies (www.masterstudies.com), via prospective magazines for graduates and through the alumni network and also through a range of online marketing activities.

2.2.3. Designing lectures and courses – basic curricular decisions

Intentions

The PGDE is a journey. It aims at developing the participants' practical skills and knowledge for successful entrepreneurship. The (personal) learning objective of the PGDE, as perceived by an alumnus, was to facilitate a greater understanding of entrepreneurship, to raise profile in entrepreneurship education and to create a strategic fit with personal interests and job opportunities. Although all participants were generally interested in entrepreneurship, their concrete intentions of the participants did vary: Some students were aiming at acquiring the skills needed to become an entrepreneur and were looking for recommendations and support for enterprising people to take the next steps; other were already entrepreneurs and needed help in developing their business while the remaining students were involved in entrepreneurship education and were aiming at developing their entrepreneurship teaching approaches.

Contents

The PGDE is a part-time programme that consists of four courses in total. At the beginning of the programme each participant selects one entrepreneurial idea as a business project which he

prepares to implement throughout the programme. The first one is a course on “Entrepreneurial Awareness and Skills” which provides a basic general knowledge of entrepreneurship and which familiarises the students with the used technology and theory. The second course is on “Opportunity Recognition and Idea Evaluation” in order to get the students through a feasibility study thinking about opportunities and to provide them with the knowledge to transform their own project ideas into opportunities. The third course is called “Preparing and Implementing the Business Case” where students put down their business models into words to create their individual business cases, for instance with regard to the chosen approach to financing or the market entry strategy. The fourth and last course of the PGDE focuses on “Managing the Early Enterprise” and discusses aspects, such as legal structures, shareholder and stakeholder relations, partnerships and employee roles.

Methods and Media

Throughout the PGDE, various teaching methods are employed, including traditional lectures, readings, videos, discussions and regular (phone) meetings with the respective mentors and tutors. Next to presence-based learning, e-learning via the virtual learning environment (VLE) is a central component of the PGDE (see section 1.2.4).

Using results of entrepreneurship research

The results of entrepreneurship research are mainly included in entrepreneurship education through readings and presentations where relevant findings of entrepreneurship research are brought forward to facilitate understanding of the theoretical basis of entrepreneurship.

2.2.4. Setting of entrepreneurship teaching

Locations and Timing

At CfEL, a blended approach to teaching entrepreneurship is employed. Traditional, presence based learning is combined with e-learning. Presence-based entrepreneurship education at CfEL takes place at the university in lecture halls or tutorial rooms. This VLE is a central e-learning component of programmes like the PGDE or ETECH. In the PGDE, online platforms such as MOODLE are used. Their usage differs on a course-to-course basis to tailor the VLE to the respective educational needs and approaches. This online environment is used for communication and discussions in groups and to upload pre-course material. The discussion of the students in the e-learning environment is assessed for the grading in all four PGD courses as an incentive for increased online participation. Taped video lectures given by entrepreneurs or interviews are also uploaded on the VLE, for example from ET or ETECH (see section 1.3).

The PGDE is a year-long programme which starts end of August or beginning of September and ends around that time in the upcoming year. Within this year two residential periods take place with one week at the beginning of the programme and two more weeks in spring. Throughout the remainder of the year, all teaching activities are organised via the VLE. In the PGDE, there are blocks of learning between 5 and 7 weeks with contributions within weekly time frames. The VLE provides an overview of the key objectives and desired learning outcomes per week. In terms of the design of the lessons in the VLE, the overview is broadly equivalent to a 90-120 minute lecture with a faculty member. These lessons are text-based with a reading list of core and additional readings and include a series of linked webpages and links to the library.

Formal evaluation of learning outcomes

In the PGDE, participants get evaluated by a variety of assignments, including end of course exams, online participation at the VLE, reflective journals, academic essays, oral presentations and the development of the enterprise projects. Next to the obligatory assignments, weekly voluntary, non-credited assignments are also offered for the students to obtain preliminary feedback. In addition to the assessment by the tutors, peers are additionally assessing one another. One unique aspect about the PGDE is the unique group spirit created with a supportive, shared and open culture and regular peer-to-peer feedback.

2.2.5. Instructors: teachers and mentors

Professors, other employees and external lecturers of the university

Academic instructors in the PGDE are usually employees from the CfEL or the CJBS on the whole as course coordinators, lecturers, tutors or facilitators. Hereby, a separation should be made between staff that design and administer courses. Employees at CfEL are highly qualified. Academic staff generally possess a PhD and/or MBA in a diversity of fields, including entrepreneurship, business administration, anthropology, bioscience and engineering. Administrative staff is well qualified with more than 20 years of work experience.

"Real entrepreneurs" as teachers

At the PGDE, real entrepreneurs are invited as guest speakers during the residential periods. Entrepreneurs are further involved in the organised (social) activities, networking events and excursions, such as company visits or negotiation exercises. These entrepreneurs are on the whole highly experienced and successful. Their involvement in entrepreneurship education (e.g. as lecturers or mentors) is described in more detail in section 1.5.

Mentors

Each student has a mentor and a tutor in the PGDE. For the mentoring, students form a group of four to six members and each group is assigned one mentor on a long-term-basis during the entire programme duration of one year. On average, mentoring sessions take place every two weeks with the frequency being adjusted to the mentees' needs. These mentoring sessions are undertaken both on a group and an individual level and on a face-to-face and virtual basis.

Each mentor has a duty to care for his or her mentees. Mentors are not involved in the grading of the students but their role is to provide guidance, support and practical feedback on the projects to the students throughout the programme and to share their own experiences with the participants. The goal of these mentoring sessions is for the delegates to receive personal, non-academic support and encouragement. Moreover, mentors shall help the mentees to keep track and provide guidance during difficult periods and obstacles. The effectiveness and thus benefit of the mentorship can consequently vary according to the behaviour of the delegates. According to the opinion of an alumnus, the mentoring support used in the PGDE is perceived in a very positive and helpful manner.

As opposed to the facilitators (see section 1.3.5), mentors at PGDE receive a financial compensation and the majority of the mentors have a practical background, usually being real entrepreneurs, and are encouraged to share their real life experience with their mentees. New mentors are identified based on personal recommendation by other mentors.

Instead of a training workshop, the mentors receive a pre-course meeting where details of the structure and organisation of the PGDE are exchanged and where the mentors get a chance to meet and network.

2.2.6. Management of entrepreneurship education

Internal and external network management

Cambridge is known for its profound networking culture (see section 1.5.1). CfEL manages its network informally on the basis of trust and social capital in the Cambridge cluster by building and maintaining good relationships with partners from the network. Such a close relationship with all network partners is kept through regular contact. Each programme has its own list of contacts and network partners. In the beginning of a new programme, as said by one interviewee, it can be challenging to identify qualified and interested mentors, entrepreneurs or investors, but over time – as the reputation of a programme builds up – it becomes easier. New partners are mostly acquired by CfEL through direct contact in form of recommendation by current partners of the network (see section 1.3).

Evaluation of courses and programmes

The quality and alignment of the PGDE is strictly monitored and assured by a range of committees within JBS. Feedback and evaluation is highly important at CfEL. At the end of each curricular or extra-curricular programme staff, external partners and participants get together

to reflect upon the programme. Hereby, the content, design and structure get evaluated and recommendations as to how to further improve the quality of entrepreneurship education in the upcoming terms are brought forward. To evaluate the participants' opinion on the programmes in a more formal manner, all students get to fill out a standardised, online feedback form at the end of a course. According to an interviewed alumnus, skills acquired by participants of the PGDE include reflection skills, networking skills, emotional intelligence and social skills.

2.3. Extra-curricular activities related to entrepreneurship education

2.3.1. Overview about extra-curricular entrepreneurship activities

UC offers a range of extracurricular programmes and activities related to entrepreneurship education with diverse objectives, target groups and programme designs. There is a diversity of extra-curricular offers that span across the Entrepreneurial Journey (as displayed in Exhibit 1-3). Next to the programmes run by CfEL additional programmes of the UC ecosystem will be described in the following. It should be pointed out that the extra-curricular activities of student-lead organizations, such as the Business Plan Competition, are not part of UC entrepreneurship education itself but are offered independently by students with permission from UC to operate (see section 1.5).

Exhibit 2-3: Overview of extra-curricular entrepreneurship education offers at UC

No.	Name	Objectives	Target group	Offered since	Participants in 2014
CfEL offers ¹					
1	Enterprise Tuesday	Introduce participants to the world of business, as well as to encourage and inspire individuals to pursue their entrepreneurial ambitions.	Students from UC or other universities, local business community representatives, alumni.	1999	Approx. 1500
2	Enterprisers	Action orientated, practical and based on experiential learning, enabling participants to understand their own creativity, generate ideas from research that can be turned into ventures and to build networks.	Undergraduates, PhDs, Post-docs, UC staff and corporate audience, interdisciplinary, international.	2002	Approx. 60
3	EnterpriseWISE	Unlock the entrepreneurial potential of women by developing skills, knowledge and confidence which can be applied to business venture creation, research projects and commercialisation of innovations.	PhD, Post-doc and early career women in science and technology.	2003	NA
4	Ignite	Trial and prepare business ideas for the commercial environment, by practical teaching and mentoring.	Post-doc students, early-stage entrepreneurs and corporate innovators.	1999	Max. 65
Other offers					
5	Accelerate Cambridge (based within CJBS)	Enable and nurture venture creation out of UC through entrepreneurship training, coaching, mentoring and access to shared workspace.	Teams with at least one founder with a "Cambridge connection" (student, alumni, faculty, staff of the University or resident of the town).	2012	NA
6	Business Creation	Support and accelerate entrepreneurship and innovation by	Undergraduate students to PhD researchers,	1999	NA

¹ Arranged in accordance to the Entrepreneurial Journey.

Competition (offered by CUE)	awarding business ideas as well as offering training, mentoring and networking events.	interdisciplinary.		
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Box 2: Enterprise Tuesday

Enterprise Tuesday

Enterprise Tuesday (ET) is a series of evening lectures free of charge which has been offered since 1999. ET is targeted at people who are curious about entrepreneurship and who wonder whether entrepreneurship might be of interest to them. It is thus the first step of the entrepreneurial journey in order to inspire entrepreneurship. Per ET series there are in total about 1500 registrations. Having started at a small scale with approximately 30 students and being solely available to university students the programme nowadays attracts around 300 participants per evening (see: <http://www.jbs.cam.ac.uk/entrepreneurship/enterprise-tuesday/>).

Target group

The lectures are open to everyone with a focus on students from UC or other universities, local business community representatives and alumni. All registered persons are allowed to participate in the event and there is no further selection process involved. There is a diversity of audiences with around half of the participants coming from UC, another third or fourth from the local community and the remainder from outside Cambridge.

Programme design

There is an underpinning curriculum for the lectures that explore different facets of entrepreneurship. The topics range from personal motivation, circumstances, opportunity recognition and validation to more practical business and management issues such as strategy, marketing and funding. Although the programme is an extracurricular open course, there are two additional sessions embedded in the curricular courses of Management of Technology and Innovation students.

In advance of the lectures, each speaker receives a briefing to ensure the fit to the curriculum and to plan the content of the speech. This is to warrant that the integrity of the programme is protected. The lectures are often delivered as panel discussions, providing diversity of views and experiences.

After the lecture, an hour of networking is scheduled to "mingle informally". Additionally, a number of discussion groups on specific topics are provided by organisations such as Cambridge Consultants, Beyond Profit, CUE, the Chartered Institute of Marketing and the Cambridge University Technology and Enterprise Club.

For the purpose of network building, participants of ET need to register in an online registration list. This helps generating participation statistics and to keep people informed about upcoming lectures via newsletters. Feedback of the presentations is gathered by small surveys.

The main funding of ET is provided by HEIF. Furthermore, the programme receives sponsorship from organizations such as Cobra Beer and ARM. In the past, IdeaSpace and Business Link East were involved as sponsors while nowadays the number of sponsors has increased. Generally, speakers offer their lectures on a pro-bono basis. However, their travel expenses usually get reimbursed.

Setting

Currently, 8 ET sessions are offered per year (2 times 4). The number has been downsized from previously 12 provided ET sessions while the depth of the sessions has been increased by duration of 90 instead of 60 minutes each. In order to encourage consistency of attendance throughout the series, CfEL highlights the strength of the curriculum and UC students receive a certificate of attendance for having attended 6 out of 8 ET sessions.

Persons involved

The speakers are leading entrepreneurs, investors and professionals, carefully selected according to the following criteria. They shall be a good match, possess outstanding

entrepreneurial skills and ideally come along with a strong reputation. Participation from internal speakers is also encouraged in combination with entrepreneurs from outside the university. At times, speakers can come back repetitively but with different topics. Speakers are mostly contacted by CfEL although at times CfEL is approached by desired speakers as well.

Box 3: Enterprisers

Enterprisers

With reference to content development, Enterprisers aims at applying creativity to idea generation and innovation with a focus on the health sector². In doing so, the programme grew out of as a project on health design thinking with an emphasis on problems in a hospital setting carried out in collaboration with Massachusetts Institute of Technology in the year 2000. Originally it was called CMI-Connections (i.e. Cambridge MIT Connections) and evolved to Enterprisers in 2002, better reflecting its intention. Business models are focused on social venture creation and social innovation. The Enterprisers programme has been replicated by CfEL in Russia, Australia and Scotland (see: <http://www.jbs.cam.ac.uk/entrepreneurship/enterprisers/>).

Target group

The broad target audiences of Enterprisers are undergraduate students, PhDs and Postdocs, university faculty and corporate audiences with a multi-disciplinary, cross-departmental and international composition of participants. The programme used to be executed in collaboration with MIT only for undergraduates to develop future leaders.

Programme design

The programme focuses on transferable skills development, such as team building or project management. Over time, the programme has been redesigned in a response to a customer comes first approach.

Enterprisers is conducted with 8 groups of 8 participants and two facilitators each. Thus, in total there are around 64 delegates and 16 with varying numbers between 32 and 72 participants over the years.

Entrepreneurship education activities include classroom and group exercises where content is introduced and put into practice afterwards. Case studies are written up as success stories. Students receive feedback on their pitches. All in all, teaching is hands-on but supported by a theoretical framework. According to one interviewee, the framework and curriculum is underlined by research and the practitioners add their individual flavour to it.

Setting

The programme takes place every May in Cambridge. Each of the four days focuses on a certain topic. The first day's topic 'MOI' (which is the French word for 'me') deals with the entrepreneurs' personality, self awareness and ice breaking. The second day concentrates on the idea (ideation). The third day provides skills of networking, motivation and an entrepreneur toolkit (nuts & bolts) and the last day terminates with a pitch (crystal bowl). Participants receive a certificate of attendance and are asked to fill out pre, post and six-months-post follow-up evaluation questionnaires.

Persons involved

Facilitators facilitate the process of learning and individual development. Therefore they receive one day training upfront in order to understand the content and design of the curriculum.

Box 4: EnterpriseWISE

EnterpriseWISE

² Interviewees have stated that Enterprisers might not be continued in its current form in the future.

EnterpriseWISE is a tailored entrepreneurship programme with a focus on female entrepreneurs in science and technology research. Inspired by the idea of the Enterprisers programme, EnterpriseWISE aims at enhancing self efficacy and has also been created by the CfEL in partnership with MIT's Sloan School. Since its establishment in 2003, the programme helps considering starting up new businesses and unlocking the participants' entrepreneurial potential for long-term career enhancement. The procured entrepreneurial skills can be applied to business venture creation, research projects and the commercialisation of innovations (see: <http://www.cfel.jbs.cam.ac.uk/programmes/enterprisewise/>).

Target group

The target groups of EnterpriseWISE are PhD and early career women in science, engineering and technology. This target group showed to be consistently under-represented in mainstream entrepreneurship education programmes. In particular, the programme targets graduates (including Masters, PhDs and Postdocs), academics and researchers as well as early stage career managers. The participation fees are scaled according to the participants' status. UC students are free of charge whereas the fee for Postgraduates is £499 and the Business fee is £995.

Programme design

Research recently conducted by the CfEL and the Faculty of Education indicated that programmes designed and delivered specifically for this female target group could be highly effective. The main objectives are personal development and increasing confidence in being entrepreneurial, highlighting the reality for female entrepreneurs in science and technology and building networks for them.

The educational approach of EnterpriseWISE focuses on self-efficacy skills by adopting methods like learning-by-doing, learning from others and provision of role models. The programme's activities and teaching methods include sitting and listening, talks and lectures, self-reflection, group work and skills trainings, such as presentation and time management skills.

Setting

The programme takes place on two weekends with a gap of over one month in between. This timing was chosen to accommodate busy women in work. At the end of the two weekends, participants are to hold a presentation to demonstrate their self-efficacy skills. The next programme will take place in March and May 2015.

Persons involved

The course designed and delivered entirely by women. The instructors included CEOs, entrepreneurs and managers. Hereby, a focus was set on practical as opposed to academic instructors.

Box 5: Ignite

Ignite

Ignite was established in 1999 with a focus on science and technology, which is a highly important sector in the Cambridge region. The programme can be considered as the first entrepreneurship education programme at UC. Over the years participants have increased from around a dozen to 60 to 80 students. Lately, the programme size has been limited to a maximum of 65 participants (see: <http://www.jbs.cam.ac.uk/entrepreneurship/ignite/>). Ignite has been replicated in Australia with the name "Ignition" in collaboration with Curtin University since 2011 (see: <http://business.curtin.edu.au/courses/centre-for-entrepreneurship/programs/ignition/>) and recently in Austria called "Alpbach Summer School in Entrepreneurship" with The International Entrepreneurship Centre Tirol - Hermann Hauser ((see: http://www.alpbach.org/en/efa15_en/programme-2/summer-school-courses/entrepreneurship/alpbach-summer-school-on-entrepreneurship/). Discussion to develop the similar model in China and Eastern Europe is underway.

Target group

Ignite is targeted at Postdoc students aiming at commercialising their research, early-stage entrepreneurs (with one to three years of business operation) and intrapreneurs. The age range of the participants usually varies from early 20s to late 40s. In 2013 and 2014, the majority of

participants were entrepreneurs, followed by Post-docs and PhDs who are seeking to commercialise their research. The majority of participants have PhDs or Master's Degrees. In 2013 and 2014, the majority of participants were entrepreneurs, followed by Post-docs and PhDs who are seeking to commercialise their research. The age range of the participants usually varies between 23 and 25. Due to the focus of science and technology, the gender ratio is male-dominated. The programme is targeted at people from all different disciplinary backgrounds. Applicants are assessed through interviews on the basis of the novelty, innovation and technical orientation of their projects and their passion for entrepreneurship. Around two thirds of the applicants ultimately get selected to participate in the programme.

About 747 participants from 33 countries across Europe, Asia and America have attended since the programme started in 1999. Based on the recent survey, above 250 business ventures have been created by the Ignite alumni. More than £200 million in funding has been raised and approximately 4,300 jobs were created by Ignite alumni ventures from 2011 to 2015.

Programme design

The learning objective of Ignite is to clarify the ventures of the participants and to develop their networks (e.g. with regard to investors or partners). Teaching is provided by instructors and mentors and also includes skills training. Thereby, groups of 6 to 8 students are built on the basis of the respective project stages and product categories. Each group in turn gets a mentor with a similar background with whom the students at times stay in touch after the finalisation of the programme. Topics discussed throughout the week include markets, business models, financing and team formation. At the end of the week, a celebration dinner takes place for all participants.

Ignite is run in two separate streams –“life science and hi-tech” in order to address the specific needs of business projects/ ventures from different sectors. As teaching methods, keynote speakers, workshops, pitches, presentations, poster sessions, preparatory readings and group or one-on-one clinics or interactive discussions on business ideas or ventures with mentors are employed. All teaching methods focus on personal reflection for constant learning and development of action plans for new business ideas on the route to commercial success. Participants also gain access to a wealth of resources available via Cambridge's entrepreneurial ecosystem, enabling the building of skills and networks that will fuel their enterprise. The ethos behind Ignite is to stimulate high-growth, high-potential ideas into successful business ventures.

Ignite is an extra-curricular, non-accredited programme with a certificate of attendance being handed out to the participants at the end of the week. Students nonetheless get feedback on their projects and performance, for example after the pitch from investors, through a written evaluation form.

Setting

Concerning the structure, the duration of Ignite is one week from a Sunday afternoon to a Friday night with a two to three week pre-course preparation upfront. The students receive a course manual beforehand to prepare themselves for the programme and to create a link to theory through suggested readings. The programme starts on Sunday with a socialising event and a clarification of the goals of the week and the current project stages. The programme is driven by leading entrepreneurs and innovators.

In order to evaluate the course, the coordinators talk to all involved delegates and mentors on a regular basis and a debriefing session at the end of the course is held with all mentors.

Persons involved

Instructors of the Ignite programme include real entrepreneurs, mentors and university delegates. A total of around 100 people contribute to each Ignite programme, such as mentors, speakers, lawyers, accountants or investors. Hence, Cambridge possesses a strong network for teaching entrepreneurship education with more than 1,500 ventures being formed around Cambridge where Ignite can serve as an early accelerator.

Box 6: Accelerate Cambridge

Accelerate Cambridge

This extra-curricular programme is based within CJBS and carried out by CJBS since 2012. It should be noted that the programme is not part of CfEL but is allied to CJBS and has direct reporting lines to it. Its “mission is to enable and nurture venture creation out of the University of Cambridge. Accelerate Cambridge offers a structured approach of three-month programmes that combine entrepreneurship training, regular coaching and mentoring, as well as access to shared workspace” (see: <http://www.jbs.cam.ac.uk/faculty-research/centres/accelerate-cambridge/>).

Target Group

The target group of this programme are teams of two or more members, of which at least one has to have a ‘Cambridge connection’, e.g. student, alumni, faculty, staff of the UC or resident of the town.

Programme design

The Accelerate Programme consists of four levels with different focus areas (see table 1 below). It is designed for entrepreneurs aiming at creating or improving their own start-up companies. Hence, the support that each participant needs is identified at the beginning and the programme is therefore tailored to the specific needs of the participants. It offers students numerous tutoring and mentoring sessions. Assignments include, for instance, pitches in front of investors. According to one interviewed participant, Accelerate Cambridge is very hands-on and a highly valuable programme due to the personalised attention one receives.

Setting

As highlighted in the table below, the setting of the Accelerate programme varies according to the different levels. There are three to eighteen month programmes that entail weekly, bi-weekly or monthly coaching.

Persons involved

The programme works with mentors and coaches whose expertise and investment helps to create ventures outside of Cambridge. They play an essential role to the development of ventures at an early stage as they provide both specialised and general advice. Furthermore, they support established businesses and help them grow.

Exhibit 2-4: Accelerate Programme Stages

Pre-Accelerate <i>Idea and customer development</i>	Accelerate <i>Product development and distribution</i>	Accelerate Plus <i>Go-to-market, bootstrapping and fundraising</i>	Accelerate Star <i>Growth</i>
Three-month structured programme			Up to 18 months
Entrepreneurship education	Entrepreneurship training		Training
Weekly coaching	Bi-weekly coaching		Monthly coaching
Regular mentoring			
Access to shared workspace			
			Access to funding

Box 7: Business Creation Competition

Business Creation Competition

Cambridge University Entrepreneurs (CUE) is an independent student-run association aiming at promoting and nurturing entrepreneurship in Cambridge and beyond. CUE offers students opportunities, such as the Business Creation Competition (BCC) 'Ideas Take Flight', supported by training, mentoring and networking events. Since its establishment in 1999 the BCC has awarded over £500.000 in prize money to more than 40 start-ups and evolved towards an increased focus on technology trends (see: <http://www.cue.org.uk/>).

Target group

The target group of the BCC is the student population from undergraduate to PhD researchers in an interdisciplinary manner. There are competitions held in three areas: Science and Technology, Social Enterprise and Software.

Programme design

The BCC consists of different phases per competition area. Participants can choose one or more of those and enter at any stage. However, entering at an early stage provides access to training, mentoring opportunities and networking events. There are a £100, a £1,000 and a £5,000 competition with different requirements. The £100 competition rewards the best twenty idea proposals, described in 100 words. For the £1,000 competition, the participant has to submit a 1,500 word executive summary of his idea. The £5000 competition requires either a 3,500 word business plan (for the Science and Technology or Social Enterprise area) or a presentation and a 2,000 word business plan (for the Software area).

One interviewed participant describes the competition as a good experience which trains one on how to come up with a valuable business idea. This interviewee especially valued the team work and the team efforts which can "deliver great results". Motivation, in this context, was stated as a key factor for success.

Setting

A series of events is run during the academic year with several events taking place each month, ranging from informal networking events to the BCC, which culminates in a grand finale in May. The events take place in different locations on campus, mostly in the Department of Engineering.

Persons involved

For the BCC the CUE Committee employs in total 10 experts as judges. There are judges for each category (Software, Science and Technology, Social Entrepreneurship) who have a proven track record in the respective field.

2.3.2. Target groups of extra-curricular activities

For a description of the target groups of extra-curricular entrepreneurship education activities, see the boxes in section 1.3.1 above. CfEL generally encourages a diversity of participants in its programmes in terms of nationality, gender and age. All programmes are interdisciplinary regarding the field of study and background to encourage group diversity for mutual learning. In sum, the extra-curricular programmes address a wide range of individuals since there are a variety of programmes focusing on particular needs of specific target groups. On the one hand, several courses correspond to different stages of the entrepreneurial journey, for instance undergraduate and postgraduate students or novice entrepreneurs. On the other hand, there are tailored offers for certain target groups such as female PhDs and early career women in science, engineering and technology or students in Natural Sciences, Technology and Biological Sciences.

2.3.3. Designing extra-curricular activities

For an overview of the design of extra-curricular entrepreneurship education activities concerning intention, contents, methods and media as well as informal assessment, see the

boxes in section 1.3.1 above. Many extra-curricular activities employ experimental and practical learning, such as Enterprisers or BCC, where practitioners hold sessions on how to open a business. Concerning student feedback, one interviewed student stated that the extra-curricular entrepreneurship education activities in Cambridge are fantastic with an enormous range of possible options to choose from, such as teaching programmes, courses, competitions or think-tank programmes.

In accordance with the entrepreneurial journey, the courses apply adequate teaching and learning methods on different stages. The first stage is about building an entrepreneurial mindset which ET covers by inspiring lectures and networking opportunities. The following stages aim at developing entrepreneurial skills and idea evaluation. The pitches in the context of the Enterprisers and ETECH programme respond to this requirement. Eventually, the implementation of a business idea or growth of a new venture can be accelerated by programmes like Ignite or Accelerate Cambridge which employ mentors and offer practical support. All in all, the extra-curricular entrepreneurship education programmes at UC comprise a great number of intentions, programme content and teaching methods.

2.3.4. Setting of extra-curricular activities

For a description of the setting of extra-curricular entrepreneurship education activities in terms of the location, timing and formal evaluation please refer to the boxes in section 1.3.1. These extra-curricular programmes have differing settings concerning their timing, location and formal evaluation of learning outcomes. There are short term courses as well as long term programmes that take place throughout the academic year or up to 18 months as the Accelerate Star programme. The locations are mostly on-campus. Concerning the evaluation of the programmes, approaches vary as well. Some activities are evaluated rather informally through talking and debriefing sessions, whereas for instance, the Enterprisers programme asks the participants to fill out pre, post and six-months-post follow-up evaluation questionnaires.

2.3.5. Persons involved in extra-curricular activities

For an overview of the persons involved in extra-curricular entrepreneurship education activities, see the boxes in section 1.3.1 above. The CfEL employees design and develop curricula and recruit the relevant contributors to deliver the sessions. The programme directors usually hold the structure of teaching sessions and facilitate the learning outcomes for the participants. The programmes offered at UC employ a large pool of practitioners. The entrepreneurial ecosystem in Cambridge provides a valuable base for the integration of mentors. Programmes like Enterprisers emphasize the importance of including facilitators into entrepreneurship education, which is further elaborated upon in the following section.

2.3.6. Management of extra-curricular activities

Management of persons involved in extra-curricular activities

As an elaboration of the activities above, it should be noted that besides mentoring (see section 1.2.5), facilitations are frequently used in CfEL's entrepreneurship teaching activities like Enterprisers or HKP. At CfEL, training of all persons involved in extra-curricular activities, such as facilitators and mentors, is highly important. The training and preparation of mentors is described in section 1.2.5. Back in the days, facilitators received a handbook of the programme in advance as preparation. Nowadays, facilitators receive additional one-day training before the beginning of the programme which shall prepare them for their facilitation role. This training focuses on developing and deepening facilitation skills, such as listening skills, and on briefing the facilitators on the activities of the programmes, such as Enterprisers, and their concrete role in the programme. The overall objective of this facilitator training is to make the facilitation as effective as possible in order to deliver the best (educational) value to the delegates.

Working with industry mentors is an essential element of the programme like Ignite, where about 10 to 12 senior mentors and 10 to 12 MBAs work in teams of two to support the participants on the programme with practical help, senior level mentoring and guidance. CfEL has to ensure that the mentoring activities are "more pull than push" in their style and has a

well honed method for selecting and handling the mentors with deep commercial experience to ensure that delivery is spot on.

Managing student support

One particularity about the facilitation process at the Enterprisers programme is the usage of co-facilitation where each facilitator works as a pair with another facilitator. Facilitation in Enterprisers is provided in a formal (e.g. scheduled facilitation meetings) and in an informal manner (e.g. networking dinners). During the course of the programme, 3 to 4 formal facilitations are scheduled in teams of 5 to 6 students. For an effective facilitation to take place, facilitators need to create an environment of trust and safety. According to one interviewee, facilitation should be process-oriented to eliminate destructive activities and should aim at “getting the delegates thinking”. Thus, facilitation does not imply advising or mentoring students. Concerning the parameters of the facilitation, facilitators volunteer their time but do get their travel expenses reimbursed. The majority of the facilitators has an academic background but it also includes entrepreneurs, corporate employees and incubator representatives. The network of facilitators at CfEL expands primarily through personal recommendation.

Internal and external network management

One interviewee stressed that the most important thing anybody can have is their networks: The larger the network, the higher the chances of success. This certainly seems to hold true in Cambridge. Many networking events with entrepreneurs take place at UC as part of extra-curricular activities, such as ET. It was stated by several interview participants that Cambridge has a unique networking culture with people being exceptionally open to new contacts (see section 1.5). According to one interviewed entrepreneur, “one therefore needs to leverage and position oneself in these networks to get access to people who might help you in pushing your business forward to ease the entrepreneurial process (e.g. by getting access to investors, media or business partners). The strength of UC is that it takes you to the right people. There is an ecosystem where people want to connect and where many ecosystems are established. UC encourages this creation.” In the context of network management, an Information Management System was set up almost a decade ago to coordinate events and activities and to facilitate information sharing.

Management of possible integration of extra-curricular elements

The entrepreneurship education journey in section 1.3.1 presents a good overview of how the individual extra-curricular activities in entrepreneurship education build up on one another. In terms of the management of possible integration of extra-curricular elements along this journey, no additional information could be collected.

2.4. Institutional aspects of entrepreneurship education

2.4.1. Organisational set-up and change

Measures for coordinating and integrating EE across the university

Entrepreneurship education activities are not formally integrated across the university but nonetheless seem complementary to one another as result of close cooperation at UC. Accordingly, educational offers build up on one another and address different steps of the entrepreneurial journey (see section 1.3). There is no explicit model for coordinating and integrating entrepreneurship education at all levels across UC. The majority of the programmes and initiatives were initiated by university staff - often through governmental funding - in response to students’ needs (see section 1.1.2).

On the whole, CfEL and CJBS operate as rather separate institutions. Nonetheless, CfEL is part of CJBS and falls under its administrative, financial and human resources systems and policies. CfEL has its own organisation of its programmes, its own human resource management and its own sources for financing. This budget and the human resources are however provided to CfEL through CJBS. From 2001 onwards, CfEL was set up as a Cost Centre within the CJBS. In the past, CfEL has been very independent of CJBS in autonomously designing and delivering its educational offers while regularly reporting to the faculty board – with the exception of its accredited programmes. Most of CfEL’s programmes are extra-curricular and thus non-certified.

The certification of programmes implies that university-wide quality assurance has to be set up (see section 1.1.2 and 1.2.6). Since 2012, entrepreneurship has become a higher priority of the university's management and as a consequence an increased influence of CJBS and a higher integration of CfEL into CJBS can be observed. According to one interviewee, this causes a move from bottom-up to top-down approaches to entrepreneurship education.

2.4.2. Laws, statutes and codes

Incentives for staff to engage in or support entrepreneurship education

There are no specific incentives for staff to engage in or support entrepreneurship education at UC. There are solely laws and rules indirectly related to entrepreneurship at university level, such as Intellectual Property laws and Human Resource rules. A further aspect of importance is that at times there are limitations for university professors to start their own companies which can impact the engagement in entrepreneurship education. While this law ensures that university professors focus on research and education as opposed to commercial activities, it may also cause that part of the innovations that may stem from research by university professors may not be put into practice by professors through the engagement in entrepreneurial activities.

2.4.3. Mindsets and attitudes

Raising awareness for the importance of entrepreneurship

Through CfEL and other Cambridge-based organizations numerous entrepreneurial events, such as ET or Start-Up Weekends (see section 1.3 and 1.5), are organized in Cambridge which raise awareness for the importance of entrepreneurship. This process has further been facilitated by the provided networking opportunities and the passion and enthusiasm for entrepreneurship within these networks (see section 1.5.1).

Encouraging entrepreneurial behaviour

Entrepreneurship behaviour is encouraged at CfEL through practitioner-based teaching where students develop their own entrepreneurial projects (see e.g. PGDE in section 1.2 or Ignite and BCC in section 1.3) or work in groups with inventors on real entrepreneurial projects (see ETECH in section 1.3). These programmes have helped in changing mindsets by getting people acquainted with entrepreneurship and thereby raising awareness for the importance of entrepreneurship. This process has been facilitated by the development of entrepreneurial skills through entrepreneurship education, such as leadership and social skills. The entrepreneurial mindset implies an open mind for change, failure and networking. Entrepreneurship education can develop that mindset by working with the individual and understanding their motivation and values. This can unlock the 'can-do attitude' and the creative process to embrace an opportunity. The entrepreneurial journey further illustrated how entrepreneurial behaviour is encouraged through entrepreneurship education in Cambridge (see section 1.3.1).

2.5. Outreach to external stakeholders

2.5.1. Types of relationships with external stakeholders

"People are happy to give back in Cambridge" (Simon Daly, PGDE alumni).

CfEL and UC in general have the privilege of being located in a very strong network. Several interviewees mentioned that in Cambridge people like to connect with one another, help each other out and "give back something to the university" which especially holds for alumni. CfEL taps into that culture by acquiring mentors, speakers or partners. As a result, CfEL enjoys a strong local, national and international network which is facilitated by the reputation of Cambridge's educational system. Networks and support systems go hand in hand and include clusters, mentors for support, companies for speakers and sponsorship and advisors. There are 66 networks in Cambridge and these ecosystems are not managed formally but emerge as a bottom-up initiative formed by the people (see section 1.2.6). Numerous stakeholders are

involved in entrepreneurship education in Cambridge. For an overview of these stakeholders, please see the table below and the following section 1.5.2.

Exhibit 2-5: Overview of external stakeholders involved in Entrepreneurship Education at the University of Cambridge

No.	Stakeholder	Type of involvement in EE
1	Enterprises	Guest speakers, mentors, coaches, sponsors
2	Financial institutions	Panel members, investors
3	Support Services (e.g. idea Space)	Networks and support during the start-up process
4	Student organisations (e.g. CUE, CUTEC)	Organisation of events and activities
5	Incubators (e.g. Social Incubator East)	Organisation of events, provision of support services

2.5.2. External stakeholders involved in entrepreneurship education

Enterprises

CfEL collaborates closely with entrepreneurs and managers of companies in its entrepreneurship education. Practitioners can be directly involved in entrepreneurship education as guest speakers (e.g. ET) or as mentors, coaches or facilitators (e.g. PGDE, Accelerate or ETECH). Enterprises can also indirectly contribute to entrepreneurship education by sponsoring events or activities. Hereby, a distinction can be made between visiting entrepreneurs and entrepreneurs in residence in terms of their involvement in entrepreneurship education.

Financial institutions

Although no financial institution has been specifically mentioned by name, it was highlighted that investors were involved in entrepreneurship education as evaluator of idea pitches and consequently as possible investors in potential start-ups (e.g. ETECH, Accelerate or Enterprisers).

Support services

Support to nascent entrepreneurs in Cambridge can be provided by ideaSpace which describes itself as “a community of people in Cambridge starting high impact new ventures” (see: <http://www.ideaspace.cam.ac.uk>). The Cambridge Cluster currently holds approximately 1,500 high-tech companies which provide employment to more than 54,000 people. Out of these companies 12 are valued above \$1 billion and two above \$10 billion. ideaSpace taps into this cluster and provides its members with the Cambridge network to “share experiences with like-minded start-up founders and gain access to some of the UK’s most successful entrepreneurs and investors”.

Student organisations

There are at least four student organisations in Cambridge with a strong linkage to entrepreneurship, namely Cambridge University Innovation Forum (CUIF), Cambridge University Technology and Enterprise Club (CUTEC), Beyond Profit with a focus on Social Entrepreneurship and Cambridge University Enterprise (CUE) as organiser of the BCC (see section 1.3). These student-lead organisations act independently and are not directly part of UC other than given permission to operate.

As one example, CUIF offers numerous networking opportunities, events and start-up support for students. Its uniqueness stems from being an international branch student organization with a virtual network of young researchers. Examples of hosted activities encompass workshops with Cambridge Enterprise, (start-up) companies and political representatives as well as think tanks which aim at solving social problems in an interdisciplinary manner. In these think tanks series, engineering, science and technology students work together in teams of 6 for 3 months on solving a societal problem identified by governments, NGOs or institutions. Students are

selected for participation on a competitive basis according to their fit, expertise, motivation and added value. During this period, students receive group mentoring by professors in related fields. The result of this programme is the publication of a white paper.

CUIF is also in charge of organizing the Innovation Leaders Conference once a year, which focuses on innovations with an entrepreneurial focus in the field on grass-root science and entrepreneurship. It is an open, two-day conference with self-registration. The speakers are usually opinion-makers such as CEOs from major companies or government representatives from the United Nations. The conference goal is, according to one interviewee, "to have young investigators rub shoulders with opinion leaders from academia, government and investors". Feedback from the conference is collected via evaluation sheets and via word-of-mouth feedback whereby the event was regularly described as "one of the best events" one has ever participated in (see: <http://www.inno-forum.org/>).

Incubators, accelerators, science parks and technology parks

There are numerous incubators for entrepreneurship in the Cambridge region. For instance the Social Incubator East is an incubator that is funded by the government. Educational activities provided include the Social Venture Weekend where 40-50 people with business ideas receive the basic tools and inspiration for starting a venture. After that weekend up to 15 ideas are selected that go through the incubation period of six to nine months. Within this period, a Social Venture Week takes place with three days of tackling issues such as legal structures, intellectual property rights, cash flows, market research or business model development. Individual and group mentoring sessions are employed during the incubation period. Anyone can participate in terms of age, gender, discipline but their projects or ideas should be in the field of social or ecological entrepreneurship. The idea of this initiative is to combine classroom learning with practical experience to inspire people to take the intentions to start their own business. The goal is that participants start their own business in the end (see: <http://www.socialincubatoreast.org.uk/ventures/cambridge-hub/>).

Further examples include the Babraham Institute for life scientists (see: <http://www.babraham.ac.uk/>), the St. John's Innovation Center for physical scientists (see: <http://stjohns.co.uk/>) or the Centre for Social Innovation for social innovators (see: <http://www.jbs.cam.ac.uk/faculty-research/centres/social-innovation/>).

2.5.3. International relationships

UC engages in various international cooperations in the field of entrepreneurship education through third-party projects, such as BioIno. This is a project by the European Union which is run by CfEL in combination with Tuscia University, Antwerp University of Applied Science, University of East Anglia and Incrops. It was employed as a pilot project in Cambridge in March 2014 and was replicated due to its initial success in Viterbo, Italy, in September 2014. The target audiences of BioIno are PhD and business students from Antwerp. The aim is to start building an ecosystem for entrepreneurship as support system. Hereby, a model is used to start building the mindset and the ecosystem for entrepreneurship. The BioIno programme design uses the framework of Enterprisers as adopted model for phasing cultural differences, e.g. creativity, business models. It is a three-day programme that offers practical elements with lectures and an additional one-day facilitator training upfront.

Another Example of the EU-funded project is training the European professors in teaching entrepreneurship, collaboration with the European Forum in Entrepreneurship Research in the Netherlands, IESE in Spain and Warsaw School of Economics in Poland. Under this project, three programmes were delivered in Barcelona, Warsaw and Cambridge respectively. The programme targeted the European professors and educators seeking to integrate more effective, appropriate and interactive approaches, and practical skills in teaching entrepreneurship. Through this project, about 160 professors from more than 50 institutions across 30 European countries were trained in entrepreneurship teaching.

Another core part of international partnership is in the areas of training scientists in the area of commercializing research. In partnership with Royal academy of Engineering, UC trains 75 scientists and early stage entrepreneurs from emerging countries such as India, Thailand, Vietnam and South Africa under the Newton Fund Programme. The focus of those programmes is building the capacity of researchers for entrepreneurship and commercialisation of their

innovations, and increase networking and connectivity between UK and the developing countries in the area of science and innovation partnerships. Further international partnerships in entrepreneurship education of UC include universities in Shanghai and Hong Kong regarding building entrepreneurial mindsets and gaining exposure to the entrepreneurial ecosystem and practices of Cambridge. These partnerships are on an on-going basis and about 100 undergraduates from China and HK have been trained in the last two years. Laurea University in Finland is another educational partner of UC through its cooperation in teaching and the creation of boot camps.

Another level of partnership is through its regular programmes. For Example, since 2006 Ignite has developed a strategic partnership with the organizations which have actively promoted and supported entrepreneurs and early stage ventures in their local regions such as La Caixa *premio Emprendedor XXI* in Spain, ASTER in Italy, Foundation for Polish Science, Biotechnology Industry Research Assistance Council, A Government of India Enterprise and Cannan Partners, Informatics Ventures and Royal Academy of Engineering in the UK and Shanghai Art & Design Academy, Shenzhen Nanshan Science and Innovation Bureau in China. Those organisations sponsor their entrepreneur winners to attend Ignite in Cambridge regularly.

In addition, as a part of capacity building with regard to entrepreneurship education, UC works with the partners in other countries to replicate its regular programmes. For example, Ignite model brings together experienced entrepreneurs, investors, science and technology sources and the wider ecosystem in accessing new ideas and venture creation. In order to stimulate this type of connections in wider ecosystem in other regions, *Ignition* programme was developed in collaboration with University of Curtin in Australia and *Alpbach Summer School in entrepreneurship* with The International Entrepreneurship Centre Tirol - Hermann Hauser. The target group of Ignition is anyone from Australia and Asia who are passionate in developing an idea into a real business. The target group of the Summer school in Austria are PhD or Post-Doc students and researchers from the fields of technology, advanced engineering, science and mathematics, ideally from equal parts from Tyrol, Austria and Europe. The objective is to encourage and foster individual entrepreneurship in creating new employment opportunities in Europe and have positive influence on the economic development.

2.6. Impact and lessons learned

2.6.1. Evaluating impacts of the entrepreneurship education approach

Overview of impact evaluation methods applied

Although no precise impact evaluation methods were announced during the interviews, the impact of CfEL as a whole on the Cambridge region is substantial (see: <http://www.cfel.jbs.cam.ac.uk/aboutus/achievements.html>). According to Prof. Vyakarnam, during the centre's ten years 250 new businesses have been set up by CfEL alumni employing 2,500 people. One start-up example is MagicSolver.com, which is a developer of innovative iPhone Applications, set up by ET alumnus Emmanuel Carraud (see: <http://www.cfel.jbs.cam.ac.uk/aboutus/alumni/index.html>). Numerous UC and CfEL graduates stay and work in the Cambridge area and in the last two years CfEL alumni have raised £120 million in funding. The number of students at CfEL has scaled up from approximately 200 students a year in the inception period to 1500 to 2000 students a year in recent years. Since 2003 more than 16,000 people have participated in the 200 completed CfEL programmes and events. In this context, over 500 educational videos, video clips and podcasts published since 2008 and an established network of more than 300 entrepreneurs and practitioners have contributed to CfEL entrepreneurship education activities. The quality of research in entrepreneurship and entrepreneurship education at CfEL gets formally assessed via the Research Excellence Framework in the United Kingdom (see: <http://www.ref.ac.uk/>). During CfEL's 10-year-anniversary celebration in December 2014, the overall impact of CfEL was summarized as follows:

"The centre has made a special contribution to the university and to society. A university relies on goodwill and the centre has helped build good will." (Dr Andy Hopper, head of the university's computer lab).

"The centre has made a real impact on enterprise at the school, and it has now started to accompany and support fledgling businesses as they grow into companies and need to put

processes and structures in place.” (Professor Christopher Loch, Director of the Judge Business School).

In terms of the student feedback, it was mentioned by an alumnus of the PGDE that especially the mentoring report, the financial knowledge, the networking opportunities and the residential periods were considered as highly valuable. Overall, it was an excellent and challenging course. The course management was good and people were very accessible. The assignments floated with a purpose and were relevant. The geographical flexibility was appreciated by several students. As possible point of improvement, it was mentioned that the feedback and guidance throughout the course could be further intensified.

“UC education gets you inspired. Entrepreneurship education at UC gives you the confidence to go and try things out. Whether you fail or not does not matter as long as you dared to try and gave it your best shot at exploring your opportunities. [...] I think the Postgraduate Diploma is the best entrepreneurship course in the country, especially with regard to resources, expertise, knowledge and intellect. If you are serious about entrepreneurship education, you can’t afford to not do this course.” (Simon Daly, PGDE alumnus).

2.6.2. Lessons learned

Summary of lessons learned from this case

The key lessons learned from this case can be grouped into six different categories of importance to entrepreneurship education, namely human and financial resources; practice-based entrepreneurship education; a blended teaching approach to entrepreneurship education; constant adjustment, innovation and reflection of entrepreneurship education; developing entrepreneurial skills and mindsets; and the role of networks and supporting ecosystems.

First, when looking at **human and financial resources** for entrepreneurship education, stability matters (see section 1.1. and 1.4). Entrepreneurship education and building the enterprise agenda takes time. CfEL has a long established team and employees possess a strong loyalty towards the Centre. There is a strong belief at CfEL in its mission to “spread the spirit of enterprise”. This high degree of familiarisation and commitment enhances the quality of entrepreneurship education at CfEL and facilitates the development of its staff and its educational offers. Universities play an important role for companies and countries and high turnover can be a severe risk for entrepreneurship education as stated by one interviewee. Besides, money for facilitators’ or mentors’ training and ongoing development is important to ensure that all facilitators and mentors provide the highest possible support. Nonetheless, according to one interviewee, the question remains in this context about which expenses for entrepreneurship education support staff are justifiable with regard to training and payment as reward. Interviewees highlighted that budgets and monetary matters should be embedded in the system and funding should be provided on a long-term basis with a minimum planning horizon of five years. Long-term funding such as the HEInnovation Fund in the United Kingdom was very helpful for a long-term perspective on entrepreneurship education. This is needed since it takes time to see results of entrepreneurship education. Such practices shall serve as incentive for creating and sustaining a programme. Moreover, recognition and acknowledgment are vital, both for the participating students but also for the academic personnel involved in providing entrepreneurship education. As a related aspect, it was further argued that enhanced integration of entrepreneurship education and thus coordination of all personnel involved is needed. Separate units, like CfEL, thus need to collaborate more closely with the respective units and institutions to foster entrepreneurship education to aligned bottom-up and top-down initiatives. One interviewee mentioned “that to disrupt the system for entrepreneurship education from bottom-up you need the bin from the top”.

Second, CfEL is unique because it uses entrepreneurs to teach entrepreneurship. By hearing stories, mistakes and real-life examples, students experience **practice-based entrepreneurship education** by teaching *through* and *for* entrepreneurship (see section 1.2 and 1.3). It is auxiliary to align the structure of a programme, such as the PGDE, to its system and to the predominant culture in that system to create a fit. In Cambridge, innovative entrepreneurial behaviour is widespread and encouraged and therefore a practice-based entrepreneurship education approach is well suited to the Cambridge environment. Practitioner-based education and building ecosystems were regarded as the right things to do and it was

emphasized in this respect that nurturing alumni and keeping in touch with them actively should be practiced. Furthermore, mentoring, coaching and facilitation were considered as crucial in the context of (practice-based) entrepreneurship education. It is important to keep mentors and ecosystems connected. In terms of the student group composition, multi-disciplinarity was practiced to encourage creativity. Overall, several interviewees came to the conclusion that there is a “huge appetite” for entrepreneurship education, especially when it is framed in a practical fashion.

Third, to keep entrepreneurship education up to date, a **blended teaching approach** may be needed which combines online learning with presence learning (see section 1.2 and 1.3). 70-80% of the education at CfEL concerning the PGDE is conducted online through the VLE. During the interviews it was repetitively pointed out that VLEs have an important role to play in the context of entrepreneurship education. Feedback from the interviewees on e-learning was generally positive and several advantages in terms of flexibility and creativity were highlighted. It was nonetheless mentioned that e-learning should not be used on its own but in combination with presence learning to enable personal interaction which may in turn also lead to team spirit and bonding. Potential risks of a virtual learning environment should simultaneously be kept in mind including the length of the adjustment period and the information overflow (e.g. in group chats).

Fourth, since entrepreneurship education is highly complex **constant adjustment, innovation and reflection** were highlighted as fundamental (see section 1.2.6 and 1.3.6). Change can be a good thing. At CfEL courses constantly develop and change. Renewal is thus framed in a positive manner. Feedback, reflection and evaluation enhance the quality of entrepreneurship education. It enables constant adaption and improvement of educational offers by taking feedback into account in the content, design and nature of the courses. Hence, a feedback loop is needed to keep innovative. Innovation is key and universities or research institutes can serve as a vital source of innovations and thus should be kept as long-term, stable resources. Competition between universities pushes innovative entrepreneurship education forward to deliver the best education possible and to serve as a role model for others.

Fifth, developing **entrepreneurial skills and mindsets** which encourages entrepreneurial behaviour is key (see section, 1.2, 1.3 and 1.4). One interviewee emphasized that the right mindset is needed for a constant development of education and that entrepreneurship and entrepreneurial skills are different. There is a difference between a knowledge economy and a skills economy. Universities tend to focus more on the knowledge economy and neglect the skills economy. As lecturer or course coordinator, one needs to embrace and use a variety of methods in entrepreneurship education. It is not solely about knowledge and content but also about combining skills development, personal development and project-based work. In the context of fostering entrepreneurship, the development of leadership skills, social skills and creative problem solving skills are indispensable according to one interviewee. Learning from peers also matters. Moreover, the development of mindsets, visions and right intentions are important (i.e. if you know what you want you can find a way). Ultimately, personal reflection skills were highlighted as fundamental especially when it comes to understanding one’s own personal motivation for entrepreneurial behaviour.

Sixth, **networks and supporting ecosystems** are essential for entrepreneurship education (see section 1.5). Several interviewees pointed out that networks, the sharing of contacts and openness for collaboration and innovation are extremely relevant for entrepreneurs. Entrepreneurship is more likely to happen when there is a strong network and support system behind it. Cambridge knows how to network and thereby creates a personal environment with a “village feeling” according to one interviewee. An ecosystem has developed in the region and people are very keen to give back and foster that ecosystem by investing time and money into it without solely looking at their personal gains. This entrepreneurial ecosystem makes Cambridge unique. The respective support systems are helpful by encouraging creativity and the entrepreneurial spirit in the region. On top of that, people seem to be more open because of this encouraging environment which provides reasons for collaboration and creates chains of interdependence. In the same context, one interviewee emphasized that knowing how to approach investors or companies and knowing how to communicate and carry your self is vital. The same holds for knowing how to pitch and how to leverage while networking your background during discussions. Entrepreneurship education in Cambridge can foster the nurturing of these vital social and networking skills and can provide a much needed support system for aspiring entrepreneurs.

Transferability to other universities

UC is an elite university. It was mentioned by one interviewee that in Cambridge approximately 40% of all university students come from prestigious private high schools like Eaton, Winchester or Harrow which is largely above the country average of 2%. Due to the prestigious reputation of the university in combination with the required studying fees, money may be less of an issue in Cambridge than it is in other university contexts. Moreover, the strong networking ties in Cambridge are also quite unique. These aspects have to be taken into account when thinking about the transferability of the entrepreneurship education approach of UC to other universities. However, in recent years a change towards focussing less on elite education at UC but rather on granting entrance to the university to students from all backgrounds based on merits has been observed. This reputation facilitates the attraction of excellent entrepreneurship educators and the acquisition of financial resources to engage in entrepreneurship education. The acquisition of human and financial resources for entrepreneurship education might be more challenging in other university contexts.

In terms of the transferability, it should further be mentioned that numerous successful programmes that were initially developed in Cambridge have, over time, been copied by other universities on a global scale. Examples encompass ET, Ignite, Enterprisers, the BCC and the Start-Up Weekend which were all pioneers of its kind while the PGDE was the first accredited programme of its kind in the world. There are manifold support systems out there for aspiring entrepreneurs which are comparable to the ones in Cambridge. According to one interviewee, scalability and transferability can especially be fostered by a move to e-learning or blended learning. Through e-learning, knowledge transfer and skills development content becomes easier to share, which facilitates the up-scaling of educational activities through online usage of podcasts, videos and discussion forums. Simultaneously, e-learning enables monitoring statistics of students, which in turn advances the ability to assess the impact of entrepreneurship education.

CfEL places a strong emphasis of sharing its best practices and lessons learned on entrepreneurship education with others. Knowledge exchanges takes place through its open website, frequent public talks and its publications (e.g. see: Vyakarnam, S., & Hartman, N. (2011). *Unlocking the Enterpriser Inside: A Book of Why, What and How*. World Scientific Publishing Co. Pte. Ltd.: Singapore).

List of Abbreviations

BCC	Business Creation Competition
CEC	Cambridge Entrepreneurship Centre
CfEL	Centre for Entrepreneurial Learning
CJBS	Cambridge Judge Business School
CUE	Cambridge University Enterprise
CUIF	Cambridge University Innovation Forum
CUTEC	Cambridge University Technology and Enterprise Club
ET	Enterprise Tuesday
HKP	Hong-Kong Programme
PGDE	Postgraduate Diploma in Entrepreneurship
UC	University of Cambridge
VLE	Virtual Learning Environment

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of Wuppertal, on behalf of the study for supporting the entrepreneurial potential of higher education (sepHE).

Because the University of Cambridge is an already prominent and well knowing case of entrepreneurship and entrepreneurship education in Europe, this case study uses foremost interview data collected on site rather than existing published material. Sources and references used include desk research plus:

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3. University of Coimbra, Portugal: Supporting nascent entrepreneurs by extra-curricular activities

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Abstract



University of Coimbra has been investing in fostering entrepreneurship amongst the region over the past three decades. It has used the academy as the epicentre of the major initiatives that have been developed. The initial phase prioritised the development of infrastructures to support start-ups in the region. However, in the past five years University of Coimbra has concentrated in the capacitation of all these assets, namely establishing several integrated immaterial activities, framed by a structured regional entrepreneurship ecosystem that involves ten core partners and more than 600 regional stakeholders. This ecosystem is led directly by the University of Coimbra Rectory Team and implemented, managed and monitored by the University of Coimbra (DITS – Divisão de Inovação e Transferências do Saber – Knowledge Transfer Unit). The ecosystem and has the vision to contribute largely for positioning the Centre Region of Portugal as one of the 100 most innovative regions in Europe, according to the Regional Innovation Scoreboard. Consequently, the entrepreneurship education initiatives focus on fostering and supporting nascent entrepreneurs and supporting their companies with the help of partners from the regional ecosystem. The University of Coimbra has a strong focus on extracurricular activities coordinated by University of Coimbra DITS in close collaboration with IPN – the university incubator.

Case study fact sheet

▪ Full name of the university, town, country:	University of Coimbra, Portugal
▪ Legal status	Public
▪ Campuses:	3
▪ Year of foundation:	1291
▪ Number of students (year):	approx. 22.000
▪ Number of employees (broken down by teaching, research and administrative staff):	2.491, about 1,586 teaching and research and 905 administration
▪ Budget in most recent financial year:	171ME (2013)
▪ Academic profile:	Third largest University of Portugal, a full university with a very long tradition. Faculties: Arts and Humanities, Law, Medicine, Sciences and Technology, Pharmacy, Economics, Psychology and Education Sciences, Sport Sciences and Physical Education
▪ Entrepreneurship education profile:	Faculty of Sciences and Technology is the origin of Entrepreneurship Education. The university has a strong impetus on extra-curricular activities and an increased focus on curricular activities.
▪ Activities focused in this case study:	Developing EE from the scratch of non economics and business faculties and a strong emphasis on extra-curricular elements coordinated and supported in the DITS (Divisão de Inovação e Transferências do

	<i>Saber), Innovation and Technology transfer office</i>
▪ <i>Case gatekeeper:</i>	<i>Jorge Figueira, DITS – Divisão de Inovação e Transferências do Saber – Knowledge Transfer Unit</i>

The status of information in this case study is end of year 2014 unless stated differently.

3.1. The university's entrepreneurial profile

3.1.1. The university's overall approach to entrepreneurship education

Entrepreneurship Education in the University of Coimbra consists of varied curricular as well as extra-curricular offers. The curricular elements are based on several initiatives from different staff-members in different faculties, mainly non-economics and business subjects. Concerning extra-curricular elements, the main driver of the initiatives inside the university is the university unit DITS (Divisão de Inovação e Transferências do Saber, Innovation and Technology Transfer Office) with about ten staff-members, offering a broad range of courses, competitions etc. targeting nascent entrepreneurs and the development of business ideas. The main drivers of curricular activities can be located in The Faculty of Sciences and Technology, which was the first to offer entrepreneurship and management related courses in the year 1993. It has operated in close cooperation with the IPN (Instituto Pedro Nunes), the Association for Innovation and R&D Sciences and Technology.

IPN is a non-profit organisation founded in 1991, which promotes innovation and the transfer of technology. IPN is regarded as the starting point of fostering entrepreneurship in Coimbra and the region. Since then, the connection between the IPN and the University of Coimbra has been very close. For example, members of the IPN management board also teach engineering classes regularly. The board president from IPN must be a science and technology faculty member of University of Coimbra. As told by an interviewee, the existence of IPN not only changed the spirit toward entrepreneurship at the university but also the whole town. The foundation of GATS (later DITS) in 2003 resulted in close cooperation with IPN. But in spite of being technologically oriented, DITS is not only in close contact with the academic staff of the Faculty of Sciences and Technology but also with the academic staff of the all other faculties. To give but one example, the employees of DITS are involved in teaching courses, such as on the issue of patents.

The University of Coimbra is a traditional, largely diversified university. Students still live traditional rituals and are at the same time, very actively involved in student initiatives, such as the students' union (AAC, Associação Académica de Coimbra), BEST – Board of European Students of Technology, JEKnowledge (Sciences and Technology Faculty Based Junior Enterprise) and JEEFEUC (Junior Empresa de Estudantes de Faculdade de Economia da Universidade de Coimbra, Junior Enterprise of Students of the Faculty of Economics of the University of Coimbra). This results in a special student culture that has a big influence on the strategic decisions at the university as well as a big impact on the societal life on the approximately 100.000 habitants of city of Coimbra.

It seems to be a strength of the UC to have different nucleus of entrepreneurial learning. In the faculty of Sciences and Technology as well as in several other faculties, the initiative of starting with entrepreneurship courses was a result of the experience that graduates of the respective area needed insights in entrepreneurial thinking and behaviour to be prepared for their professional careers. Some of the interviewees said that being a faculty member does not mean that you cannot be an entrepreneur. The awareness of this dual role seems to be an interesting point in the development of entrepreneurial potential in the UC. Due to its strategic orientation the Faculty of Economics only recently started to teach entrepreneurship and appointed an Associate Professor.

The starting point of Entrepreneurship Education can be dated back to the academic year 1993/94. UC started teaching a course called "Management for Engineers" in the Department of Chemical Engineering with a new concept, asking the students to write a business plan and involving them as peer evaluators. As told by interviewees, in those times, some of the more conservative parts of the faculty were reluctant and the concept was not in the mainstream at all. The existence of IPN had an important role disseminating this new attitude. Other departments started similar courses, such as mechanical engineering, materials engineering, physics engineering, biochemistry, biology and some master programmes in different fields of life sciences.

One of the initiators of this type of courses later became pro-rector (a second rectorate level under the vice-rectors) and created DITS (see above). At the time of the creation of DITS, a member from the Faculty of Sciences and Technology became Rector, which didn't happen from

long time ago. This fact reflects the institutional and paradigmatic change at the UC and DITS was closely connected, organically, with the Rectorate. The current Executive Manager of DITS himself took part in the very first entrepreneurship course in 1993 as a student still. In 2004, UC began to establish an entrepreneurial culture, such as holding monthly conferences with well-known entrepreneurs and managers from Portugal.

University of Coimbra has been investing in the last three decades in fostering entrepreneurship amongst the region. In an initial phase, infrastructures were the priority (creation of a business incubator, a knowledge transfer unit that is also responsible for stimulating entrepreneurship, construction of the 1st Portuguese biotechnology park and, more recently, the investment in a business accelerator and a science and technology park). Since 2009, UC has been concentrated in the capacitation of all these assets, namely establishing several integrated immaterial activities, framed by a structured entrepreneurship ecosystem that involves 10 core partners and more than 600 regional stakeholders (municipalities, angels and risk capital, companies, non-profit associations, students union, etc.). This regional ecosystem, called Inov C³ (see chapter 3.1.2) is led directly by the University of Coimbra Rectory Team. It is implemented, managed and monitored by the knowledge transfer unit DITS and has the vision to contribute largely for positioning the Centre Region of Portugal as one of the 100 most innovative regions in Europe by 2017 according to the Regional Innovation Scoreboard (RIS).

In the beginning of the programme Inov C, the Centre Region of Portugal ranked in the 153rd place in the regional innovation scoreboard (RIS). In the edition of RIS in 2012, the region had already made its way to be among the 100 most innovative European regions. The vision related to the Regional Innovation Scoreboard (RIS) for 2017 was already achieved. The interviewees are aware that this was not due to the impact of the programme alone, but it had a major role in the improvement of the regional performance. However, as a result of the economic crisis, in 2013 the region was no longer amongst the 100 most innovative European regions.

In 2010, the IPN was considered the world best science-based incubator by the Centre for Strategy and Evaluation Services (CSES), founded by former members of Ernst & Young's Economics Group. The university and its core partners are involving the regional and local partners and stakeholders in their strategy, using participative budgeting initiatives. This framework that supports entrepreneurship and its governance is interpreted by the interviewees as the most innovative aspect in the UC approach. They state that, "When the ecosystem was created in 2009, few were the universities in the world that were leading and deploying such a holistic entrepreneurship pipeline connecting territory and society". The entrepreneurship education efforts of the University of Coimbra are therefore strongly focused on the involvement of students in "real entrepreneurial activities" and concentrate on extra-curricular activities that address the needs in the different stages of maturity of entrepreneurs and entrepreneurial projects. Nonetheless, UC also makes efforts to integrate entrepreneurship in the formal curriculum. The most prominent example is the Master programme in Social Intervention, Innovation and Entrepreneurship.

3.1.2. Leadership and governance

Importance of government strategies

The University Intellectual Property Regulation was created at the end of 2003. It supported the development of the university IP portfolio and subsequent IP valorisation activities promoted by DITS. The creation of the Portuguese provisional application by the government (similar to the US provisional application) also acted as a catalyst in all the implementation of IP policies and activities at Portuguese universities.

In 2009, there was a call from the regional government to foster incubation and science. After having built several incubators partly lacking the desired output, they looked for possibilities to transform the central region of Portugal into an innovative and entrepreneurial region. Only public universities could apply to be a part of this. University of Coimbra created an

³ See <http://www.inovc.pt/>, last access 23/11/2015.

entrepreneurial ecosystem with ten core partners and 600 regional stakeholders, called Inov C (see above). They applied for the money and were provided with a funding of 54 Mio Euro (co-financed by the EU) from the year 2009 to 2014. Taking in account the good results achieved, it is expected that Inov C will get funding for a consolidation phase, which might last until the year 2020. The policy is still start-up-oriented: Fostering entrepreneurial thinking and mindset should result in more start-ups. Entrepreneurship Education at UC also has this focus.

The general focus of governmental politics to foster entrepreneurship in the region is on “immaterial projects”, such as creation of technology scouts, identification of the R&D and innovation potential, management of intellectual property, creating a system of ignition grants, business ideas contests, supporting and encouraging participation in national innovation contest, and entrepreneurship and innovation courses taught in colleges and universities. It is no longer on “material projects” (infrastructural), such as buildings, or incubators.

Importance of entrepreneurship in the university’s strategy

UC presents a Strategic Definition Framework on his website. The strategic pillars in the area of missions are Research, Education and Knowledge Transfer. The latter is subdivided in three areas, one of them called “Innovation and Entrepreneurship”.⁴ In the respective “Strategic Plan 2011-2015”, in the chapter “knowledge transfer” one of six strategic initiatives presented reads as follows: “to promote a culture of creativity and innovation, entrepreneurship, and a critical stance”⁵.

Today, one of the vice-rectors is responsible for scientific research, innovation, entrepreneurship, special services, libraries, and relations to non-profit companies⁶.

The entrepreneurial ecosystem, Inov C, is coordinated by the University of Coimbra. The leading function of UC in the group of core partners (University of Coimbra, Polytechnic Institute of Leiria, Polytechnic Institute of Coimbra, Pedro Nunes Institute, Pedro Nunes Incubator, D. Dinis Incubator, Biocant Park, ITCons, Coimbra Innovation Park, Óbidos Technological Park) is presented to the public frequently by standardized presentations.⁷

DITS is in line with other mainly administrative units and do not have an independent or special status (see below).

Extent of high level commitment to implementing entrepreneurship

The Rectorate entered in the entrepreneurial process by having a pro-rector in 2003 who was also the creator of DITS. The same pro-rector became vice-rector further on and advanced the topic of implementing entrepreneurship education. The Inov C initiative is considered a great opportunity to disseminate entrepreneurial ideas to smaller villages. The actual vice-rector who manages the entrepreneurial ecosystem states that the decentralized model is efficient and that the co-operation with the poly-technical schools is beneficiary for both institutions and the region. He argues that an open dialogue is necessary to collect ideas and foster the entrepreneurial process. Student’s influence in the university strategy is relatively high.

Level of faculties’ and units’ autonomy to act

The faculties decide about the conception of the study programmes. New study programmes have to be accepted by the Senate and have to be formally approved by the government. Due to the Bologna process, the programmes also have to pass accreditation agencies. DITS is part of the Administration and in this case, part of the organizational unit of the Centre of Specialized Services (Centro de Servicos Especializados) as well as in line with other services of the University (such as the Division of International Relations)⁸. According to several interviewees, this sometimes causes difficulties in the daily work because this forces the unit to act within the

⁴ See <http://www.uc.pt/en/planning/framework>, last access 15/05/2015.

⁵ University of Coimbra: Strategic Plan 2011-2015, without year, page 32, <http://www.uc.pt/en/planning>, last access 15/05/2015.

⁶ See <http://www.uc.pt/governo/reitoria>, last access 4/5/2015.

⁷ Internal information, not publicly downloadable, disseminated whenever asked.

⁸ See for the University’s organization <http://www.uc.pt/en/sobrenos/organograma?hires>, last access 25/11/2014.

somewhat bureaucratic structures of the university administration. It could be an advantage to have more autonomy to act especially when contacting and co-operating with external stakeholders, or the core partners, or the broader network.

Organisational implementation

The curricular elements are organized in a de-centralized manner. Each faculty develops his courses or accredited studies independently but under rectoral team supervision. Entrepreneurship mainly is not organized in Entrepreneurship Chairs. If necessary, staff members contact academic staff of other faculties or DITS or IPN to ask for courses or single lectures in special fields. Only recently, UC established an Assistant Professor dealing with entrepreneurship in the Faculty of Economics.

The extra-curricular activities are mainly centralized and are offered and coordinated by DITS in close cooperation with other stakeholders such as IPN or junior enterprises.

University's importance for driving entrepreneurship in its environment

Each year, more than 3000 students are involved in entrepreneurial activities and initiatives. More than 200 start up and spin-off companies were created since 1997 that in the last year had a turnover of more than 80M€ (>35% export) and are employing approximately 1700 highly qualified workers (direct jobs). Besides the 1700 highly specialised direct jobs created with spin offs and start up creation, UC estimates that around 4800 indirect jobs were also created (Coimbra is a city with approximately 100.000 inhabitants).

The student's commitment to Coimbra society is high. Students are organized in different student's initiatives, such as "JEKnowledge", a Science and Technology Faculty based junior enterprise with students mostly of the Faculty of Science and Technology, and "JEEFEUC" (Júnior Empresa de Estudantes da Faculdade de Economia da Universidade de Coimbra, which translates to junior enterprise of the Faculty of Economics)⁹ with students from the areas of economics, law, design and psychology. These associations aim at the development of student competencies by providing services for real companies. They act independently from the university structure but have a committee of professors acting as an advisory board and often have a close relation to DITS, especially in the case of "JEKnowledge": Members of JEKnowledge proposed the project "INEO Start Up" to DITS and IPN to be implemented as an extra-curricular activity. In 2013, the same organisation started with a project in a high school: They trained high school kids in informatics, with the aim to promote entrepreneurship in Coimbra.

Another student's initiative is BEST – Board of European Students of Technology with five local groups and students from the Faculty of Science and Technology. This organization aims at the development of soft skills in students by training workshop, events and competitions.

The most important student's association is the student union AAC (Associação Académica de Coimbra), legitimised by elections. Representatives of AAC are members of the different boards of the University of Coimbra, such as the Senate. They offer a broad range of activities in sports, culture, and other areas to the public of Coimbra. Their high commitment and involvement reflects a strong entrepreneurial behaviour.

Interviewees pointed out that in Coimbra students work closely with each other; that they want to get involved in everything, and take part in the development of the community. All this gives the impression that student position in the University and in the city is crucial, be they "clients of research and education" and promoters of new ideas at the other hand.

The close collaboration with the IPN, the mutual support in entrepreneurship projects and teaching as well as the involvement in Inov C is a driving force for entrepreneurship development in the wider regional, social and community environment.

⁹ See <https://pt-pt.facebook.com/jeefeuc>, last access 25/11/14.

3.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

The individuals involved in Entrepreneurship Education consist of three groups: First, members of the academic staff: about five members of the academic staff in the Faculty of Sciences and Technology, two in the Faculty of Psychology and Educational Sciences, about five in the Faculty of Economics, and approximately five in all the other five faculties. Second, more than ten practitioners per year (especially in the Faculty of Sciences and Technology) who teach regularly at the University. Third, about three to four staff-members of DITS. In the majority of the cases, the individuals involved are highly engaged in the topic for different reasons and developed the entrepreneurship education offers independently from scratch.

Financial resources for entrepreneurship education

Concerning the involved members of the staff, there are extra financial resources to develop the offers or, as in the case of the “Master of Social Innovation and Entrepreneurship”, it is done by the already hired staff.

In 2009, together with ten core partners, the University of Coimbra applied for funding from the EU structural fund together and received third party funding of about 54 Mio €, thereof 85% is funding from the EU and 15% from co-funding. The money is spent for material projects and immaterial projects (see above). The money is not directly invested in entrepreneurship education. The DITS is in charge of the extra-curricular offers which some are not for free, but are supported financially through their fees.

3.2. Entrepreneurship in curricula and teaching

3.2.1. Overview of curricular offers

It was not possible to get an exhaustive list of curricular offers because all of them have different approaches and names. Interviewees from the Faculty of Sciences and Technology stated that all engineering programmes have a course related to entrepreneurship/management/innovation. Therefore, the list contains some of the programmes and courses investigated by the study team, numbers one to five-5 will be described more in detail in chapter 3.3.3.

No.	Name	Objectives	Target group	No. of participants in 2013
1	Social Intervention, Innovation and Entrepreneurship Master	Students have analytical skills, as well as planning and social intervention capacities, to enable the emergence of creative, reflexive and socially sustainable initiatives addressing issues such as social vulnerability, social exclusion, precarisation and socio-economic and cultural inequalities	(International) Students with a Bachelor’s degree in Economy, Social Work, Sociology, Anthropology, Social Sciences, Social Psychology, Management and Engineering. Practitioners from the field of social intervention, current and prospective social entrepreneurs	30
2	Innovation and management processes	Students get into deep what is innovation. They transfer a new idea in a business model.	Bachelor students of the Faculty of Sciences and Technology, from the area of informatics	90-100

			engineering in their third year	
3	Entrepreneurial New Ideas	Students understand the significance of innovation. They are able to develop innovative ideas.	Bachelor students of the Faculty of Sciences and Technology, from the area of informatics engineering in their third year, 90-100 students per year subdivided in around 17 projects	60-80
4	Technological Innovation and Entrepreneurship	Students think and behave as entrepreneurs in their day-to-day life. They develop a business idea and a value proposition using creativity tools. They negotiate with suppliers, investors and clients.	Master students of the Faculty of Sciences and Technology, area of physics engineering, biomedical engineering; open to students of all other faculties (for credits)	140
5	Entrepreneurship and Business Challenge	Students relate knowledge from different areas and technical skills, such as identifying business opportunities, assess its potential and further develop a business plan, turning knowledge into sustainable businesses with product and services-oriented ideas.	Students at Master level at the 2nd year from the disciplines of medicine, pharmacy, architecture and tourism	60-70
6	Entrepreneurship and Business Project (mandatory)	Students relate knowledge from different areas and technical skills, such as identifying business opportunities, assess its potential and further develop a business plan, turning knowledge into sustainable businesses with product and services-oriented ideas	Management Students in the 3 rd year of Bachelor	100

3.2.2. Target groups

The curricular change brought around by the Bologna process gave several degrees the opportunity to include entrepreneurship in its curricula, especially the engineering school. Another important target group are students with interest in social service and entrepreneurship. Those students apply for the Master of Social intervention, Innovation and Entrepreneurship. Recently, to address other curricula that did not include disciplines of this nature an optional discipline on entrepreneurship (course: Entrepreneurship and Business Challenge, see description below) is offered to any student who wants to attend it, across all three campuses.

3.2.3. Designing lectures and courses - basic curricular decisions

The curricula based courses are not established university wide but are located in different faculties and topics.

It was not possible to extract a canon of expected outcomes from the different curricular offers, such as specific entrepreneurship related competences. The same is true for the categories of "contents", "methods and media", "informal evaluation of learning outcomes and feedback for students" and "using results of entrepreneurship research". From the offers, selected interesting formats will be described shortly concerning all aspects mentioned above, in the following. The description is a combination of available documentation and the gathered information during the study. The descriptions also take into account the aspects described in chapter 3.2.4.

First, a complete programme, the Social Intervention, Innovation and Social Entrepreneurship Master will be presented. Afterwards, four single interesting courses will be exposed.

Social Intervention, Innovation and Entrepreneurship Master¹⁰

Target group:

Students with a Bachelor's degree in: Economy, Social Work, Sociology, Anthropology, Social Sciences, Social Psychology, Management and Engineering. Practitioners from the field of social intervention, current and prospective social entrepreneurs. In the academic year, 2014/15 about 70% are international students from South America, especially from Brazil. Thirty students per year.

Story:

In the year 2009, the Faculty of Psychology and Educational Sciences proposed to the Faculty of Economics to create a Master in Social Entrepreneurship. The third sector, the non-profit economy, has a long tradition of informal solidarities. There was a raising awareness that the social economy did not work as it should. For example, the social interventions by several NGOs did not have the intended efficacy. Therefore, innovation was necessary. In co-operation with the Faculty of Economics they started to develop the Master Programme with an innovative vision of social intervention. It resulted in a Master's programme with duration of 4 semesters (120 ECTS), jointly organised by the Faculty of Psychology and Education Sciences and the Faculty of Economics of UC with having a coordinator in both faculties. In the year 2013, the programme was approved by the Government.

General Objectives:

The Master aims at encouraging and consolidating analytical skills, as well as planning and social intervention capacities, to enable the emergence of creative, reflexive and socially sustainable initiatives addressing issues such as social vulnerability, social exclusion, precarisation and socio-economic and cultural inequalities.

To that endeavour, the training programme is embedded in an interdisciplinary and pragmatic philosophy, emphasizing innovation and social impact through social entrepreneurship. It privileges the development of approaches based on the strategic combination and management of intervention in social welfare for the common good, the optimisation of economic and social resources and the coherent articulation between public, private and not-for-profit sectors."¹¹ As interviewees stated they are aiming at a collective process that can put together different stakeholders to efficiently organize and establish social interventions and innovations. Students develop a critical thinking about social politics and its trends and future perspectives. They know about the importance of sustainability.

Curricular Units:

Fields of Social Work, Sociology, Psychology, Applied Informatics and Research Methodology. The studies plan comprises nine compulsory curricular units and an elective curricular unit:

1st Year: Society, Innovation and Entrepreneurship, Social Policies and Citizenship, Change and Strategic Planning, Elective Curricular Unit, Intervention Paradigms in Contemporary Society, Management and Evaluation of Social Programmes and Projects, Decision, Risks Management

¹⁰ For a short presentation of the program see: DG EDUCATION AND CULTURE (2011). Order 129: Mapping of teachers' preparation for entrepreneurship education. Framework Contract No EAC 19/06, Final Report. Submitted by GHK, p. 116. See also <https://apps.uc.pt/courses/en/course/921>, last access 17/05/2015 and <https://mestradoisie.wordpress.com/english/>, last access 17/05/2015.

¹¹ See <https://mestradoisie.wordpress.com/english/>, last access 17/05/2015.

and Opportunities, Deeply Discussed Issues of Research; 2nd Year: Contexts and Practices of Social Entrepreneurship, Laboratory of Applied New Technologies, Dissertation or Project Report.¹²

Locations and timing:

This Master's Degree is organized into 4 semesters, corresponding to a total of 120 ECTS.

Formal evaluation:

Written or oral exam, tests, written or practical assignments, as well as individual or group projects that may have to be orally defended and students' participation in classes. Assessment of each curricular unit may include one or more of the mentioned assessment elements.¹³

Teachers:

Staff from the Faculty of Psychology and Education Sciences with theoretical and practical background in Social Work and Social Policy (4) as well as staff from the Faculty of Economics, especially from the area of Sociology (5). Staff from IPN and DITS as invited speakers or permanent guest lecturers to cover the issues of entrepreneurship (about 15).

Learning Outcome:

One example: At the end of the first edition, in 2010, a social incubator was created, with a physical space in the Faculty of Economics. Students assess NGOs and private companies, the former to help them to be more efficient, the latter to raise social awareness and to be more productive in the social area. Students seek and support public-private-partnerships.

Perspective for the future: Interviewees states that they want to deepen international contacts with other European Universities and that they want to develop further social entrepreneurship as a field of research.

Innovation and Management Processes (mandatory)

Target group: Bachelor students of the Faculty of Sciences and Technology, from the area of informatics engineering in their third year, 90-100 students per year subdivided in around 17 projects.

Objective: Students get into deep what is innovation. They get the idea from a market perspective, they figure out something new using creativity and originality. They transfer the new idea in a business model. They launch the idea and develop real advertisement (e.g. in a public newspaper).

Content: Bases of start-up management bases of innovation, tools of business generation and modelling using the business canvas model, lean start-up, open innovation, disruptive innovation, intellectual property, marketing for start-ups, start-up financing, e.g. crowd funding.

Methods and media: Teacher centred presentations of contents, lectures, dialogue oriented approach in the theoretical part, group work in the class and mostly outside the class in the practical part; presentation of ideas in a pitch; platform with relevant information.

Locations and timing: The course takes place in seminar rooms at the IPN, four hours per week, subdivided in a theoretical part and a practical part with two hours each.

Informal evaluation of learning outcomes and feedback for students: Continuous feedback during the practical group work.

Formal evaluation: Subdivided in two parts with ten points each: a written exam and an evaluation of the project (idea and innovativeness, execution and report on activity).

Entrepreneurial New Ideas (compulsory, since 2008, with credit points)

¹² See <https://apps.uc.pt/courses/en/course/921>, last access 17/05/2015.

¹³ See <https://apps.uc.pt/courses/en/course/921>, last access 17/05/2015.

Target group: Bachelor students of the Faculty of Sciences and Technology, from the area of informatics engineering in their 3rd year, 30-40 students each semester.

Objective: Students understand the significance of innovation. They are able to develop innovative ideas. They observe and understand the market and political and social trends. They develop a questionnaire to evaluate the market potential of a business idea. Students select the best business idea to develop further. They analyse the opportunities and difficulties in different industries. Students understand and analyse existing business plans.

Content: Divided in five Modules. Module I: A few notions of entrepreneurship (entrepreneurship as question of attitude, different types of entrepreneurship, basic ideas of the Global Entrepreneurship Monitor). Module II: Idea development (market analysis, political and social trends). Module III: Continuation of idea (questionnaire). Module IV: Industrial Analysis (product life cycle; opportunities in each industry). Module V: Business plan (element of the business plan, intellectual properties).

Methods and media: Partly teacher centred presentations of contents, lectures with examples, dialogue oriented approach. Practical application by the students: group work in the class, students observe the market at an individual level, students develop a questionnaire in group-work, they implement the questionnaire in their personal environment; lectures of invited entrepreneurs and experts from the team of DITS.

Locations and timing: The course takes place in seminar rooms of the Faculty of Sciences and Technology, four hours per week.

Informal evaluation of learning outcomes and feedback for students: Continuous feedback during the practical group work and sessions.

Formal evaluation: Concept statement, inquiry, summaries of scientific contributions and studies, final written exam.

Technological Innovation and Entrepreneurship (mandatory)

Target group: Master students of the Faculty of Sciences and Technology, area of physics engineering, biomedical engineering; open to students of all other faculties (for credits), 70 students each semester.

Objective: Students think and behave as entrepreneurs in their day-to-day life. They develop a business idea and a value proposition using creativity tools. They negotiate with suppliers, investors and clients.

Content: Customer development, lean start-up methodology, business model canvas, basics of marketing, especially flyers and leaflets, budget sheet, idea pitch.

Methods and media: One hour per week fundamental knowledge by teacher centred presentations of contents. The rest of the time: practical application in groups of three (e.g. talk to potential customers or partners), role-plays (to obtain negotiation skills and creativity tools), development of ideas, selection of the six best ideas by pitching in front of all students. Those ideas are developed further into virtual companies during 10-12 weeks. Presentation of all the materials in a final session with a jury with members of the team of DITs, the president of the business angel network of Portugal etc.

Locations and timing: The course takes place at the UC main campus, four hours per week.

Informal evaluation of learning outcomes and feedback for students: Three times a semester students present the progress of their project to the whole class. Continuous feedback during the practical group work and sessions by the teacher.

Formal evaluation: 70% based on several activities (presentation of the idea, the financial model of the company, executive summary, the prototype, flyers, final session; 30% based on a written test.

Entrepreneurship and Business Challenge (compulsory, with credit points)¹⁴

Target group: Students at Master level at the 2nd year from the disciplines of medicine, pharmacy, architecture and tourism, 30-35 students per semester.

Story: In the academic year 2010-11 students were claiming for entrepreneurship courses. The triggering event was the pressure from students (student union), supported by the vice-rector. The course was integrated in the re-accreditation of the study course.

Objectives: Students relate knowledge from different areas and technical skills, such as identifying business opportunities, assess its potential and develop further a business plan, with the goal of supporting new entrepreneurs to start their own projects, turning knowledge into sustainable businesses with product and services-oriented ideas.

Content: From the entrepreneurial spirit to the business challenge, from idea to business concept, market and competition, characterization of the products and services, outlining value propositions and business plans, defining a strategy, operations, investments and financing, people, legal aspects of business creation and Intellectual property, economic-financial viability. Additional topics related to students business plan, namely innovation, communication, negotiation and evaluation of business risks.

Methods and media: Teacher centred presentations of content, as well as a "lab", a tutorial learning process, where students divided in groups have a specific task to fulfil. Final presentation of the project.

Locations and timing: Three hours per week in rooms of the Faculty of Economics.

Informal evaluation of learning outcomes and feedback for students: The evaluation shall include continuous monitoring of compliance with interim targets for implementing the project as well as presentation and discussion of the project at the end of the semester. It will be also assessed the final document that include all the components proposed by advisors. All groups have a teacher responsible for supervising and monitoring performance throughout the semester.

Formal evaluation: Final presentation and business plan.

Teachers: Students are accompanied by a multidisciplinary team of teachers.

3.2.4. Setting of curricular activities

Locations and timing

Entrepreneurship teaching takes place in different places. The majority of courses take place in classrooms at the university. Some of the entrepreneurship courses take place in the summer as well as in the winter term. All of them follow the "traditional" slot of 90 minutes (two hours) or 180 minutes (four hours). Students are sometimes invited to use special rooms as the Social Incubator. Students choose individually their locations for group work outside of the university.

See chapter 3.2.3 for detailed descriptions of selected examples.

Formal evaluation of learning outcomes

Despite the existence of substantial information, it was not possible to extract the mechanisms for feedback and adjustment. From the overall offers there are selected interesting formats, which are described in detail concerning all relevant aspects in the previous section.

3.2.5. Instructors, teachers and mentors

The academic teachers of innovation and entrepreneurship at the Faculty of Sciences and Technology have a technical sciences background, such as mechanical engineering, industrial

¹⁴ See http://www.uc.pt/candidatos/unidades_curriculares_isoladas/feuc/empreendedorismo, last access 17/05/2015. The description is partly taken from an official course overview in Portuguese, translated to English.

engineering, chemical engineering etc. Concerning entrepreneurship, entrepreneurial ideas, and innovation they acquired the knowledge independently and developed further it by doing the courses. They analysed good practice in other universities and adapted the courses to the specific needs of UC students.

Teachers of the Faculty of Economics have a scientific background on economics and business administration and one of them on engineering. Teachers of the Faculty of Educational Sciences and Psychology have their respective PhD background and acquire gradually knowledge concerning entrepreneurship (see section 3.2.3) They co-operate with staff of the Faculty of Sciences and Technology, the Faculty of Economics and DITS.

In spite of several activities at UC, some interviewees state that they do not have lot of faculty members teaching entrepreneurship (Faculty of Sciences and Technology)

Otherwise, see chapter 3.1.3.

3.2.6. Management of Entrepreneurship Education

Teacher and trainer management and evaluation of courses and programmes

Interviewees state that there is no specific teacher and trainer management concerning Entrepreneurship Education. UC has a general system of pedagogical quality management that engages teachers to reflect upon contents, methods, and the impact of teaching including a student survey. The coordinator of each programme writes a report each semester including a SWOT-analysis concerning the programme and a proposal for future improvements.

In the Social Intervention, Innovation and Entrepreneurship Master, additional to the university wide pedagogical quality management system, the involved teachers developed an approach to better the programme continuously. The involved staff realized that the students in this programme are very different concerning their competencies, academic background and their national origin. Therefore, they established an evaluating commission of two professors and two students of the programme to better the communication between students and teaching staff. All teachers of the programme meet twice a semester to discuss pedagogical questions as well as the results of the common student survey and think about changes and new strategies. They report to the commission.

To continuously better the courses, teachers from the Faculty of Sciences and Technology informally stay in contact with other teachers, e.g. with the staff of the associated poly-technical schools.

A first official meeting of entrepreneurial teachers from Portuguese universities took place in April 2015, dealing with issues among others, teaching and learning arrangements (e.g. entrepreneurial projects, simulation games) and general aspects, such as attitudes and motives, entrepreneurial competencies involving international experts.¹⁵

Internal and external network management

The internal network management is the result of the past two decades. At the beginning the close co-operation between the Faculty of Sciences and Technology, the IPN and the rectorate and after its establishing with the DITS, step by step integrating members of other faculties. The network is informal and continuously developing.

DITS maintains the contact to alumni from DITS and from alumni from the Faculty of Sciences and Technology integrating them regularly as invited professors or members of juries etc.

For external network management see section 3.5.

Management of curricular integration and attracting new groups of students

Right at the beginning, single teachers offered entrepreneurship courses for the personal awareness of the importance of entrepreneurial thinking and behaviour and this created the first demand. In a second phase, several motives can be extracted to actively develop further the

¹⁵ See http://jornadas.ipn.pt/?page_id=305, last access 17/05/2015. Involved international experts Alain Fayolle and Paul Hannon.

courses and activities: (1) An increasing unemployment resulted in a different mindset in Portugal and Europe towards entrepreneurship, (2) pressure of students respectively the student's union, demanding such offers and (3) the faculty staff became aware of the importance of the issue. Today, entrepreneurship in Portugal is a very trending area.

3.3. Extra-curricular activities related to entrepreneurship education

3.3.1. Overview about extra-curricular entrepreneurship activities

University of Coimbra puts in place various extra-curricular initiatives. Some of the initiatives are innovative and several of them are based on and adapted from best practices identified worldwide through other institutes, such as Sophia Antipolis, Singapore, Berkeley, Cambridge, Campinas (Brazil), MIT, etc.

UC developed a framework, an entrepreneurship pipeline (innovation ecosystem Inov C: <http://www.inovc.pt/>), and several other initiatives for the various stages of development and maturity of the entrepreneurial projects.¹⁶ Most of them are based on and adapted from best practices identified worldwide; some of them result from proactive work and others are embraced by the ecosystem.

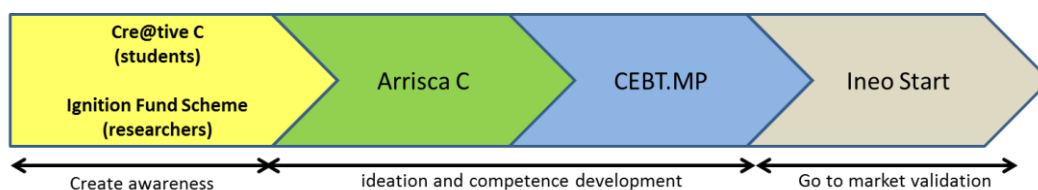
The following list gives an overview over the most important ones:

No.	Name	Objectives	Target group	No. of participants in 2013
1	Cre@tive C initiative	Students experience by simulation typical situations of an entrepreneur's life and recognize the different sources of business ideas. Participant self-assess their entrepreneurial skills.	Students of the first or second year of Bachelor	276
2	Ignition funds	Participants became aware of the potential of R&D results and do a very early assessment of R&D results commercial potential.	Professors and researchers of universities and poly-technical institutes of the Inov C region	73
3	ARRISCA C	National contest on business ideas, business plan.	Everyone can apply as long as the submitted projects would be established in the region	380
4	CEBT-MP – Technology Based Entrepreneurship Course – Mentoring Programme	Develop technology based business value propositions based on university active patents or research results	Open to students, researchers but also company workers	101
5	Ineo Start	Participants fine tune their business plan or value proposition and present them in several pitches to mentors during the process and at the end of the programme to a pool of business angels and venture capitalists	Entrepreneurs that have already a mature business plan and are almost starting their business	14 projects

¹⁶ See Strategic Program INOV•C – The Innovation Ecosystem of the Centre Region of Portugal, Internal strategic paper, 2012, page 3.

6	Technology scouting network in the academia	To spot promising technologies and promising entrepreneurs.	Everyone can apply as long as the submitted projects would be established in the region	10
7	Support to local and regional stakeholders.	Promotion of the vision of the programme itself	Any regional and local entrepreneurial agent can submit to Inov C proposals	More than 30 projects

UC put five of those activities in the following initiative sequence:



Here are some more details about the above mentioned initiatives:

- Cre@tive C initiative¹⁷ works as a 5 challenges online contest but also as a self-assessment for new students to experiment if they have 5 skills generally related with entrepreneurial spirit (strategic thinking, marketing and communication, creative problem solving, planning and business intelligence) (2nd edition started march 2014 with a new added challenge focusing social entrepreneurship). Cre@tive C is described more in detail in section 3.3.3,
- 10.000€ ignition funds for researchers to do a very early stage commercial and entrepreneurial valorisation activities with their R&D results. Target Group: professors and researchers of universities and poly-technical institutes of the Inov C region. Jury: executive board of Inov C in the first phase and the Inov C-board in the second phase for final selection. Selection criteria: commercial potential, no financing by other public funds so far. The winners use the money carry out market studies, to further develop a proto type in vitro and in vivo testing, patenteability analysis, to buy components for further tests etc.
- ARRISCA C¹⁸ (former ARRISCA Coimbra), national contest on business ideas, business plan (already in the 7th edition), started in 2008 as an business idea contest involving only students of the University of Coimbra and is nowadays one of the biggest contests with national reach and an average of 200 submissions and 400 participants each year. The contest involves more than 20 regional and national partners and total prize money of about EUR 150.000€ from regional companies co-financed by public institutions, including the EU. (Novelty aspects of this initiative: an award given specifically for final secondary school students.
- CEBT-MP, Technology-based entrepreneurship course – Mentoring Programme¹⁹: Open to students, researchers but also company workers. A three month mentoring course where the participants, organised in teams of five, develop technology based value propositions

¹⁷ See <http://www.creative-c.org/>, last access 27/11/2014.

¹⁸ See (http://www.uc.pt/gats/eventos_e_iniciativas/a_decorrer/Arrisca_C_2013, last access 27/11/2014; <https://www.facebook.com/ArriscaC>), last access 27/11/2014.

¹⁹ See <https://www.facebook.com/CEBTEMP>, last access 27/11/2014.

based on university active patents. After a public presentation investors assess the final work. CEBT is described more in detail in section 3.3.3

- Ineo-Start²⁰ (3rd edition): Specially designed for entrepreneurs that have already a mature business plan and are almost starting their business. It's a programme designed to allow them to fine tune their project with the help of mentors and tutors and present them in a pitch at the end of the programme to a pool of business angels and venture capitalists. Ineo Start is a programme for the community. Therefore, people from all over the country are invited but most of the participants are from the university. 20-50 participants per edition. The programme takes place in the IPN during a weekend. Originally organized in co-operation with five other Universities in Portugal. Afterwards organized independently from each other, now with a regional focus. Organised by UC together with the IPN-Incubator and the Faculty of Economy, Junior Enterprise (JEKnowledge). Mentors are from regional and national companies and institutions. Perspective for the future: Teams have to apply for the programme and the programme will be extended to a two-month period.
- Technology scouting network in the academia to spot promising technologies and promising entrepreneurs. A researcher was trained in each R&D group about the major do's and don'ts on IP and protection of R&D results. These researchers work in close collaboration and articulation with the Knowledge Transfer Units in the region.
- Support to local and regional stakeholders. Any regional and local entrepreneurial agent can submit to Inov C proposals to foster entrepreneurship in its geographical area of intervention, see section 3.5.1.

3.3.2. Target groups of extra-curricular activities

From the deep insight of the activities, it can be concluded that extra-curricular activities address two categories of persons. First category: Persons with high interest in starting a company, who seek to test their entrepreneurial propensity, and gain a deep insight in entrepreneurial behaviour. Second category: Persons who are already deeply interested in starting a company and want to develop further their idea or exploit their research results and establish a company. The target group for each activity is laid down in the respective materials and internet sources.

Bridges to secondary education

DITS is developing an initiative with students from the final year of secondary schools, trying to adapt their know-how and delivering a one afternoon workshop for schools, called Vending Machine, helping them to foster entrepreneurship awareness. Students have to develop a business idea and have to get feedback on it in the closest shopping mall. They develop a prototype and at the end, they present the idea. The model is still work in process.

Regarding primary and secondary school, the university is also offering 25 hours training courses for teachers related with entrepreneurship education.

Arrisca C (see above) has an award given specifically for final secondary school students.

Interviewees recommend starting teaching entrepreneurship in secondary education or even earlier, on a voluntary basis.

3.3.3. Designing extra-curricular activities

From the rich body of activities, the programme CEBT-MP, a Technology-Based Entrepreneurship Course - Mentoring Programme, and Cre@tive C are described more in detail, for having the character of learning programme and partly of self-assessment.

²⁰ See http://www.uc.pt/gats/eventos_e_iniciativas/a_decorrer/ineostart), last access 27/11/2014; [weekend.ineo.pt](http://www.ineo.pt), last access 14/05/2015.

Technology-Based Entrepreneurship Course – Mentoring Programme (CEBT-MT)

Story: CEBT-MP²¹ is already in his 9th edition (first edition in 2005). CEBT-MP was developed further from edition to edition. One example: The need for more participants and critical mass was the triggering event to co-operate with the other universities of the centre region of Portugal (University of Aveiro and University of Beira Interior). CEBT-MP is co-organised together by the three universities and the Centre of Portugal Chamber of Commerce and Industry. In the year 2008, CEBT-MP was awarded in the category of programmes fostering entrepreneurship at the national phase of the European Enterprise Promotion Awards. Considering the success of this initiative, the last two editions of CEBT-MP were held also in the closest Spanish universities of Castilla y León region: Universities of Salamanca, Valladolid and León.

Target group: At the beginning of the programme: about 50% of the participants were staff from companies. Today the course is open to students (approx. 70%), researchers (approx. 15%) and company staff (approx. 15%). Participants have to apply for the course and are selected by DITS. Total number of participants: In average, 100 participants attend this course divided by the three universities. More than 1000 participants already attended the course.

Objective: Participants learn about a specific patented technology. Participants develop strategies of opportunity exploitation and develop technology based value propositions based on university active patents. They know the elements of a business plan, they use the categories of the business plan and the business model canvas to develop a technology based business model. They write a business plan, and present their business model to a pool of investors. Participants act as corporate entrepreneurs.

Content: Several documentation concerning a given technology. Documentation and tools together with periodical deliverables that students develop for a given technology with tutor and the inventors support.

Methods and media: Participants are gathered in multidisciplinary teams of 5-7. A digital platform is managed to help the teams to gather information and share it with tutors and mentors. Lectures concerning different fields of knowledge and mentoring sessions are given.

Locations and timing: A three months course with weekly sessions of three hours in seminar rooms of the DITS. The groups meet on a voluntary basis in other locations. *Lectures* take place separately in the three universities but there are 3 sessions (the first, the midterm and the last one) that are held together in one room with all the participants.

Informal evaluation of learning outcomes and feedback for students: Mentoring and continuous feedback to the groups.

Formal evaluation: Assessment by a jury of investors and members of different companies. They give points from one to five concerning different criteria. The best business plan is awarded with a symbolic prize (a trophy and diploma).

Teachers and mentors: Hired teachers for specific topics from outside the university, staff members of DITS act as consultants and coaches.

Remarks: Participants get a university certificate. Participants pay a fee. All participants sign a non-disclosure agreement to prevent disclosure of eventually confidential information about R&D results.

Cre@tive C

Story: The first idea of Cre@tive C²² was to invite successful entrepreneurs to share their history with students in class in a three-hour event. Afterwards students got the possibility to select between several options of how the presented problem could have been solved. The “real” entrepreneur finally explained why he took which decision. For organizational reasons the activity was changed into an online-contest. (First edition in 2011, second edition 2014).

²¹ See <https://www.facebook.com/CEBTMP>, last access 27/11/2014.

²² See <http://www.creative-c.org/>, last access 27/11/2014.

Although being a contest, the main focus is still the solving process of given challenges and the respective learning process.

Objective: Students recognize the different sources of business ideas. They are able to express a value proposition in a short text or in a 1-minute video. They recognize the critical importance of values, ethics and social responsibility in entrepreneurial activities. They are able to face different entrepreneurial situations. They are aware of their creative problem solving potential. They experience by simulation typical situations of an entrepreneur's life and are able to identify and use patents and trademarks databases/search-engines. They pitch their ideas.

Content: Creativity and originality (I), marketing (II), problem solving (III), strategic management (IV), business intelligence (intellectual property) (V), social entrepreneurship (VI)

Methods and media: Students form teams and register online. They perceive five different challenges concerning the contents I to V (see above), e.g. "Create a new product around a tea-bag". Within around 10 days they solve the challenge (by a written exposé, a short film, a presentation) There isn't any involvement of teachers or mentors during the process. DITS develop the challenges and rank the results.

Target group: Students of first or second year of Bachelor, around 100 participants

Locations and timing: Locations outside the classroom chosen by the students, there is a due date for every challenge but time management is completely in the student's responsibility

Informal evaluation of learning outcomes and feedback for students: None, except a classification from one to 5 of the deliverables for each challenge.

Formal evaluation: The teams are ranked after each of the five challenges and the winner team of each challenge gets 100€. Finally there is an overall ranking and the best team wins 1500 EUR, the second best 1000 EUR, the third one 500 EUR.

Teachers and mentors: three staff-members of DITS and invited experts

Remarks: Inscription is free. Prizes are sponsored by INOV C programme. Teams cannot accumulate more than a 100€ prize in the challenges. Therefore, if the same team wins two or more challenges they have to designate a local social institution to whom they wish to donate the surplus

3.3.4. Setting of extra-curricular activities

Locations

The locations vary regarding the different activity. Several activities take place in DITS or IPN facilities, but some take place outside the university and chosen deliberately by the participants.

Timing

Only few activities have a detailed time. Very often, to elaborate a challenge, a period of time is defined or deadlines are given.

Formal evaluation of learning outcomes

Nearly all of the activities end with a presentation of results to a jury of internal or external board of experts. Results are ranked and prizes are given.

3.3.5. Persons involved in extra-curricular activities

The whole staff of the DITS (about ten persons) is organizing and supporting the different extra-curricular activities. Some of the persons have more than ten years of experience in fostering entrepreneurship at universities. Most of them with experience within the university in the area of SME promotion and development, and some with experience in student companies, such as JEEFEUC or JEKnowledge (see above) and still being involved in their work as member of the advisory board. In some formats, e.g. CEBT-MP, additional teachers and mentors are hired. Usually the mentors also have companies and market experience and/or helped several

entrepreneurs to create very successful businesses. Some of them participated in former times in UC extra-curricular activities by themselves.

Evaluation of extra-curricular offers

UC favours learning by doing and continuous improvement approaches. The adoption of new models, such as the lean start up and business model canvas and validation board approaches in some of the initiatives resulted in changing the more classical business plan or value proposition into more visual, appealing and interactive outputs.

3.4. Institutional aspects of entrepreneurship education

3.4.1. Organisational set-up and change

INOV C is led by the University of Coimbra. UC and its other nine core partners (the university, polytechnic schools, its incubators and science parks) together form the Inov C council, the strategic decision board of the ecosystem. Under the board, there is the Inov C executive board formed by one executive representative from each of these partners that implement the defined actions. All the 600 regional stakeholders form a kind of a general assembly.

3.4.2. Laws, statues and codes

Inside the University, a “Strategic Plan 2011-2015” was developed for all the university, and entrepreneurship and innovation is an important pillar of that strategy (see section 3.1.2). Most of the extra-curricular initiatives are promoted, supported, or followed by DITS and the curricular activities are still somehow lacking some integration and coordination. The UC plans to organise a meeting with all the teachers in the university that give classes somehow related with entrepreneurship to start the communication process in the academy.

3.4.3. Mindsets and attitudes

UC developed, together with 25 major Iberic and Latin-American University partners, a formal network called RedEmprendia promoted by the Spanish bank Santander.²³ Several initiatives to promote and deploy good practices have been put into place.

For example:

- An annual call for teachers and researchers to attend a Babson College training course about teaching entrepreneurship.
- Publications about good practices related with university 3rd mission initiatives, benchmark performance indicators, etc.²⁴
- A programme between all the incubators of the associated universities for accelerating spin-off internationalization using a soft landing programme²⁵
- A “learning to become an entrepreneur” programme, where university students with a business proposal can do an internship in a spin-off company with core competencies in that scientific domain.²⁶

²³ See www.redemprendia.org, last access 04/05/2015.

²⁴ See <http://www.redemprendia.org/pt/servicos/publicacoes>, last access 04/05/2014.

²⁵ See <http://www.redemprendia.org/pt/landing/inicio>, last access 04/05/2015.

²⁶ See <http://www.uc.pt/gats/redes/RedEmprendia/PNE>, last access 04/05/2015.

3.5. External relationships related to entrepreneurship education

3.5.1. Types of relationships with external stakeholders

In general, UC in its leading role in Inov C has close relationships to local and regional stakeholders: Any regional and local entrepreneurial agent can submit to Inov C proposals to foster entrepreneurship in its geographical area of intervention. As long as it is aligned with the overall ecosystem vision and has a good merit assessment, Inov C co-finance the initiative up to 10.000€. With this Inov C already promoted more than 30 projects, very different in their nature and objectives (entrepreneurship for young citizens at risk; a rural entrepreneurship project; the training and tutoring of workers to start entrepreneurship offices inside local municipalities, municipal foreign direct investment, etc.). This initiative has turned out of great strategic importance and impact promoting not only local and specific initiatives but also as a promotion of the vision of the programme itself and the diversity of activities that are taking place. Recently a survey was ran for the promoters of this projects and it turned out a global average of 89.25% satisfaction.²⁷

Concerning the field of teaching, UC has different types of relationships in which the university engages with external stakeholders:

Type 1: Former members of the Faculty of Sciences and Technology with successful companies teaching each semester a complete course at UC.

Type 2: Integration of stakeholders in single sessions or single activities: Employees of companies, company founders or members of external institutions (e.g. the president of the Business Angel network of Portugal) are invited to final course sessions as members of the jury (curricular activities). Entrepreneurs with recently founded companies are integrated as role models in in single sessions (curricular activities). Employees of companies, company founders or members of external institutions are invited to rank and evaluate the performances of participants of extra-curricular activities.

Type 3: Innovation projects of students doing their thesis in the company programme 'PHD in the Company' throughout Portugal.

Type 4: At a more general level, periodically Inov C organises an informal major meeting with around 100 regional stakeholders. The event that usually starts with a motivational activity and afterward, participants are organised by tables that lead discussions on different themes related to regional innovation and entrepreneurship. Afterward, the most important three issues and suggestions from each table are shared into a big mind map that is used to readapt the planned strategy.

3.5.2. External stakeholders involved in entrepreneurship education

In general, the relationships with external stakeholders are intensive especially due to the Innovation Ecosystem project Inov C. This project follows the vision "to transform centre region of Portugal in an international reference for the knowledge creation, innovation and entrepreneurship, in order to improve the position of the Central Region and enter in the **100** most innovative regions of Europe in **2017** under the Regional Innovation Scoreboard."²⁸ Inov C consists of the ten core partners, UC, Polytechnic Institute of Leiria, Polytechnic Institute of Coimbra, Pedro Nunes Institute, Pedro Nunes Incubator, D. Dinis Incubator, Biocant Park, ITCons, Coimbra Innovation Park and Óbidos Technological Park. UC is the leader of the consortium. DITS is member of the executive board and has therefore a central position in the network.

Enterprises

Several of the described activities involve external companies and entrepreneurs that help in assessing, mentoring, tutoring, networking and investing in the entrepreneurial projects. Ineo

²⁷ Internal information.

²⁸ Frequently used PowerPoint-Presentation on the Innovation Ecosystem, slide 4, not published.

Startup for instance, is organised once a year and external stakeholders suggest running it twice a year because they like the concept. An external panel to assess the quality and potential of invention disclosures has been in preparation.

Incubators, accelerators, science parks and technology parks

The relationships to these institutions are very close. Due to the history of Entrepreneurship Education at the UC (see section 3.1) and the UC leading role in the Innovation Ecosystem Inov C, UC has intensive and lively exchange with Pedro Nunes Institute, Pedro Nunes Incubator, D. Dinis Incubator, Biocant Park, ITCons, Coimbra Innovation Park, and Óbidos Technological Park which helps to continuously better especially the extra-curricular but also the curricular offers.

3.5.3. International relationships

UC developed, together with 25 major Iberic and Latin-American University partners, a formal network called RedEmprendia promoted by the Spanish bank Santander.²⁹ Several initiatives to promote and deploy good practices have been put into place. For examples see section 3.4.3.

3.6. Impact and lessons learned

3.6.1. Evaluating impacts of the entrepreneurship education approach

Overview of impact evaluation methods applied

One goal listed in UC's Strategic Plan 2011-2015 is as follows: "Positioning Portugal's central region among those rated as "Average Innovator" in accordance with the regional Innovation Scoreboard."³⁰ There are ten performance indicators mentioned regarding this goal, which include: "no. of technology-based spin-offs and start-ups; no. of entrepreneurship and innovation projects in the consortium".³¹

The actual numbers indicate:

- 180 companies with a total turnover of around 80M€ created in the last two decades
- 10 entrepreneurship and innovation projects in consortium in 2011 and 43 in 2013.³²

In order to investigate the innovativeness and entrepreneurial spirit of students, the 'Survey on Entrepreneurship Student – IE' was carried out by Inov C, targeting students from universities of the Inov C region, i.e. Inov C University of Coimbra (UC), Polytechnic Institute of Coimbra (IPC) and Polytechnic Institute of Leiria (IPL). 1,764 students out of a total of 47,603 responded. One striking result was that 47% of the students wanted to be self-employed and the motivating factor was their wish of self-fulfilment (59%). The biggest fear indicated by students thinking of starting a company was uncertain earnings (62%) and the current economic problems (61%).³³ The responses from the survey allow DITS to monitor attitudes, thoughts, opinions and experiences of students related to entrepreneurship and help to strategically develop the programme. The results of the survey were compiled and largely disseminated.³⁴ The survey is run periodically and its objective is to monitor major trends.

UC itself carried out a survey of its alumni who had become entrepreneurs.³⁵ According to this survey, 60% of the companies created by UC alumni are settled in Coimbra³⁶. One of the

²⁹ See www.redemprendia.org, last access 04/05/2015.

³⁰ University of Coimbra: Strategic Plan 2011-2015, without year, page 33.

³¹ University of Coimbra: Strategic Plan 2011-2015, without year, page 33.

³² Data from internal surveys that are carried out in incubators and in other companies.

³³ See <http://www.uc.pt/gats/IE3/documentos/estudo>, page 3; last access 15/05/15.

³⁴ See <http://www.uc.pt/gats/IE3>, last access 15/05/15.

³⁵ See UNIVERSIDADECOIMBRA, Divisão e Inovação e Transferências do Saber: Roteiro do Empreendedorismo da Comunidade da Universidade de Coimbra. Julho 2010.

³⁶ UNIVERSIDADECOIMBRA, Divisão e Inovação e Transferências do Saber: Roteiro do Empreendedorismo da Comunidade da Universidade de Coimbra. Julho 2010, p 32.

biggest influences on choosing the location of the company was the quality of life in the region.³⁷

In the periodical meeting with all the 600 regional stakeholders of the innovation ecosystem, Inov C presents the main achievements of the project and its plan for the future. It aims to address and accommodate all stakeholder suggestions and a survey is used to quantitatively assess stakeholder satisfaction with the region's innovation and entrepreneurship development and progress. The last survey was carried out in 2013, with an assessment score of 3.7 score (on a scale from 1 to 5).³⁸

The impact of the ignition fund initiative (see above) that supported 53 ignition grants was also monitored. Each applicant had the opportunity to leverage public and private capital six times higher than the value of the overall ignition fund. The overall results from the survey showed that 74% of the applicants were satisfied by the initiative and its outcome.³⁹

In order to analyse the impact of UC's initiative, one possible indicator is the transferability of these initiatives to other universities. The interviewees consider the transferability to be high. For instance, the Technology Based Entrepreneurship Course has been adapted by other regional universities. The model itself has been the object of study at other universities in Angola, Argentina, Morocco, Brazil, Macau and S. Tomé and Príncipe.

3.6.2. Lessons learned

Summary of lessons learned from this case

Research for this case study leads to the following lessons learned;

The extra-curricular offers – whether they were initially designed to cover the needs of students in the ignition phase or of nascent entrepreneurs – sensitize the University as a whole, as well as students, for the area of entrepreneurship. As students pointed out, **extra-curricular activities** such as the Junior Student Enterprises **help to raise awareness for entrepreneurship** and this helps students to understand the objectives and contents of curricular offers, such as the entrepreneurship courses offered by the Faculty of Economics.

As students stated in the interviews, the university classes in the field of engineering and economics before 2009 had a theoretical focus and students missed the orientation towards practical application. Today, even in the standard curriculum, theoretical knowledge is accompanied by practical application. Based on this, it can be assumed that even in a traditional university it is **important to have a theoretical as well as practical approach to entrepreneurship** and management.

Entrepreneurship education in Coimbra seems to be thriving because of a **close connection between the curricular and the extracurricular elements and the entrepreneurial ecosystem**. The same trainers and teachers participate in both formats and DITS as a central unit is involved in almost every entrepreneurship activity. Extra-curricular activities are supported by the ecosystem's partners, in particular by third parties such as associations, junior enterprises, and companies. The close interconnection between the ecosystem, the extra-curricular activities, and the curricular offers are considered to "nurture the process of entrepreneurship awareness" at UC.

At UC, all persons who launched EE had entrepreneurial experience as well as a high affinity to entrepreneurship due to their close links with the University's incubator, IPN. The UC case also shows that EE educators do not necessarily need to have experience as entrepreneurs but they should have exposure to it and gain **practical experience** and specific **teaching experience**.

The Coimbra case shows the **importance of individual initiatives and top management support** for developing entrepreneurship education. The change process from a traditional, not entrepreneurship-focused university strategy to an approach of fostering entrepreneurship

³⁷ UNIVERSIDADECOIMBRA, Divisão e Inovação e Transferências do Saber: Roteiro do Empreendedorismo da Comunidade da Universidade de Coimbra. Julho 2010, p 35.

³⁸ Data from internal survey of INOV.C that have been carried out in incubators and in other companies.

Results used for internal purposes and in presentations. Not published.

³⁹ Internal information.

originated in the technical departments. One person gave the initial impulse for entrepreneurship education; a chemical engineering professor with a diverse background and experience in different cultures. He created the DITS in 2003 and “educated” the next generation of highly committed people to entrepreneurship. The change process was the result of initiative and efforts of this group, strongly supported by the rectorate, which also included entrepreneurship and technology transfer in its strategic tasks. From the very beginning, DITS was closely connected to the Rectorate.

The UC case also shows that it is well possible to **develop EE from the field of Sciences and Technology**, provided that it is supported by the university’s top management. From this base unit, EE can successively be developed university-wide. This may require very good network contacts of the EE proponents to other faculties. Alternatively, as in the UC case, such university-wide outreach can be supported by an entity such as DITS, which is already linked with all faculties for technology transfer purposes and which can also foster EE networking.

Finally, the Coimbra case shows that **creating an entrepreneurial culture is not for free** – to reach this goal it is necessary to invest considerable funds.

Perspectives for the future

As further steps to get more students and faculty members involved in entrepreneurial thinking and behaviour, some of the interviewees identify 1) to make entrepreneurship courses available to students from all faculties, 2) to start teaching entrepreneurship as early as possible in the academic careers and 3) that entrepreneurship courses should be mandatory. They propose a module of 4 ECTS with the same basic contents for all students, supplemented by a 4 ECTS module with a specialisation per faculty. Other interviewees stated that the top-down-approach is difficult. They want to expand to areas such as Humanities, in which entrepreneurship is still weak, but without forcing the offers. In these areas, successful projects could produce a role-model character. Therefore, as some interviewees recommended, it could be a solution having one responsible person for entrepreneurship in each faculty in addition to the already existing Vice Rector who is in charge of entrepreneurship.

In general, there is a need to maintain the very well organised and successful approach at UC, and extend and develop it to tackle new challenges such as a comprehensive curricular integration of entrepreneurship education.

Transferability to other universities

The co-ordination of Inov C and the resulting close contact to other polytechnic universities is a possible way of transferring entrepreneurship education.

As mentioned in section 3.3.3, the last two editions of the successful CEBT-MP were held also in the closest Spanish universities of Castilla y León region, the Universities of Salamanca, Valladolid and León.

List of Abbreviations

AAC	Associação Académica de Coimbra, Coimbra Students' Union,
BEST	Board of European Students of Technology
CEBT-MP	Technology Based Entrepreneurship Course – Mentoring Programme
DITS	Divisão de Inovação e Transferências do Saber – Knowledge Transfer Unit)
IPN	Instituto Pedro Nunes, University Incubator
Inov C	Innovation Ecosystem Ecosystema de Inovação,
JEKnowledge	Sciences and Technology Faculty Based Junior Enterprise
JEEFEUC	Junior Empresa de Estudantes de Faculdade de Economia da Universidade de Coimbra, Junior Enterprise of Students of the Faculty of Economics of the University of Coimbra
UC	University of Coimbra

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4. Dublin City University Ryan Academy, Ireland: a public-private partnership in entrepreneurship education

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Abstract



The Dublin City University Ryan Academy (DCURA) is a non-profit partnership between Dublin City University (DCU) and the Ryan Family of the Ryanair Company. The academy offers three types of curricular entrepreneurial education (EE): (1) master degree programmes for social entrepreneurs and unemployed professionals, (2) entrepreneurship training programmes for researchers, farmers and other professionals, and (3) four specific accelerator programmes for leaders from start-ups with high growth potential, for female start-up leaders, for DCU students starting a business, and for new enterprises in the payment industry. Until 2014, DCURA also offered a Certificate at Honours degree level for unemployed professionals. Hence, DCURA offers different EE programmes for different target groups with a core EE content and specific adaptations. The strengths of the DCURA partnership may be in the autonomy, flexibility and entrepreneurial spirit of the academy combining academia and practice. The main prerequisites for such a partnership to work successfully were found to comprise a shared vision, commitment and contributions of both partners including funding, and a commercial and relationship-oriented leadership.

Case study fact sheet

▪ Full name of the university and location:	DCU Ryan Academy for Entrepreneurs, Dublin, Ireland
▪ Legal status (e.g. public or private)	Private company, fully owned by DCU
▪ Year of foundation:	2005, closure in 2008, reopened in 2009
▪ Number of students:	Approximately 500 per annum (536 in 2014)
▪ Number of employees:	Six core Ryan Academy staff members Five programme-based staff members
▪ Budget in most recent financial year:	€1.4 million (2013)
▪ Academic profile:	Master programmes in social entrepreneurship and degree level business innovation, professional training programmes, and accelerator programmes in partnership with DCU.
▪ Entrepreneurial education profile:	Target group specific master programmes, EE training programmes and accelerator programmes for start-ups.
▪ Activities focused in this case study:	Public-private partnership DCU – Ryan Family: strengths, weaknesses, prerequisites for success
▪ Case contact person(s):	Gatekeeper: Ann Horan, former CEO until 2014, Eoghan Stack, new CEO starting in 2015, both DCU Ryan Academy

The status of information in this case study is end of year 2014 unless stated differently.

4.1. The university's entrepreneurial profile

4.1.1. The university's overall approach to entrepreneurship

Overall approach of the DCU Ryan Academy to entrepreneurship education

The DCU Ryan Academy (DCURA)⁴⁰ is a **non-profit public-private partnership** between the Dublin City University (DCU), Ireland, and the Ryan Family of the Ryanair Company. DCURA provides entrepreneurship and business education and training to several target groups: to leaders and employees from Irish SMEs, larger corporate firms and start-ups, to researchers from DCU and other institutions as well as to a small number of DCU students. Until 2014 there was also a training programme for unemployed professionals. DCURA offers entrepreneurship education (EE) on different accreditation levels and in non-accredited accelerator programmes. Accelerator programmes are specifically designed to support start-up development.

DCU itself does not offer an entrepreneurship education programme. However, DCU includes aspects of EE in its general business education programmes.

In 2014, DCURA had 536 students including 20 student entrepreneurs in an accelerator programme named UStart. At the time of writing this case study, UStart was the only DCURA offer in which DCU students take part. Vice versa, no DCURA participants study at DCU. However, DCURA plans to organise more EE events for DCU students in 2015.

The strengths of the partnership between DCU and the Ryan Family were found to be in the autonomy, flexibility and entrepreneurial spirit of the academy "using best of both worlds" for entrepreneurship education (EE): DCU accredits the bachelor and master level programmes at DCURA, and DCU teachers deliver modules in these programmes. DCU also provides central services for the academy such as accounting, marketing, information technology, human resources and facility management. The Ryan Family donated the building and provides funding, ideas and advice and helps crucially in networking. Additionally, it has shaped the practical, entrepreneurial and action-oriented culture in the academy.

How DCURA came into being

Originally, the Ryan Family aimed to "do something in honour of the father", Tony Ryan. The original objective was to build "a Silicon Valley" in Ireland. The inspiration for the academy came from a visit of Tony Ryan to the Massachusetts Institute of Technology (MIT) in Boston, US. Thereafter, the Ryans started a partner election process among universities in Dublin. They found DCU to be the most suitable partner, as the former DCU president agreed to start quickly, while other universities were not as supportive or refused outright.

The Academy started operations in 2005 for the first time as the only part of the eEolas Institute, a joint venture between DCU, the Ryan Family and Davy Hickey Properties. After a loss of 1.3 million euro, the Institute and the Academy were closed in 2008.⁴¹ The Academy reopened in 2009 with a new leader, CEO Ann Horan, who had a commercial background in banking. At the turn of the year 2014/2015, Eoghan Stack became the new CEO, who was previously the Chief Commercial Officer of the Academy.

Publicity of the DCURA case

The partnership between DCU and the Ryan Family is fairly well known in Ireland since the Academy has been promoted to the Irish public. However, there has as yet been no research and analysis of the organisation and the partnership as is done in this case study.

4.1.2. Leadership and governance

Importance of government strategies and policies

DCURA was established by the initiative of the Ryan Family from the private business sector and supported by DCU from the public education sector. DCURA's establishment reflects a growing interest in entrepreneurship in Ireland. While such interest was also stimulated by policy

⁴⁰ See <http://www.ryanacademy.ie>.

⁴¹ See: http://en.wikipedia.org/wiki/Eeolas_Institute#cite_note-1.

makers,⁴² there is no legal requirement to establish EE programmes in Ireland, and there was no public financial support or encouragement to establish DCURA.

Importance of EE in the university's strategy and high-level commitment

The target of fostering entrepreneurship is stated in **DCURA's vision and mission statement**: "DCU Ryan Academy is a non-profit, joint venture between Dublin City University and the Ryan Family (Ryanair) that aims to be the leading supporter of entrepreneurs and innovation in Ireland. Our vision is for an Ireland where entrepreneurship and innovation are viewed as key drivers of business success and the DCU Ryan Academy as a leading catalyst in helping to develop an entrepreneurial mind-set."⁴³

According to the President, the goals of DCURA and DCU are well-aligned. DCU and especially its Business School focus more on the general topics of innovation and business education with a target to be the "University of Enterprise" with strong links to industry partners.⁴⁴ On the other hand, the DCURA's focus on entrepreneurship is an essential part of the academy. In an interview for this case study, the DCU President stated that not all students will be entrepreneurs, but all students can be innovators and an entrepreneurial mind-set relates to that. Thus, the development of **entrepreneurship is mentioned explicitly in the official DCU strategy** document with the target of increasing an entrepreneurial mind-set among students and staff. The special topic of social entrepreneurship also constitutes a focus area.⁴⁵

How the Academy developed over the years

In the initial years following the reopening of the Academy in 2009, the vision and mission of the Academy were not as clearly articulated as they are today. Hence, it was difficult to manage expectations and wishes of both parties– DCU and the Ryan Family. Despite the statement of the former President that indicated a quick start, DCU was described as moving slowly and with less orientation towards action. The attitude within DCU changed with the new President, Prof. Brian MacCraith, in 2010. He was found to show a very high commitment to developing and implementing entrepreneurship.

Furthermore, according to the former CEO Ann Horan, in the beginning the Academy was "more outside and externally oriented". DCURA targeted participants and companies from the practical community and not students from the university. Moreover, DCURA worked exclusively with lecturers from the business world. With the new President, the strategic direction of the DCURA changed slightly. In previous years, the Academy has gradually become more "inside oriented" with the aim of leveraging the entrepreneurial skills and the experience it gained in order to educate students and staff from DCU. For this reason, the student accelerator programme UStart and the Invent Tech Venture programme were implemented for helping researchers to commercialise findings.

Level of faculties' and units' autonomy to act and organisational implementation

The level of autonomy at DCURA is high. Most decisions are taken in the Academy's management board, consisting of the CEO and the team. Formally, the Ryan Family has no decision rights. From a legal point of view, the DCU Ryan Academy is subordinate to Dublin City University. DCU's President asserted that the Academy works in an autonomous way. He mentioned that communication between DCU and the Academy's team is essentially important.

⁴² See Flanigan (2008), Cooney & Murray (2008).

⁴³ See <http://www.ryanacademy.ie/about>. Further statement: "Our mission is to promote an entrepreneurial mindset and real innovation focus among Irish SMEs, corporates, startups and researchers through a range of training, leadership and funding initiatives. DCU Ryan Academy can bridge the gap between academia and entrepreneurial practice through our unique partnership between Ireland's leading young university, Dublin City University and the family of one of our greatest entrepreneurs, Tony Ryan."

⁴⁴ DCU's mission is "to transform lives and societies through education, research and innovation" (<http://www.dcu.ie/discovering-dcu.shtml>).

⁴⁵ "Over the next five years we will: • Establish a vibrant enterprise culture in the University by developing and implementing a new Entrepreneurship Strategy, including commercial, social and cultural entrepreneurship for students and staff. • Foster the development of entrepreneurial skills in our students through a range of new initiatives including curricular and extra-curricular modules and entrepreneurial experiential learning (e.g. Student Accelerator Programme). ... • Establish DCU as Ireland's leading university for social entrepreneurship." DCU (2012), p. 23.

Declan Ryan, the son of Tony Ryan and now the main representative of the family, described the family's relationship to the Academy as being "at an arm's length", with the target of continuing this autonomy. With regard to decision-making and influence, the involvement of the Ryan Family, namely Declan Ryan, is described by interviewees as "more subtle" and indirect, such as through telephone calls, e-mails and the proposed idea of "interesting persons" being invited for an initial meeting of knowledge exchange. He himself mentioned the idea and the support for a female propeller programme and, as another example, a business trip to Chile where he was informed about entrepreneurship programmes. He then invited the responsible person for an exchange and a presentation in the Academy. An interviewee also mentioned that "it is no coincidence" that DCURA offers a programme in social enterprise and that at the same time, Ryan's investment company Irelandia Investments, engages in fostering social entrepreneurship.

The Academy's advisory group constitutes an important instrument for the communication between the stakeholders and the Academy's management team. The advisory board is composed of 25 members mainly from practice but also with several members from DCU including the President.⁴⁶ Declan Ryan is the Chairman of the Group. The group provides guidance and advice with regard to the strategic direction, support in finding funding and helps in building the DCURA's reputation. It meets three times a year. Yet, as the advisory board has a large number of members, it has been discussed to reduce the number, shifting more from "advisory" to "working and action-oriented" members. A sub-group is established that meets regularly to work on the strategy.

In essence, the academy works in an autonomous, decentralised way. However, with regard to programme offers and strategic direction, the expectations of the stakeholders, mainly DCU and the Ryan Family, have to be met and to be aligned.

4.1.3. Resources: financial capacity and people

Financial resources for entrepreneurship education

The Ryan Family donated the Academy's building as a basis for the Academy to start in 2005. After restarting the Academy in 2009 however, there was nearly no funding apart from limited support from DCU to pay the initial staff. Almost all of the Academy's income was obtained through training offers and applications for external funding for its education programmes. The small financial support at the beginning can be seen as the main influence for the Academy's entrepreneurial culture today. The DCURA had to find out for which customers they provide added value with their training offers. The Academy also rented the rooms to receive some additional income, while managing the Academy at a very low cost. Following successful applications for funding programmes, they sometimes had to react quickly in setting up the programme – e.g. the business innovation programme, involving external lecturers. The former CEO Ann Horan summed up the first years in the statement: "I suppose it is an entrepreneurial journey, isn't it?"

A major funding contribution came from the Ryan Family at the beginning of 2011 through the Tony Ryan Trust. It led to a more stable basis for funding essential staff and equipment. The funding amounted to 1 million euro in total, for four years. It was said that the Ryan Family waited some time to see how the Academy was doing before they provided basic funding. This behaviour – considering especially the Academy's leadership – can be related to the closure of the Academy due to a financial loss of 1.3 million euro in 2008.⁴⁷ In addition to basic funding, the Ryan Family financed the first venture propeller programmes with a 1 million euro investment. In fact, the funding from the Ryan Family represents approximately only one fifth of the Academy's total income. This shows that the Academy is financially rather independent from the Ryan Family.

On the other hand, DCU provides support in the central functions accounting, marketing, information technology, human resources and facility management as in-kind funding for the academy.

Human resources for entrepreneurship education

⁴⁶ See the published list at: <http://ryanacademy.ie/about/advisory-group>, 25.7.2014.

⁴⁷ See http://en.wikipedia.org/wiki/Eeolas_Institute#cite_note-1.

The Academy staff consists of six core management and administrative employees: the Chief Executive Officer (CEO), the Chief Operations Officer (COO), the Chief Commercial Officer (CCO), a personal assistant to the CEO, a receptionist and a fundraiser. Additional co-ordinator resources are hired when funding is available for specific programmes. In 2014, three programme managers and two administrative staff members were employed in addition, with the help of funding by the Springboard Initiative (Business Innovation Programme) and the MIN Intereg Fund (Social Enterprise Programme). Especially in the initial years, staff salaries were held at minimum levels because of the limited financial resources available. Due to this limitation and also in order to assure high quality and practicability of the content delivered, the academy works mainly with external lecturers from practice.

4.2. Entrepreneurship in curricula and teaching

4.2.1. Overview about curricular offers

Types of curricular EE programmes offered

DCURA’s curricular offer in entrepreneurship education comprises the following types of programmes for specific target groups:

- (1) Master programmes (Level 9 in the Irish National Framework of Qualifications⁴⁸, NFQ).
- (2) Professional training programmes (Level 6 in the NFQ or non-accredited).
- (3) Accelerator programmes specifically for start-ups (non-accredited).

Until 2014 DCURA also offered an honours bachelor degree level programme (Level 8 in the NFQ). Exhibit 1-1 provides an overview about these offers.

At **master degree level** (level 9 in the NFQ), the Academy offers a Master in Management (Innovation in Social Enterprise) for Irish and Welsh participants. In 2014 DCURA also offered Graduate Certificates in Management for unemployed professionals in Digital Marketing, Marketing for International Growth or Sustainable Energy Finance with limited EE Content. Only the programme on Sustainable Energy Finance continued in 2015.

The academy offers **professional training programmes** in Farm Entrepreneurship and Leadership, an Entrepreneurship Programme for Researchers funded by the Science Foundation Ireland (SFI) as well as a Tech Venture Programme at Invent DCU, DCU’s Innovation and Enterprise Centre. The Farm Entrepreneurship and Leadership programme is accredited as NFQ Level 6, which is an “Advanced Certificate”⁵⁰ below the Bachelor Degree. DCURA also offers a Credit Union Development Programme and a Social Enterprise Governance Programme, but these can be considered as general business education rather than EE programmes.

DCURA’s **accelerator programmes** help start-up companies to reach the next stages of development. The “Propeller Venture Accelerator” is offered for technology-based start-ups. A specialised “Female Propeller” aims at female start-up leaders. The accelerator “UStart” targets DCU students with a start-up idea. In addition, the Academy is the education partner for the MasterCard Company in the Specific Start Path Accelerator. EE in the accelerator programmes comprises business development education, basic business knowledge, personal skills development, training, mentoring and networking opportunities to the companies as well as investment capital and incubation space in some of the programmes.

Exhibit 3-1: Overview about curricular EE offers at the DCU Ryan Academy

No.	Name	Contents	Target group	Offered since [year]	No. of participants in [year]
(1)	Master degree programmes				

⁴⁸ See <http://www.nfq.ie/nfq/en/index.html>.

⁴⁹ The Academy also offers further professional training programmes in general business education such as the Credit Union Development Programme and a Social Enterprise Governance Programme with a total of 77 in participants 2014 (not listed among the EE offers).

⁵⁰ See <http://www.qqi.ie/Pages/National-Framework-of-Qualifications-%28NFQ%29.aspx>, also for an overview about different levels of academic qualifications in Ireland.

1	MSc in Management (Innovation in Social Enterprise)	Social Entrepreneurship, Social Enterprise Development, Applied Portfolio, HR, Innovation and Creativity, Marketing, Next Generation Mgmt., Dissertation/ Internship, Business Strategy	Social Enterprise sector in Ireland and Wales: Non-business graduates, future leaders in social enterprise, social entrepreneurs	2012	44 (2014)
2	Graduate Certificate in Management – Digital marketing, Marketing for International Growth or Sustainable Energy Finance	Digital Marketing, Global Marketing, Sustainability and finance modules, Innovation and Entrepreneurship (only in Marketing for International growth) Career development workshops Research and consulting project	Unemployed professionals of marketing and financial services (Managers, supervisors and technicians)	2013 (until 2014)	158 (2014)
(2) Professional training programmes					
5	Farm Entrepreneurship and Leadership Programme	Modules on entrepreneurship and leadership, business, business development incl. farm specific content	Farm owners, managers or decision makers, future leaders	2012	40 (2013), 20 (2014)
6	SFI Entrepreneurship Programme for Researchers	Basic business knowledge for start-ups e.g. new product and service development, IP, funding, etc., personal skill training	Scientific researchers seeking to commercialise their research	2012	65 (2013), 88 (2014)
7	Tech Venture Programme at Invent DCU	Basic business knowledge for start-ups e.g. new product and service development, IP, funding, etc., personal skill training	DCU researchers seeking to commercialise their research	2010	15 (2012)
(3) Accelerator programmes					
8	Propeller Venture Accelerator	Workshops and lectures on entrepreneurship and business; mentoring; personal skill training	Entrepreneurs in start-up companies with high growth potential	2011	6 companies in year 1, 24 in total, 10 participants in 2014
9	Female Propeller Programme	Business development; mentoring; personal skill training (incl. women specific content)	Female entrepreneurs leading start-ups with growth and export potential	2014	12 companies, 15 participants in 2014
10	UStart Student Accelerator	Business development mentoring; personal skill training (e.g. self-belief and pitching preparation)	DCU student entrepreneurs with a start-up idea	2013	7 companies, 20 participants in 2014
11	MasterCard Start Path Accelerator	Comparable to Propeller Venture Accelerator	Start-ups in payment industry	2014	8 companies, 12 participants in 2014

At **honours bachelor degree level** (level 8 in the NFQ), DCURA offered a Business Innovation Programme until 2014 for unemployed professionals. The Business Innovation Programme consisted of two streams: Stream 1 "Innovation management" and Stream 2 "Practical marketing". See Exhibit 4-2.

As regards accreditation, the Master degree and Honours Bachelor degree programmes (Level 8 and 9 in the NFQ) are accredited by the DCU Business School. The level 6 programmes are accredited by the Quality and Qualifications Ireland (QQI) Agency. Before, the accreditation was conducted by the FETAC, the Further Education and Training Awards Council, being replaced by QQI in November 2012.⁵¹ The accelerator programmes are not accredited and they do not offer a certificate for participants. However, Enterprise Ireland approved the Female Propeller programme.

Exhibit 3-2: Overview about former bachelor degree EE offers at the DCU Ryan Academy

(1b) Honours Bachelor degree programmes (until 2014)					
3	Business Innovation Programme – Stream 1: Innovation management	Managing the Innovation Organisation, New Product & Service Development, Project Mgmt., Practical Research Project, Personal skill training	Unemployed professionals and managers with significant work experience	2010 until 2014	91 (2012/13), 50 (2013/14)
4	Business Innovation Programme – Stream 2: Practical marketing	Creativity & Innovation, Skills for Success, Communication Skills Introduction to Marketing, Practical Research Project	Unemployed professionals (Managers, supervisors and technicians)	2012 until 2014	39 (2013), 42 (2013/14)

Importance of specific offers

All of DCURA’s EE offers have their specific value – for participants and also for DCURA.

Former CEO Ann Horan highlighted the accelerator programmes and the SFI Entrepreneurship Programme for Researchers as “the heart of what we do” because they impart entrepreneurial thinking and start-up knowledge for already existing ventures and venture ideas. The accelerator programmes are the Academy’s most important offers because, firstly, through these programmes it has been possible “to really get to know start-ups and to understand their needs”. This can be seen as the basis for developing the core EE modules, which can be also transferred to other target groups (see chapter 1.2.3, on methods and media). Secondly, the programmes have an effect on the economy because start-ups create jobs and the programme helps the start-ups to grow and proceed. Thirdly, the accelerators help the Academy to grow its network, including its pool of mentors and investors, including angel investors. These positive effects facilitated the extension of the accelerator programmes to specific target groups such as women, students, and the MasterCard Company.

The specific value of the SFI Entrepreneurship Programme for Researchers and also of the Tech Venture Programme is the possibility to network with researchers who seek to commercialise their findings. Entrepreneurial thinking and start-up knowledge is especially important for this target group.

Finally, the Master in Social Enterprise is of significant importance because the social sector has a special need for entrepreneurship education.

Rationale for the composition of DCURA’s EE offers

The composition of DCURA’s EE programmes stems from several influences: the strategic intention of DCURA to foster entrepreneurship in Ireland, specific agendas and ideas from the different stakeholders, and the necessity to operate the Academy in a financially sustainable manner. According to the CEO, after the reopening of the Academy, the programmes were offered in a rather “opportunistic” way. Education and training were offered where companies’ needs and training needs could be identified and revenues could be achieved. Today, the availability of funding is still the most important factor for offering a specific programme. The launch of the accelerator programmes and of some of the other EE programmes such as the social enterprise programme can be attributed to the influence of Declan Ryan. The DCU influence on programme decisions increased after the appointment of the new President, leading

⁵¹ See: <http://www.education.ie/en/The-Department/Agencies/Quality-and-Qualifications-Ireland-QQI-.html>.

to the rising “inside orientation” of the Academy towards DCU and its target groups. Towards this end, DCURA initiated the student accelerator programme UStart and the Invent Tech Venture programme to help researchers to commercialise their findings.

4.2.2. Target groups

The EE offers have different target groups.⁵² Generally, DCURA targets leaders and employees from start-ups, Irish SMEs and larger corporate firms as well as researchers, students and unemployed professionals. The participants stem from different sectors, for example from the social enterprise sector or from agriculture. In 2014, DCURA had 536 students in the different programmes (see Exhibit 4-1). UStart is the only DCURA offer in which DCU students take part.

4.2.3. Designing lectures and courses – basic curricular decisions

Objectives of entrepreneurship teaching at DCURA

As formulated in DCURA’s vision and mission statement, the overall objective of entrepreneurship teaching at DCURA is to “promote an entrepreneurial mindset and real innovation focus” among its participants, in their companies and in Irish society.

The following descriptions illustrate in detail the initiation, target groups, funding, design and contents of the different DCURA programmes, also with regard to the influence of the Ryan Family. Each programme is designed by the DCURA team together with external experts or funding bodies or both.

Methods and media

The lectures at DCURA are **very practice-oriented**. Most of the programmes contain core EE modules. CEO Eoghan Stack describes them as a “derivative of what we typically do”. They will constitute a condensed EE programme for Austrian start-ups in October/November 2015.

Communication skills: The programme participants learn to clearly communicate their idea and their offer in a few words. Their “story telling” capability shall be improved. Furthermore, at the end of the programme the participants have to tell their story in form of a pitching competition in front of investors.

Business model canvas: The business model canvas is a strategic management tool for developing, adapting and describing business models which are subdivided into nine building blocks.⁵³ With a focus on a lean approach (the “lean canvas”), participants shall learn how to build a business model with few resources available.

Product-market fit: Using the value proposition canvas tool in extension to the business model canvas, it shall be ensured that the offer fits with the market. In the “value proposition canvas”, on the one hand customer jobs and related gains and pains are described for a certain customer segment. On the other hand, it illustrates the products and services and their functioning as “gain creators” or “pain relievers” for customers’ jobs.⁵⁴

Customer acquisition analysis: In this part, which is related to the business model and value proposition canvas, participants go into detail to understand the customer, how to acquire customers and how to continue business with the customers.

Financial modelling: The participants learn the financial modelling of revenues and costs in the developed business model and how to control and manage their finances.

Understanding investors: The target of this module is that the participants learn what is important to potential investors with regard to the company’s set up, team and product.

Enterprise sales: Participants learn the specificities of business to business (B2B) sales.

⁵² See also Hisrich & O’Cinneide (1996), p. 55f for different university programmes with specific target groups.

⁵³ The building blocks comprise: Customer segments, value propositions, customer relationships, channels, revenue streams, key activities, key resources, key partners and cost structure. See: <http://www.businessmodelgeneration.com/>; <https://strategyzer.com/>.

⁵⁴ See: http://www.businessmodelgeneration.com/downloads/value_proposition_canvas.pdf.

Guest speaker event: Guest speakers from business are invited to bring in practical competence from the industries in focus of the programmes. The participants can also establish network contacts to the guest speakers and the audience.

In the female accelerator programme and in the former programmes for unemployed, personal skill development has been included. Female entrepreneurs and unemployed people were sometimes found to not have the same confidence as males and employees, respectively.

The content of the described modules is part of most EE programmes at DCURA, although named differently. Length and intensity vary by programme.

Objectives, contents and methods of specific curricular offers

Master Degree Programmes

Master in Social Enterprise

Since 2012, DCURA offers a master programme in management named "MSc in Management - Innovation in Social Enterprise". It is accredited by DCU (Level 9 in the Irish National Framework of Qualifications NFQ⁵⁵). It is a **two-year part time study** programme for students from Wales and Ireland, in which the content is mainly delivered through virtual (blended) learning. One full week per semester, the students attend lectures at DCURA in Dublin.

The content has three parts: Knowledge about social enterprises, general management and entrepreneurship courses as well as a practical research project. The programme was mainly funded by the European Regional Development Fund through the Ireland Wales Programme 2007 – 2013 (InterReg 4A). Programme partners include Bangor University (Wales), North Dublin Coalition Limited (NorDubCo), and Business in the Community Wales (BICW). Further social and corporate stakeholders from both regions support it.

Target groups up to now have been people with a general interest in the topic of social enterprise, applicants from charity organisations who need to acquire knowledge, for example about funding, and entrepreneurs trying to build social businesses. Until now, the programme has been free of charge for the participants. As funding ran out at the end of 2014, the course is since then offered for a fee of around 5,000 euro. The market response to the first programme, which the co-ordinators saw as a pilot, was very high. The programme had 370 applicants, out of which 44 could take part in the programme. The interviewed programme managers in DCURA were optimistic that the new programme will be a success despite the fees.

The speciality about the programme has been the **cross-border knowledge exchange in a blended learning environment**: delivering the content in webinars, using virtual classrooms based on Moodle⁵⁶, and working with Skype conferences in projects. According to the interviewees, the knowledge exchange among the students worked very well. With these online tools, groups of Welsh and Irish participants could be formed on group assignments, working on either Welsh or Irish projects, which increased cross-border learning. Cross-border learning was especially successful during the attendance week at the Academy.

The programme was designed under the leadership of Deiric O'Broin, an expert in the field of social enterprise, together with the programme partners and the DCURA programme coordinators. Course content was also discussed in the Menter Iontach Nua Steering Group, which consists of around 20 social enterprise experts.⁵⁷ In addition, the Academy carried out training needs analyses. Thus, according to the DCURA programme coordinators, "the programme is very much reflective of what the sector needs".

In addition to the two-year Master programme, the academy offers the free of charge Level 6 FETAC programme "Social Enterprise Governance" with limited EE content.⁵⁸

⁵⁵ See: <http://www.nfq.ie/nfq/en/index.html>. Level 9 in the NFQ comprises programmes with master degree and post graduate diploma.

⁵⁶ Moodle is an open-source based e-learning platform to create customised learning environments, e.g. virtual classrooms with downloadable learning materials and discussion forums. See: <https://moodle.org/>; <http://en.wikipedia.org/wiki/Moodle>. In August 2013, it had over 51.000 registered sites with more than 6.6 million courses and approx. 60 million users (<http://moodle.net/stats/>, 26/8/2014).

⁵⁷ See: <http://www.ryanacademy.ie/social-enterprise/menter-iontach-nua-steering-group>.

⁵⁸ See <http://www.ryanacademy.ie/social-enterprise/social-enterprise-programme>.

Graduate Certificates in Management (Digital Marketing, Marketing for International Growth or Sustainable Energy Finance)

For one year, in 2013/2014, DCURA together with DCU offered “Graduate Certificates in Management” (40 ECTS) in the fields of digital marketing, marketing for international growth and in sustainable energy finance. The programmes were accredited according to level 9 of the Irish NFQ, equivalent to the post-graduate Master degree level. The offer targeted unemployed professionals: managers, supervisors or technicians who were interested in gaining additional skills. The content comprised specific modules on digital marketing, global marketing and sustainable energy finance as well as career development workshops and a research and consulting project in host companies. Only the programme “Marketing for International Growth” contained a separate module on innovation and entrepreneurship. The programmes were established as an extension of the Business Innovation Programme. After the four-year funding ended in 2014, the Academy received continued funding only for the level 9 programme in sustainable energy finance.

Honours Bachelor Degree Level Programme

Business Innovation Programme

The DCURA programme in “Innovation management” was part of the Springboard initiative⁵⁹ which was funded by the Irish Higher Education Authority (HEA) for four years. It aimed to upskill highly qualified unemployed professionals especially in innovation management for potential future work as entrepreneurs or intrapreneurs in existing companies. The programme obtained a NFQ level 8 accreditation (honours bachelor degree). It was free of charge and it was set up for one year. The programme consisted of four main parts: New product and service development, project management, a practical project and additional personal skills. In the product and service development part, the business model canvas played a crucial role. In the practical project, the participants had to do a practical innovation project work for companies in teams. Moreover, personal development played a crucial role looking at the strengths of the people in order to sharpen their personal goals.⁶⁰

After two years of operation, the programme was split in two streams. The second stream beside “Innovation Management” was called “Practical marketing”. It comprised courses in creativity and innovation, marketing in the digital era, and practical (generic) marketing. It also contained improvement in personal skills and a personal development part, as well as a practical research project as an individual assignment in host companies. In 2014, the four-year funding and the programme ended. According to Ann Horan, the programmes for unemployed professionals are of decreasing importance, as the economy is actually in a better state than four years ago and professionals are able to find new jobs easily without the help of a programme.

Professional training programmes

Farm Entrepreneurship & Leadership Programme

The Farm Entrepreneurship & Leadership Programme was created after a meeting with an Irish co-operative in the agricultural sector, ICOS. The meeting participants identified a need for a short programme developing farmers’ leadership and business skills. Additionally, the responsible programme manager remarked that the “aim is to make them think outside the box, that you don’t just need to do dairy farming or sheep farming, you can actually do other things. Your best asset is your land.” The programme is set up to last seven days, spread over 13 weeks because the farmers do not want to leave their land for a long time. The programme has a Level 6 accreditation from the Further Education and Training Awards Council (FETAC). Being developed with the industry, the course content includes introductions to finance, marketing, funding, project management, leadership, communication, and risk management. It culminates in a presentation by each participant on a business model canvas based on their agri-business. Some classes are particularly important for the sector, for example risk management due to spot checks by authorities.

⁵⁹ See: <http://www.springboardcourses.ie/>.

⁶⁰ It was mentioned that from a psychological point of view, rebuilding the confidence of the participants was very important, as to some of them losing their job as a highly qualified person, it seemed almost “as losing part of their identity”.

SFI Entrepreneurship Programme for Researchers

The SFI Entrepreneurship Programme for Researchers targets researchers from all Irish universities who want to commercialise their research findings. It is funded by the Science Foundation Ireland (SFI) and runs for nine days over four months. Basic business and business development knowledge for start-ups is taught, comprising subjects such as new product and service development, technology assessment, intellectual property, funding, legal issues, and business planning. The programme also includes communication skills training and mindset development since the researchers “don’t know how to explain [their business]” and “they don’t have entrepreneurial thinking”, as mentioned by one interviewee. The programme ends with a day on which the participants pitch in front of investors. The number of participants has grown from twelve in 2012 to 108 in 2014. The programme builds on experiences from the Tech Venture Programme.

Tech Venture Programme at Invent DCU

The Tech Venture Programme at DCU Invent also helps researchers to commercialise their research. It targets DCU researchers and was initiated in 2010 following the inauguration of DCU’s new President Prof. Brian MacCraith and the Academy’s increasing strategic orientation towards DCU. It comprises similar contents and a comparable structure as the SFI programme. Teachers from business deliver the contents, which DCU Invent’s website markets as an advantage to potential participants.⁶¹

Accelerator programmes

Propeller Venture Accelerator

The Propeller Venture Accelerator was initiated by the Ryan Family and established in 2010. The initial funding of 1 million euro came from Irelandia Investments whose shareholders are Ryanair and Tigerair. The aim is to accelerate early stage technology start-up companies through 30,000 euro upfront cash funding, incubation space, business training workshops, a mentoring programme, and a demo day at which the companies can present their business to raise more funding. In exchange, DCURA in the first three propeller programmes obtained an equity share in the companies of 6.5%. Meanwhile the model has developed further as external business angels are funding the programme, including the coordination by DCURA, obtaining shares of 7.5% from the propeller companies. The business training workshops are organised by the Academy and conducted by mentors with content including entrepreneurship, business, accounting, finance, human resources, and funding. Particularly recognisable is the intense mentoring programme with more than 40 mentors who have business, technology and entrepreneurial backgrounds, providing four to six mentors per company.⁶² According to an interviewee, the mentors help with their experience in order to prevent start-ups from doing the same mistakes others did. The Propeller programme was graded as the 7th best accelerator in Europe by a Kauffman Fellows Programme study.⁶³

Female Propeller Programme

The female propeller programme was initiated for various reasons and circumstances. First, the academy staff realised that there had been few females on the first Venture Propeller programmes. Second, staff found out that in Ireland it is twice more likely for men to set up a business than for women, and that men were nine times more likely to scale their business. Third, they addressed the topic to potential sponsors who showed an interest in supporting the female propeller programme. Fourth, the team spoke to a venture capitalist who works closely with Declan Ryan and who was involved in the Venture Propeller Programme. He advised the team to target a niche with a female propeller programme, since the existing Propeller Programme was a “kind of me-too” programme.

Part of the funding for the female propeller programme comes from Enterprise Ireland.⁶⁴ As a precondition to apply, the start-up has to be in operation for at least one year and a maximum of five years, and the female founder has to own at least 51% of the company. Individuals and teams can apply. In addition, the business model has to be scalable and it has to have export

⁶¹ See <http://www.dcu.ie/invent/training-opportunities.shtml>.

⁶² See full list at <http://www.ryanacademy.ie/propeller-venture-accelerator/mentors>.

⁶³ See Gilani & Dettori (2011), p11.

⁶⁴ <http://www.enterprise-ireland.com/en/>, 27.7.2014.

potential. In the first run starting 2014, 135 companies applied for ten places and the Academy selected twelve. They came from diverse industries, like food, technology and baby products. The programme ran once a week for 13 weeks in the building of the Academy, with lectures on business development in the morning and personal skills in the afternoon. The business development training was mainly based on the business model canvas and the “lean start-up”. The personal skill training covered, for example presentation skills, training on how to do radio or TV interviews, tax and legal issues, and women-specific information.⁶⁵ For example, one course informs women on how to dress best. This may sound amusing, but an interviewed participant mentioned this course as very useful.

In addition, the programme manager stated that the training on how to pitch and on how to ask investors was very important, as women tend to ask for less money than they need and “do not have the confidence to ask the investor for the right things”. At the end, they had to do a competitive pitch in front of the jury for different prizes such as a 5,000 euro award for a trip to Silicon Valley. During the programme, experienced practitioners mentored the women. It was mentioned that Declan Ryan was very much involved in the programme, also helping participants to receive further funding through the help of his connections.

UStart

UStart is a 16-week accelerator funded by JP Morgan Chase Foundation that helps students to develop their business ideas into start-up companies. It is targeted at both profit and non-profit ventures from all DCU students, including undergraduate, graduate, postdoctoral and part-time students. Students obtain 5,000 euro in seed funding, training and workshops from start-up company experts, access to the mentoring network, and incubation space, as well as the opportunity to pitch on a demo day. The training covers the lean business model canvas, presentation training, financials, start-up law, product development, market research, sales, digital marketing, accounting and understanding tax for start-ups as well as self-belief and pitching preparation sessions. The students are located in the same building as the more mature start-ups from the Propeller programme, which is meant to create a very good learning atmosphere. In the pilot year it was organised by DCU academics provoking “a little bit of a clash of styles” according to one DCURA interviewee. In 2014, the Academy’s staff ran UStart after having received improvement feedback on the programme’s organisation.⁶⁶

MasterCard Start Path

DCURA serves as the education partner for MasterCard’s Start Path accelerator, which targets start-ups in the payment industry related to MasterCard. Teaching contents is based on the DCURA Propeller venture accelerator.

4.2.4. Setting of entrepreneurship teaching

Most of the lectures and training sessions are conducted in the Academy’s building in the Citywest Campus, approximately 20 km outside Dublin (see photos of the building in the Annex). The interviewees see the location “a little bit isolated”, especially from DCU. However, some also saw it as an advantage because the isolation would foster the autonomy of DCURA, especially in the beginning.

The courses for the Graduate Certificates in Management take place at DCU. The incubation space for the Venture Propeller and UStart programme is located in the Liffey Trust Centre in Dublin, in which also part of the lectures are held.

4.2.5. Instructors: teachers and mentors

Entrepreneurs and business people as teachers

DCURA mainly works with external experts and trainers from the business world in order to assure high practicability of the content delivered. They comprise trainers from consultancies, for example, for the lectures and workshops on the business model canvas, as well as sector-

⁶⁵ See full schedule in the Annex.

⁶⁶ See Metcalfe (2014) for an interim evaluation of the pilot phase of UStart.

specific experts, for example, in the field of social enterprise. In 2014, DCURA contracted 27 external trainers to deliver workshops and academic modules across all programmes.

Academic teachers

Several of the core modules of the Masters and Graduate Certificate programmes are delivered by DCU lecturers. In 2014, DCURA worked with 13 DCU staff members delivering academic modules across several programmes. These lecturers are approved by DCU alongside the programme chair who is responsible for oversight of the academic content of the programme. In general, all programme chairs hold a PhD.

Mentors

External mentors from practice are particularly important for participants in the accelerator programmes. The business mentors bring in experience as well as business and technical skills “adding direct value to the [participants’] business development” (Eoghan Stack). DCURA has built a network of more than 150 active mentors including entrepreneurs, CEOs, investors, technology experts and consultants.⁶⁷ Many mentors come from the network of the Ryan Family. Others stem from the company network that DCURA has build up in the past years. In 2014, DCURA used mentors across four programmes in 2014 (see table below). Some mentors worked on several programmes.

Exhibit 3-3: DCURA mentors by programme

Programme	Background	Number of mentors in 2014
Business Innovation Programme	Mentors had strong business and support agency experience (Enterprise Ireland)	4
Propeller Venture Accelerator	Successful business entrepreneurs with expertise in areas such as finance, investment, sales & marketing	50
UStart	Successful business entrepreneurs with expertise also in areas such as digital marketing and legal issues	40
Female Propeller Programme	Industry experts and successful female entrepreneurs with expertise in specific areas such as finance, pitching, tendering	15

Managing external experts and trainers

All non-DCU accredited programmes, i.e. FETAC programmes, are subject to verification and oversight by the Quality and Qualifications Ireland Agency (QQI). As an approved provider of QQI programmes, DCURA is externally evaluated on the quality of training provision including participant feedback, trainers’ backgrounds as well as experience and material delivered. All these programmes are devised in co-operation with sectoral stakeholder groups.

The accelerator programmes do not lead to an academic award. However, according to DCURA they are subject to rigorous and continuous assessment both internally in DCURA and from external stakeholders. Trainers and mentors for these programmes are selected for their expertise and training experience.

The SFI programme is similarly reviewed and assessed in addition to further reporting to the commissioning organisation. Renewing trainers’ contracts on an annual basis may be considered as a verification of their quality.

Evaluation of courses and programmes

The programmes and their contents are modified regularly after each programme period according to market needs, including funding availability, as well as through experiences of

⁶⁷ See for example the list of mentors in the propeller venture accelerator at <http://www.ryanacademy.ie/propeller-venture-accelerator/mentors>.

programme pilots including the analysis of participant feedback forms. Programme evaluations take place both internally with staff and trainers as well as through participant feedback. Changes are made where deemed necessary.

4.3. Extra-curricular activities in entrepreneurship education

Overview about most important extra-curricular activities

Extra-curricular entrepreneurial education activities at DCURA comprise speaker series, panel discussions, presentations, networking events and conferences often related to the programmes mentioned above and with different target groups. For example, there are speaker series offered in the field of social enterprise covering topics such as leadership, procurement and creative networking. In the event "Farm Diversification Case Studies & Panel Discussion" on the 10th of June 2014, three cases were presented by different speakers on how farmers could diversify and make additional business.

DCURA plans to increasingly organise events for DCU students. This includes a so-called "Hackathon weekend"⁶⁸ in April 2015. During the weekend around 120 – 150 DCU students grouped up in diverse teams and developed business ideas within 48 hours. They had to create an offer (product, service or both), prototype it and test it "as much as they can in 48 hours".

In March 2015, DCU students could participate in a talk on start-ups and failure. Three start-ups that started their business and were unsuccessful presented "their story".

Objectives, contents, methods and settings

DCURA uses the extra-curricular events for networking and promotional purposes for EE and to augment the EE programme offers. The events build relationships, specifically with mentors; they initiate training programmes; and they help to attract participants for the Academy's programmes. By taking part at an event and being in the facility, the companies learn about the Academy's activities and vice versa. For example, the Credit Union Programme and also a part of the Farm programme were initiated in this way.

The events and presentations closely related to the programmes – as the speaker series in the field of social enterprise mentioned above – bring in practical expertise to the programme participants. They are used for promotional and networking purposes as well, as they are often open to a wider audience than only to the programme participants. For example, for the female propeller programme Debra Searle, a professional adventurer, solo Atlantic rower, author and motivational speaker, was invited to Ireland. All people in the DCURA's database were invited to the event giving the women in the programme an additional networking opportunity. All events are offered regularly. In some cases, the events are even created in an opportunistic way, when a "world class individual" comes to Dublin.

Extra-curricular activities management

As regards organisation of extra-curricular activities, DCURA's management team sets up an annual plan for the events. It targets offering an event almost every month, cumulating into nine to ten events a year. The events are mainly organised by the Academy's Chief Operations Officer. The Ryan Family helps in promoting the events and the DCURA, as Declan Ryan often distributes event invitations to people in his network.

⁶⁸ The word "Hackathon" originally stems from software development.

Exhibit 3-4: Overview about extra-curricular EE offers at the DCU Ryan Academy

No.	Name	Contents	Target group	Offered since	Participants
1	Leading for Innovation	Leading innovation expert – Paul Sloane outlines his 6 Thinking Hats and other Innovation Theories	Aspiring Entrepreneurs, Potential applicants to BIP Programme	One off event	62
2	Cartier Women's Initiative	Leading female entrepreneurs outline their story	Female high flyers and other female affiliates to Academy	One off event	53
3	Business Start Up Driver	Workshop on how to start a business	All aspiring entrepreneurs	One off event	49
4	How to Access Social Enterpr. Funding	Social Enterprise funding	Social Enterprise sector	One of a series of workshops for SE, 2011	96
5	Leadership in Social Enterprise	Leadership skills in Social Enterprise	Leaders in Social Enterprise	One of a series of workshops for SE, 2011	67
6	Free Event with Dragons Den Expert	How to get an idea to form a business	Aspiring entrepreneurs	UStart promotion event	100
7	Mark Little - Storyful	An Irish entrepreneurs success story	Aspiring entrepreneurs	One off event	28
8	Social Enterprise Speaker Series	Series of events to assist Social Entrepreneurs in networking, finance, etc.	Social Enterprise sector	Series of workshops for SE, 2011	400
9	Growth through Innovation	Showcase of assignments by Business Innovation Programme students in host companies and panel discussion on innovation in Ireland	Participants, host companies, funders, Dept. of Social Protection	Annual end of programme event	83
10	Research Showcase	Showcase of projects of MSC in Innovation in Social Enterprise students	Social Enterprise sector	Annual end of programme event	73
11	Debra Searle	Female entrepreneur and Atlantic Rower	Female entrepreneurs	One-off event in Female Propeller programme	54
12	UStart & Venture Propeller Showcase	End of programme pitch for funding	Funders, angel investors, mentors, participants	End of programme pitching event	298
13	Kelsey Ramsden	Canadian entrepreneur	Female entrepreneurs	One off event in Female Propeller programme	34
14	Farm Diversification Case Studies & Panel Discussion	Cases on how farmers could diversify and make additional business	Farmers, entrepreneurs in agriculture	One off event	Approx. 50

Source: DCURA

4.4. Institutional aspects of entrepreneurship education

Organisational set-up: benefits of a university-enterprise partnership

As regards the DCURA model as a partnership between the Ryan Family and DCU, several interviewees said that the DCURA **combines the strengths of both partners** (“best of both worlds”). The practical and action-focused orientation in the Academy, as well as the intense support in funding and networking can be attributed to the Ryan Family. The DCURA network of host companies, funding bodies, investors, lecturers, trainers and mentors can be regarded as a key strength. On the other hand, DCU and its business school DCUBS provide the accreditation for higher-level entrepreneurship education and the access to academics.

The **brand name** “DCU Ryan Academy” was stated in the interviews to be an additional strength, beneficial not only to the Academy but also to DCU. For the Academy, bearing the Ryan name constitutes an advantage in communication and in the acquisition of students, since the Ryan Family with its company Ryanair are seen as an example of internationally successful entrepreneurs from Ireland. It was mentioned that the DCU part of the brand name is beneficial as well. Students and employers appreciate a well-known, competent and academic body for accreditation like DCU, compared to less-profiled academic organisations offering EE and training. For DCU itself the DCURA brand also provides benefit. The President uses it to communicate DCU’s strategy and the concept of the “University of Enterprise” including entrepreneurship.⁶⁹

Laws, statutes and codes: flexibility of a “hybrid” model

Another key strength was said to be the flexibility of the “hybrid model” of the Academy being a separate, autonomous entity from the University but with close connection to it. The model avoids rigid organisational structures and the sometimes long decisions and accreditation procedures of a public university. Concerning employment procedures, for example, the Academy can employ staff for a programme in a flexible way, while there would be legal or budget restrictions at the University. Furthermore, reacting in a flexible way to market and customer needs in the design of the programme would, in some cases, not be possible given the formal approval and decision structure of the University. The procedures and the slow movement of DCU as a governmental organisation were mentioned as a weakness of the model. However, this was asserted to have changed with the new President.

Entrepreneurial mindsets: advantages and disadvantages of a tight budget

The limited amount of funding and the tight budget can be seen as both an advantage and a weakness. The limited budget at the beginning of the Academy’s operations provoked opportunistic but also entrepreneurial behaviour. Management had to look for offers with immediate revenues to keep the operations running after the initial failure of the Academy. For this reason, EE was not strongly promoted following the resumption of the Academy. Yet, the development of an entrepreneurial culture and the market and customer orientation were developed essentially due to this budget pressure. Interviewees considered it as a key strength for having an entrepreneurial spirit in the organisation itself when delivering and promoting entrepreneurship education. On the other hand, it was mentioned that the financial sustainability of such a model is difficult to achieve due to a strong dependency on fixed-term funding.

4.5. Outreach to external stakeholders of entrepreneurship education

DCURA has a **large number of external relationships** related to entrepreneurship education. The DCURA network can be considered as one of the key success factors of the model. The programme participants and especially start-up companies benefit from these connections. The external relationships comprise external lecturers and external experts in certain areas for new ideas and advisory purposes. Particularly important are external mentors from practice for the course participants mostly in the accelerator programmes. DCURA has built a network of more than 150 active mentors. Companies also form part of the DCURA network as customers for EE

⁶⁹ “In the next five years we will: Build on the reputation of the DCU Ryan Academy, for Entrepreneurship as the leading supporter of entrepreneurship and innovation in Ireland.” DCU (2012), p. 23.

and training, for funding and sponsorship (especially investors) and for attending networking events and presentations. More than 200 host companies are in the DCURA database for hosting practical research projects in the EE programmes.

The **Ryan Family** and their related institutions with their network play a key role in establishing connections to the external partners. In particular, they provide contacts to mentors and companies including investors who help the Academy to develop further, to receive new ideas, to find a financial basis for a programme, and generally to promote entrepreneurship. In exceptional cases, the Ryan Family helps certain participants or start-ups with networking and advice, as for example in the female propeller programme.

In addition, DCURA has what the management calls “**internal strategic partnerships**” to DCU-related institutions to which the Academy provides expertise. These include for example DCU Invent, the National Institute for Digital Learning (NIDL) at DCU⁷⁰, DCU Innovation Campus, and DCU Centre for Family Business. For example, the DCURA team offers the Tech Venture programme to DCU Invent’s participants (see section 1.2.3). NIDL uses the Academy’s blended learning experience of the social enterprise programme as a best practice example.

“**External strategic partnerships**” comprise relationships to other universities like Limerick Institute of Technology and Arizona State University with the target of running EE programmes together. For instance, Limerick Institute of Technology approached DCURA recently to run a propeller programme for them.

DCURA and Declan Ryan are also deeply involved in recruiting and enabling the first **Dublin Startup Commissioner**⁷¹ in partnership with the Department of Finance, Enterprise Ireland, the Dublin City Council and the Dublin Chamber of Commerce. The task of the Commission is to promote Dublin as a leading city and innovation hub for start-up companies, to coordinate the activities of different corporate and governmental players in the entrepreneurship ecosystem and to be involved in policy development in order to foster entrepreneurship and job creation in Ireland. Additionally, DCURA is involved directly in **policy development for start-ups** supporting job creation. DCURA is part of a delegation which presents to a subcommittee of the Parliament and works on a policy paper with the target of enabling entrepreneurship in Ireland. An interviewee mentioned that the recruitment of the Commissioner and the policy development activities show that DCURA also takes a leadership role in fostering entrepreneurship in a wider sense.

4.6. Impact and lessons learned

4.6.1. Measuring impacts of the entrepreneurship education approach

The success of the accelerator programme and the business innovation programme can be measured as follows: In the accelerator programmes of 2010 to 2013, DCURA accelerated 54 start-up companies, facilitated the creation 108 new jobs in start-ups, and helped raising 5.1 million euro of start-up follow-on funding. The springboard programmes including the DCURA Business Innovation Programme (2010 – 2013) trained 744 unemployed professionals and brought 65% back into work after twelve months.

While DCURA keeps in contact with all graduates, there is currently no formal tracking of companies started by graduates.

4.6.2. Lessons learned

Summary of lessons learned from this case

The DCURA case offers several lessons from which other universities may learn. These include the DCURA partnership organisation, the diversity of offers for different target groups, the teaching approach of core EE modules mainly based on the business model canvas, and the social enterprise programme.

⁷⁰ See <http://dcu.ie/nidl/index.shtml>.

⁷¹ See <http://startupdublin.com/>.

The advantages of the **DCURA partnership** organisation lie in the autonomy, the flexibility, and the entrepreneurial spirit of the academy organisation itself, which combines the strengths of both partners. The Ryan Family has had a strong practical and action-oriented influence and has supported DCURA especially in funding and with its network. DCU performs the academic part accrediting the bachelor and master level programmes and delivering modules on these programmes with its lecturers. DCU also provides central functions such as accounting, marketing, information technology, human resources and facility management for the academy as in-kind funding.

Setting up **different programmes for different target groups** such as start-ups and social enterprises with a core EE offer and specific adaptations to each sector and target group can be considered an interesting EE programme approach. The Academy targets specific needs of specific economic sectors (e.g. farmers, researchers) and groups with specific social requirements (e.g. females, social enterprises, unemployed). However, to the outside, this may foster the impression that the Academy is unfocused.

DCURA's **core EE modules** comprise communication skills, the business model canvas, the product-market fit, customer acquisition analysis, financial modelling, understanding investors, enterprise (B2B) sales and guest speaker events. The modules are included in most of the programme on entrepreneurial education in DCURA. The length and intensity varies depending on the programme. Target group specific adaptations are made in terms of lectures (e.g. risk management and cases for farmers), skill trainings (e.g. women specific content), settings (e.g. blended learning versus on-site lectures) and intensity (short versus long programmes).

The **business model canvas** as a start-up and strategic management tool plays a crucial role as it serves as the basis for business development and also as a framework for a part of the following modules (e.g. product-market fit, customer acquisition analysis). Participants learn how to develop a business with few resources available and communicate it in a clear way.

The **social enterprise programme** based on blended learning techniques for social entrepreneurs and target groups from Wales and Ireland may be a good practice for cross-country knowledge exchange in EE. This is shown by the promotion of the programme by the National Institute for Digital Learning. Students from different countries learn how to study and work in groups in digitally.

Prerequisites for a university-business partnership to work

Examining the DCURA case, the prerequisites for a similar partnership model to work successfully may include the following:

- There needs to be a **shared vision** and commitment from the two partners for the development of entrepreneurship and EE. Without a shared vision, it is difficult for the head of such an Academy to meet expectations of both partners. Concerning the university there needs to be commitment from the top management so that co-operation with both partners working is possible. With regard to the private partner, a philanthropic vision of promoting entrepreneurship in the country and also with regard to special target groups such as females, the social or the farming sector appears to be useful. One interviewee mentioned that the Ryan Family has such a philanthropic vision with the goal of fostering entrepreneurship in Ireland "because it is good for Ireland". However, private sponsors especially in the investment sector can also have advantages in receiving access to start-ups when being involved in an EE programme. A way to make the model more attractive would be to have a better pay off for private partners (e.g. through obtaining shares in the start-ups) as in the new venture propeller programme. However, the university would need to pay attention to the influence on the programme decisions and course contents.
- There must be **intense communication** between the partners and the Academy to align goals, expectations and programmes. In terms of strategic decisions and funding, an institutionalised advisory board can be seen as useful. Communication between the partners is institutionalised through the board. Programmes involving several parties require intense communication between the parties.
- Led by a shared vision, an academy like the DCURA needs the **autonomy and flexibility** for programme and management including employment decisions. Rigid university structures and processes need to be avoided because the Academy needs to be able to react to market and customer needs with regard to programmes and contents.

- Several interviewees mentioned **commercial and relationship-oriented leadership** as a very important aspect. In case of a limited budget and the dependency on fixed-term funding, it is important to have a CEO with a commercial orientation and management skills. Essential factors are relationship building and negotiation skills, not only for networking purposes, but also in managing the expectations and “being able to compromise” with both partners working together. It was stated that someone with a “strong head” going his or her own way would probably not be a good choice for this position. Relationship building and negotiation competences are also important for programme managers because project work requires them to work together with different partners from practice, from funding bodies and from the organisation, each with different cultures and organisational restrictions.
- Limited **funding** has the advantage of fostering an entrepreneurial culture within the academy, especially at the beginning of the operations. However, after a certain time, the essential funding for basic staff seems necessary to ensure that the vision of promoting entrepreneurship and EE can be put into practice with enough resources. In an ideal partnership, both the practical partner from a private business and the university provide financial support and in-kind funding at a comparable value. Funding for EE programmes also needs to be available “on the market”.
- **Contributions of the best of both partners:** The practical partner should bring the practical experience, a big network, a strong brand, an entrepreneurial spirit and a strong orientation towards action. The university partner should contribute knowledge in EE, also a strong brand, accreditation and processes with regard to programme design and lecturing as well as lecturers for one part of the courses.

Transferability to other universities

In sum, the DCURA model may be transferrable to other universities and countries, provided that, firstly, a private partner engages in a comparable way as the Ryan Family does and, secondly, that the University shows strong commitment, allowing the hybrid organisation to work. The third key to success may be a qualified leader of the organisation.

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Annex

The Building of the DCU Ryan Academy



Programme Structure Female Propeller

Female Propeller for High Fliers - Programme Schedule 2014

Wk No:	Morning:	Module Title:	Afternoon:	Module Title:	Guest Speakers / Evening Events:
Wk 1: Feb 25th	9.00am - 12.30pm	Business Model Innovation & Customer Development	1.30pm - 5.00pm	The Way Women Work	Declan Ryan: 1.00pm
Wk 2: Mar 4th	9.00am - 12.30pm	Customer Discovery Framework	9.00am - 5.30pm x 3	One to One Coaching - Votive 3rd / 4th / 5th March	1.30pm 'Social Media Uses' 3.00pm 'Use of PayPal in Business'
Wk 3: Mar 11th	9.00am - 12.30pm	Value Proposition	1.00pm - 5.00pm	Leading Self - Votive	No Evening Event
Wk 4: Mar 25th	9.00am - 12.30pm	Technology for Start Ups (1)	1.30pm - 5.00pm	Working The Room "Successful Networking"	6pm Mentor Evening 'Open'
Wk 5: Apr 1st	9.00am - 12.30pm	Customer Segments	2.00pm - 6.00pm	Pitching to Win	Shay Garvey: 1.00pm Frontline VC
Wk 6: Apr 8th	9.00am - 12.30pm	Distribution Channels	1.00pm - 4.30pm	Making the Media work for YOU	Ann O'Dear: 4.30pm Silicon Republic
Wk 7: Apr 15th	9.00am - 12.30pm	Customer Relationships (Get / Keep / Grow)	1.00pm - 4.30pm	Meetings that make sense	6pm Dighwomen Event
Wk 8: Apr 29th	9.00am - 12.30pm	Revenue Streams	1.00pm - 3.00pm 3.15pm - 5.15pm	1 Taxation, PWC (T. Mc Colgan) 2 Dress 4 Success (K.Byrne)	No Evening Event
Wk 9: May 13th	9.00am - 12.30pm	Key Partners	1.00pm - 4.30pm	Brand Me	6.30pm 'Closed' Mentor Evening The Residence
Wk 10: May 20th	9.00am - 12.30pm	Resources, Activities & Costs	1.30pm - 5.00pm	Presenting & Public Speaking	6pm Mark Little
Wk 11: May 27th	9.00am - 12.30pm	Technology for Start Ups (2)	1.30pm - 5.00pm	The Road Ahead	No Evening Event
Wk 12: Jun 10th	9.00am - 12.00pm	Practice Pitching 'final run through'	1.00pm - 4.00pm	Pitching to Judging Panel	6pm Motivational Speaker - TBC
Wk 13: Jun 17th	Guest Speaker	10.30am - DEMO DAY		Winners Announced	Dinner @ 3pm VAL

Programme Structure SFI Programme



Get Started Technology Programme 2014



Group 1

Week:	Day:	Date:	Time:	Module:	Trainer
1	Thursday	19.06.14	9.00 am - 9.05 am	Introduction by CEO, DCU Ryan Academy	Ann Horan
	Thursday	19.06.14	9.15 am - 1.15 pm	Prepare to Pitch - "Tell Your Story"	Andrew Keogh
	Thursday	19.06.14	2.15 pm - 5.15 pm	Introduction to Technology Entrepreneurship	Frank Munnelly
	Friday	20.06.14	9.30 am - 12.30 pm	Market Feasibility & Exploratory Research	Geraldine Lavin
	Friday	20.06.14	1.30 pm - 4.30 pm	Project Management	David Staunton
2	Thursday	03.07.14	9.30 am - 12.30 pm	New Product Development & Innovation	Frank Munnelly
	Thursday	03.07.14	1.30 pm - 4.30 pm	Technology Assessment & Commercialisation Opportunity	Brian O'Kane
	Friday	04.07.14	9.30 am - 12.30 pm	Funding Models	Brian Caulfield
3	Thursday	24.07.14	9.30 am - 12.30 pm	Managing Legal Aspects of Start Ups	Peppe Santoro
	Thursday	24.07.14	1.30 pm - 4.30 pm	Intellectual Property, Trade Marks & Copyright	Cathal Lane
	Friday	25.07.14	9.30 am - 12.30 pm	Technology Sales	John Eager
4	Thursday	07.08.14	9.30 am - 12.30 pm	Business Finance and Cash Flow	John Crawley
	Thursday	07.08.14	1.30 pm - 4.30 pm	Marketing & Bringing it All Together in the Business Plan	Geraldine Lavin
	Friday	08.08.14	9.30 am - 12.30 pm	Prepare and practice 'Pitch' - Tell Your Story	Andrew Keogh
5	Friday	22.08.14	9.30 am - 12.30 pm	Pitching Event "From Lab to Product or Service"	Judging Panel

Programme Structure Tech Venture Creation Programme



Tech Venture Creation Programme Schedule 2014



Date	Time	Module	Tutor
October:			
Thursday 9 th	2.00pm – 5.00pm	Introduction to Technology Entrepreneurship	Frank Munnelly
Monday 13 th	2.00pm – 5.00pm	"Tell Your Story"	Andrew Keogh
Thursday 16 th	2.00pm – 5.00pm	Market Feasibility & Exploratory Research	Cathy Winston
Monday 20 th	2.00pm – 5.00pm	Technology Assessment & Commercialisation Opp.	Brian O'Kane
Thursday 23 rd	2.00pm – 5.00pm	New Product Development & Innovation	Frank Munnelly
Thursday 30 th	2.00pm – 5.00pm	Managing Legal Aspects of Start Ups	Peppe Santoro
November:			
Monday 3 rd	2.00pm – 5.00pm	IP, Trademarks and Copyright	Cathal Lane
Thursday 6 th	2.00pm – 5.00pm	Developing a Marketing Plan	Geraldine Lavin
Monday 10 th	2.00pm – 5.00pm	Sustainable Competitive Advantage & Positioning	Brian O'Kane
Thursday 13 th	6.00pm – 9.00pm	Technology Sales	John Collins
Monday 17 th	2.00pm – 5.00pm	Finance & Cash Flow	John Crawley
Thursday 20 th	2.00pm – 5.00pm	Venture Capital & Funding Models	John Eager
Monday 24 th	2.00pm – 5.00pm	Bringing it all Together: Business Planning	Geraldine Lavin
Thursday 27 th	2.00pm – 5.00pm	From Lab to Product: Pitching Event	Andrew Keogh

5. University of Huddersfield, United Kingdom: Entrepreneurship education across all Schools and how to train the trainers

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Abstract



Entrepreneurship education (EE) at the University of Huddersfield (UoH) combines strong profiles in curricula offers, extra-curricular activities and organisational set-up. The UoH is one of a few UK universities to offer new venture creation degrees: the UoH's Business School offers bachelor, masters, and doctoral degrees involving to start an enterprise. However, the most striking characteristic of EE at the UoH may be that EE teaching is "everyone's responsibility". Embedded EE is offered in all of the university's seven academic Schools. The UoH's strategy provides that by 2018 each student is to encounter EE in his or her study. This approach is enabled by a concept that does not only promote "entrepreneurship" as starting a business but also, more generally, "enterprising" as making ideas happen. The UoH also offers major extra-curricular EE activities, mainly through the UoH's Enterprise Team but also activities by teachers from various schools. As regards organisational set-up of EE, there is strong support from the university's management. The Vice Chancellor put in place a supportive infrastructure with the appointments of a Pro-Vice Chancellor for Research and Enterprise, a Director of Research and Enterprise, and a Head of Enterprise. The UoH's Enterprise Team unit is an important element in the UoH's EE approach. The Enterprise Team helps UoH students and graduates start their business and it encourages and supports teachers especially from non-business Schools to teach entrepreneurship themselves. Moreover, entrepreneurs and businesses contribute to the design of the curriculum and help support students in many ways. While some EE activities are co-funded by the national government and the EU, the UoH's EE profile may largely be due to leadership that other universities could emulate fairly easily.

Case study fact sheet

▪ Full name of the university, town, country	University of Huddersfield (UoH), Huddersfield (150,000 inhabitants; 10 th largest town in UK), United Kingdom
▪ Legal status	Public
▪ Campuses	Queensgate, International Study Centre (on main campus)
▪ Year of foundation:	1825 (Science and Mechanic Institute), formal name "University of Huddersfield" since 1992.
▪ Number of students (year):	20,435 (2012/2013) (Source: HESA 2014a)
▪ Number of employees:	1,035 (academic); 1,480 (non-academic); 165 (academic atypical) (Source: HESA 2014b)
▪ Budget in most recent financial year:	Income 2013: 142.5 million £ (approx. 174.5 million €) (According to UoH Financial Statements 2013, p. 11)
▪ Academic profile:	Academic schools: Applied Sciences; Art, Design and Architecture; Computing and Engineering; Education and Professional Development; Business; Human and Health Sciences; Music, Humanities and Media. Entrepreneurial University of the Year at Times Higher Education (THE) awards 2012; University of the Year at the THE awards 2013.
▪ Entrepreneurship education profile:	Degree courses at the Business School embed entrepreneurship into the curriculum; teaching EE is "everyone's responsibility"; every student shall encounter EE by 2018
▪ Activities focused in this case study:	Curricular offers and extra-curricular activities in EE across the university and how the UoH "teaches the teachers" about EE

▪ Case contact person(s):	Gatekeeper: Kelly Smith, Head of Enterprise Team
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Information included in this case study is from end of year 2014 unless stated differently.

5.1. The university's entrepreneurial profile

5.1.1. The university's overall approach to entrepreneurship

Key characteristics of EE at the UoH

Entrepreneurship education (EE) at the University of Huddersfield (UoH) combines strong profiles in curricula offers, extra-curricular activities and organisational set-up. As regards curricular offers, EE is a key part of the UoH's strategy. The university targets to ensure that every student encounters EE at some point in his or her study by 2018. Notably, the UoH defines EE not only in the common meaning as "entrepreneurship" and "venturing", i.e. starting a new business, but also more generally as "enterprising", i.e. having an idea and making it happen. Correspondingly, on the teachers' side, a striking characteristic of the UoH is that teaching about entrepreneurship and enterprising is "everyone's responsibility". This case study pays special attention to this issue. It raises the ensuing issue how the UoH ensures that those teaching about entrepreneurship are qualified to do so, i.e. how the UoH "teaches the teachers". The UoH pursues a diverse approach in this respect. Thus, this case study presents a broader picture of what the UoH offers in EE as well as a more specific view on how the UoH supports the offers.

Publicity of the UoH case

The University of Huddersfield received the Times Higher Education (THE) award for the "**Entrepreneurial University of the Year**" in the UK for 2012. The UoH received the award for its "entrepreneurial outlook championed at the highest levels of the institution".⁷² This included establishing an innovation centre, working with national entrepreneurship bodies, regional leadership in fostering student and graduate business start-ups, an excellent record in student employability and self-employment, and top national ranks in various higher education indicators. As regards curricular EE, the UoH "was also commended for the way in which degree courses embed entrepreneurship into the curriculum and in particular for the BA in Enterprise Development".

In 2013 the UoH was furthermore awarded the title "**University of the Year**", also due to its entrepreneurial profile. The UoH's support for entrepreneurship education has been included as a case study in three influential policy reports to UK Government (see Wilson 2012, Witty 2013, Young 2014). Already in 2009, the work by John Thompson, now emeritus professor in entrepreneurship, was recognised by a Queen's Award for Enterprise Promotion. It also honoured setting up the UoH's Business Mine, the precursor to the Enterprise Team.

Due to these awards the case of EE at the UoH may be well-known in the UK. However, the UoH apparently has not yet reached considerable international attention. The reason may be that most of the UoH's major entrepreneurial activities were launched since 2009 and are thus fairly recent.

5.1.2. Leadership and governance

Importance of government strategies

The UoH's focus on entrepreneurship and EE is influenced by the importance which the UK government attributes to EE. However, the UoH also influences national and regional government strategies and programmes. For example, UoH's Head of Enterprise Kelly Smith is a co-author of the UK's Quality Assurance Agency's national guidelines for enterprise and entrepreneurship education in higher education from 2012 and a 2014 report for the UK Government's All Party Parliamentary Group for Microbusiness on an "education system fit for an entrepreneur" (Anderson et al. 2014).

⁷² Quoted from <http://www.hud.ac.uk/about/the-university/our-awards/the-entrepreneurial-award/>.

Importance of entrepreneurship in the university's strategy

Entrepreneurship and entrepreneurship education are core parts of the UoH's strategy. One of three aims of the UoH's "**Teaching and Learning Strategy 2013-2018**" is "to inspire employable and enterprising graduates". The two other aims are "to inspire our students to attain the highest academic and professional standards" and "to inspire our students to enjoy an outstanding university experience". "Enterprising Students" is the second of six "enabling strands" supporting the delivery of the three overall aims. The enterprising students strand contributes to all three.

Extent of high level commitment to implementing entrepreneurship

The theme of **enterprise and entrepreneurship is promoted at the highest level** by UoH's Vice-Chancellor,⁷³ Professor Bob Cryan, and through the Deans of Schools working with the Research and Enterprise office. The teaching and learning strategy, which includes the Enterprising Students strand described above, is led by Professor Tim Thornton, Pro Vice Chancellor for Teaching and Learning. While the UoH always had a practical, business-oriented and entrepreneurial flavour, entrepreneurship became an explicit objective when Bob Cryan became Vice Chancellor in 2005. Since then "it has been strengthened, strengthened and strengthened", as Head of Enterprise Kelly Smith said. She also said that the majority of staff were very proud of being awarded the title of "Entrepreneurial University of the Year". The UoH's Annual Review 2012, the most recent issue at the time of writing this case study, strongly emphasised the UoH's mission to support enterprise and entrepreneurship. There were however some "agnostics" (Kelly Smith) and also some resistance. Tim Thornton said that "we need to explain the benefits of enterprising and entrepreneurship for other parts of education and research" in order to decrease such resistance.

Level of faculties' and units' autonomy to act

As Kelly Smith explained, the **UoH's academic schools are largely independent**: "Schools are responsible for the implementation of the University's teaching and learning strategy and will be required to do so, but they have a large amount of autonomy in how it is done. They will be expected to produce School-level plans for delivery and report on progress." The strategy's strand "Enterprise modules (...) to be provided at each level of every course" implies that Schools must provide at least one enterprise-related module in every year of every course. This may be about "being enterprising" but not necessarily in terms of new venture creation – the Schools will be free to decide how. According to Kelly Smith, "there is also encouragement to provide additional degrees and courses related to enterprise and entrepreneurship, but no explicit pressure to do so and no requirement in the teaching and learning strategy".

Organisational implementation

The UoH's approach to EE is largely decentralised. The UoH thus has a "radiant" approach to entrepreneurship education. While the Business School offers three degrees in entrepreneurship, it has only one Professor for entrepreneurship. It does not offer entrepreneurship education at the other schools although it may provide support to non-Business colleagues. Where enterprise or entrepreneurship is included in a course of study, it will most likely be taught by teachers with a different core thematic expertise. There are three ideas behind this approach. The first is credibility and cultural proximity: non-business students may not accept being taught by business professors but they do accept it from the professors in their school. Second, there is an issue of scale: A decentralised approach may help enabling all students at the university have an enterprise education experience at all levels of their course, as targeted by 2018 – this could be difficult to be achieved with a centralised EE unit. A third advantage is that it allows EE to be contextualised to the students' subject of study – potentially industry-specific rather than generic.

University's importance for driving entrepreneurship in its environment

The UoH plays a **vital role in regional entrepreneurship**, manifested in a leading role in the regional university co-operation "Graduate Entrepreneurship Project", the 3M Buckley Innovation Centre, and board memberships.

⁷³ At the UoH as in the UK university system in general, the Vice Chancellor is the highest executive position, while the Chancellor has a rather representative function.

The UoH is the lead partner in the **Graduate Entrepreneurship Project**⁷⁴ (GE) funded with £2.7 million from the European Regional Development Fund (ERDF). GE is a collaboration of the ten Universities across Yorkshire and the Humber, one of England's nine official regions. ERDF funding ceased in November 2014 but the partners are committed to continuing with non-funded collaborative activity.

The UoH also supports the region's innovative small and medium-sized enterprises (SMEs) through the **3M Buckley Innovation Centre** (3MBIC)⁷⁵ located on campus. 3MBIC was funded by the ERDF, Kirklees Council, 3M, and the UoH. It opened in 2012. This centre provides state of the art facilities, facilitating partnerships between businesses and with the university. 3MBIC houses start-ups, SMEs, and large corporations. The Centre offers access to finance, markets and technology through a range of commercial, technical and support services. Tenants and network members are encouraged to establish close working relationships with the UoH's staff.⁷⁶ The UoH's Enterprise Team unit is based in the Duke of York Young Entrepreneur Centre housed in the 3MBIC.

The UoH's role in developing regional entrepreneurship also manifests itself in **memberships on regional boards**.⁷⁷

5.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

The UoH seeks to involve university teachers from all UoH Schools into EE. The UoH has also an entrepreneur in residence and it involves entrepreneurs in EE. For example, 3M New Ventures President Stefan Gabriel is Visiting Professor of Innovation, and Theo Paphitis, owner of three UK retail chains, champions the BA Enterprise Development degree and has given Master classes to enterprising students and graduates.

Financial resources for entrepreneurship education

The UoH funds its EE offers and extra-curricular activities through several public and private sources. For curricular-based activity, as enterprise teaching and learning will be embedded as a core part of every course by 2018, sustainability is built in. Enterprise Team staff in the university's student and graduate business start-up unit, who deliver the Enterprise Placement Year and provide extra-curricular start-up support, are funded through the UK's Higher Education Innovation Fund (**HEIF**). HEIF also provides small micro-finance grants. The UoH recently became a "**Santander University**", joining an alliance with the Santander bank which comes with some funds to support business start-up as well as engagement with a national business planning competition. Some start-up support activity and micro-finance grants were funded through the European Research and Development Fund (**ERDF**) as part of the Graduate Entrepreneurship Project. The UoH is currently looking for funding to supplement HEIF.

Moreover the UoH gained funds to promote social enterprise from the Higher Education Funding Council for England (**HEFCE**). This funding finished in August 2013, but the UoH set up a social enterprise consultancy unit as a result where some of the income generated will be used to sustain micro-finance grants for social enterprise.

⁷⁴ See <http://graduateentrepreneurship.co.uk/>.

⁷⁵ See <http://www.3mbic.com>.

⁷⁶ See <http://www.3mbic.com/about/>.

⁷⁷ Vice Chancellor Bob Cryan: Leeds City Region LEP Board and its Business, Innovation and Growth Panel; Pro Vice Chancellor Tim Thornton: Employment and Skills Panel; Enterprise Team Leader Kelly Smith: Enterprise Education Group; Liz Towns-Andrews: Kirklees Employability and Skills Board and Deputy Chair of the Yorkshire Universities' Knowledge Transfer (KT) Directors' Network.

5.2. Entrepreneurship in curricula and teaching

5.2.1. Overview of curricular offers and units providing them

Curricular EE offers at the UoH

The UoH has curricular EE offers in all schools. Using the terminology of the National Centre for Entrepreneurship in Education, the UoH offers **three types of curricular offers**, by decreasing level of formalisation and contents: (1) full awards or qualifications in enterprise and entrepreneurship, (2) credit bearing enterprise and entrepreneurship modules, (3) embedded modules with enterprise and entrepreneurship. Furthermore, a placement opportunity, the **Enterprise Placement Year**, supports students as they set up their own business instead of working in employment. Exhibit 1-2 shows an overview about some of the most prominent curricular offers in entrepreneurship education at the UoH.

Exhibit 5-1: Overview about prominent curricular EE offers at the University of Huddersfield

No.	Name, degree	Objectives	Target groups	Offered since [year]	No. of participants in [year]
(1) Degree offers					
Business School					
1	BA Enterprise Development	"Designed to help young entrepreneurs start and run their own business whilst studying for a degree". Three-years full time.	"Students of any age" (Course description)	2009/2010	20 places available (2014/15: six seeking the degree)
2	BA Entrepreneurship and Business	Substantial elements of enterprise education; no expectation of actual business start-up	Students whose "ambition is to succeed as an entrepreneur and to develop and progress [their] ideas in the marketplace" (course description)	2005/2006	30 places available (2014/15: 24 seeking the degree)
3	Masters of Enterprise (MEnt)	"The emphasis is on enterprise creation and personal entrepreneurial development within the chosen area, rather than on the study of business organisations." One year full time or two years part time "research degree with little or no taught component".	Students "wishing to explore a potential business or social enterprise idea, either to start-up their own business or for a new venture within public- or private-sector organisations" (course description)	2010/2011	10/2014: three current students
4	Doctor of Enterprise	Same as for MEnt	"students whose emphasis is on the need for research to underpin a new business, social enterprise, or innovative service idea" (Course description)	2010/2011	10/2014: seven current students
(2) Credit modules (exemplary)					
School of Music, Humanities and Media					
	Magazine Design and Production	Increasing (self-)employment opportunities through practical learning how to launch a new	BA(Hons) Journalism BA(Hons) Music	n.a.	n.a.

		magazine	Journalism BA(Hons) Sports Journalism BA Hons Business with Design		
Other offers					
	Enterprise Placement Year	Supporting students in preparing to start an own business	All students	2004	20
	Games-Industry Enterprise Placement Year	Supporting students in preparing to start their own games business	Students in the School of Computing and Engineering	2014	10

Curricular EE offers at the Business School

The UoH's Business School has around 6,000 full-time, part-time and distance learning students. This means that almost one third of the UoH's students are at the Business School. It has five departments: Accountancy, Leadership and Management, Logistics and Hospitality Management, Strategy and Marketing, Law School.

The most prominent EE offers are **full awards**. The UoH's Business School offers "three programmes of study which explicitly provide opportunities for students to start-up their own business or social enterprise, or to develop a new service innovation".⁷⁸ These three programmes cover all three levels of higher education: bachelor, master and doctor. There is a Bachelor of Arts in Enterprise Development, a Master of Enterprise (MEnt), and a Doctor of Enterprise (Ent D). Furthermore there is a BA in Entrepreneurship and Business. The BA in Entrepreneurship and Business will include substantial elements of enterprise education, but there is no expectation of actual business start-up. The MEnt and EntD are also offered by other academic Schools, too, as they are research degrees. Students will register with the academic school that best meets their research requirements.

Beside the full awards there are **other entrepreneurship-related offers** at the Business School. In Transport and Logistics, enterprise is taught through financial, commercial and marketing modules. Within the Business Management course they have specific modules, such as personal development, business enterprise and an employment module, which are more explicitly enterprise modules. Events Management students at the Business School design and deliver real events linked to the Prince's Trust Million Makers competition.

Curricular EE offers outside the business school

In 2010 and 2012, the UoH's academic schools were required to self-report their EE modules according to the descriptions of the National Centre for Entrepreneurship in Education (NCEE). The UoH's Teaching and Learning Institute carried out a **baseline audit** of course descriptors in 2013 so that the UoH can look at the future impact of its Enterprising Students strategy theme. They found that the "enterprising modules" strand of the UoH's strategy "produced many responses, despite the number of courses not having definitive modules in enterprise". Experience suggests that enterprise activity in the modules is not always made explicit. The following lists some exemplary offers:

- The **Drama degree** programme at the School of Music, Humanities and Media does not have an enterprising module as such, but the teachers in charge encourage students to do free-lance work. They also have a student theatre company which gives the students the mechanics on how a theatre would work and how to budget.
- **Music Technology and Audio Systems**, also at the School of Music, Humanities and Media, has an enterprising module named "Business in the Music Industry" in the final year, where students learn how to draw up contracts and manage businesses within the music industry.

⁷⁸ See <http://www.hud.ac.uk/research/developmentarea/enterprise/enterpriseinthecurriculum/enterprisedegree/s/>.

- In **Architecture** at the School of Art, Design and Architecture, students have to draw up contracts in respect to buildings, and planning permission, providing students with the tools they need to start a business after their academic study.
- **Computer Games Design** students from the School of Computing and Engineering can apply for a sandwich placement where they run their own games studio for programme accreditation, Canal Side Studios. At the same school there is a project tasking students to publish a game for a mobile device, which has enterprising aspects such as personal marketing skills, in which they develop simultaneously to differentiate their product from others.

Exemplary curricular offers

The following box text describes an EE offer in more detail: “Magazine Design and Production”, offered at the School of Music, Humanities and Media. This offer was selected for this case study because it is long-established and successful.

Magazine Design and Production (School of Music, Humanities and Media)

The UoH’s School of Music, Humanities and Media runs a module “Magazine Design and Production”. It “analyses the diversity and complexity of the magazine market and considers the nature of design and production. The economics, costs, techniques, and organisation of design and production are examined and the nature of the publishing industry investigated.” The module is core for general Journalism students and offered as an elective to students of Music Journalism, Sports Journalism, and Business with Design. Caroline Pringle, Senior Lecturer Digital and Practical Journalism, runs the module. According to the UoH, “the module offers a holistic view of the magazine industry and production process; it allows students to see through a project from conception idea for a magazine, to the production of a dummy copy, via market research, budgeting, design iteration and marketing. All of this is then presented to a Dragon’s Den style panel of Industry professionals that the staff group have built up over the years.” In the first term, the delivery of the module is fairly traditional via lectures – also including visiting practitioners – as well as seminars and practical design workshops. In the second term students work in groups as a business team, taking on responsibility for design, editorial, business and finance. The project culminates in a twelve-page dummy copy of a magazine with representative copy, design and advertising as well as evidence of market viability, marketing strategy, basic balance sheet and basic business plan. The UoH considers this module as a good practice in enterprise education and enhancing employability.

Source: University of Huddersfield, description sheet for the module “Magazine Design and Production”. For a more elaborate description see the annex of this case study.

Enterprise Placement Year (all Schools)

The Enterprise Placement Year is a year-long accredited module of study. Students explore self-employment instead of working in a company as they would in a traditional placement. By the time of writing this case study it was already available to the majority of students, although spaces were limited. Schools were being encouraged to create their own enterprise or innovation-related placement years in addition to the generic EPY. An example was a game-industry enterprise placement year launched in 2014 by the School of Computing and Engineering with ten students looking to start-up three games businesses.

Source: Kelly Smith, UoH Enterprise Team, 2014

5.2.2. Target groups

Main target groups of entrepreneurship education

The UoH targets all students to learn about enterprising and entrepreneurship. Statistics show that this objective is currently only partly fulfilled. The bi-annual mapping survey for 2012 of the National Centre for Entrepreneurship in Education (NCEE) shows that in 2012, the total **number of offers and students participating differed largely between the schools**. It was by far the largest in the School of Art, Design and Architecture (ADA) which offered 71 embedded

modules and 4 credit modules. The ADA School also counted the largest number of students involved: 2229 for embedded modules and 222 for credit modules (per module, so double counting may occur). The reason is that most ADA graduates start their own business sooner or later. The Business School had 17 modules and 775 students, followed by the Schools of Music, Humanities and Media (8 modules, 503 students), Applied Sciences (6 modules, 249 students) and Computing and Engineering (4 modules, 230 students). At two schools there was not much EE activity: The School of Educational and Professional Development (3 modules, 82 students), and the School of Human and Health Sciences (3 modules, 54 students). The typical graduate's career in these schools was to work for public services or charities. However, interviewees mentioned increasing interest for example in social entrepreneurship from this school.

In the 2013 audit by the UoH's Teaching and Learning Institute, the **challenge in the UoH's strategy strand about enterprise modules** became evident in those courses where enterprising modules were not yet embedded because course teams perceive their course as being one which does not particularly need enterprising aspects. This applied for example to Youth and Community Work, Criminology, Health & Nutrition, Photography and Childhood Studies. All these courses do, however, have guest speakers from their discipline and placement students sharing their experience with second-year students. An audit of academic School's performance in 2014 showed that the majority of Schools either complied or were close to complying with the strategy requirement of an enterprise module against QAA guidelines.

Continuous education

The UoH offers some continuous education in EE, i.e. education for people who already left university and were employed elsewhere. However, the UoH does not put particular weight on such offers. The UoH offers support to its graduates up to five years from graduation through its Enterprise Skills series and Enterprise Support. These offers are not accredited. The Business School can offer bespoke short courses, and UoH's Master's level courses across all subject areas may include enterprise learning opportunities.

Bridges to secondary education

The UoH also builds bridges to EE in secondary school education. The UoH was founding partner in a regional business competition for 16-19 year olds named "Umph!". Various academic schools run "Dragon's Den" style competitions for secondary schools they are looking to recruit from. The UoH's Events Management lecturers created a competition for schools called "EVENTerprise". The UoH has strong links with the Kirklees Creative and Media Studio School and the Kirklees College Peter Jones Enterprise Academy. The UoH also partners in an initiative for young people – not only from secondary schools – in digital entrepreneurship named "iDEA - the inspiring Digital Enterprise Award".

5.2.3. Designing lectures and courses – basic curricular decisions

Objectives of entrepreneurship teaching

The UoH's "Teaching and Learning Strategy 2013-2018" formulates three overall aims which thus also applied to EE: "To inspire our students to attain the highest academic and professional standards", "to inspire our students to enjoy an outstanding university experience", and "to inspire employable and enterprising graduates". Within the six "enabling strands", Strand 2 about "enterprising students" had the following four specific objectives:

TB1. Tightening of definition of "work-related activity", present in all courses, to include significant "live" project & problem-solving elements.

TB2. Enterprise modules (against QAA enterprise learning outcomes) at each level of every course.

TB3. Volunteering opportunities developed.

TB4. Enterprise / innovation placement year and enterprise final-year module to be available to all students (subject to PSRB limitations).

Contents of entrepreneurship teaching

In its EE teaching, the UoH distinguishes between enterprise education ("having an idea and making it happen") from entrepreneurship education ("new venture creation"). "Enterprise education" has a broader meaning of realising innovations, not necessarily involving to start a

business. The UoH provides both types, depending on student and subject need. The Enterprise Team does not even promote using the term “entrepreneur” but prefers terms like “business owner”, “freelancer”, and “self-employed”. “Entrepreneur” may be used in programmes where the lead academic deems it to be appropriate, for example in the BA Enterprise Development degree.

The content of entrepreneurship teaching at the UoH differs according to the types of courses and the aspirations of the target groups. EE at the UoH “needs to be context-related”, said Pro-Vice Chancellor for Teaching and Learning, Tim Thornton, and other interviewees. The degree courses at the Business School offer the full range of business subjects needed to launch an enterprise on one’s own. All courses and modules across the university include, or are planned to include by 2018, practical insights needed to become enterprising or entrepreneurial. They are meant to motivate students to actually do so, supporting their career, which may be as an entrepreneur, self-employed or as an – enterprising thinking – employee. Entrepreneurship-related modules at non-business schools make the students familiar with business issues related to their School’s area of subjects, familiarising the students with things they need to know and be able to do in case of actually launching a business. Enterprise or entrepreneurship education can be presented as stand-alone modules, or embedded where Schools provide information that familiarises the students with the opportunities of behaving entrepreneurial in specific fields whilst studying their chosen subject.

Methods and media

The UoH provides a wide range of methods and media in EE. Methods include, but are not limited to, lectures and tutorials by staff or by guest speakers as well as case study workshops. A method to which the UoH attributes specific importance is enterprise placement for practical learning, live work-based elements and project work. Media include for example videos about business practice, and business simulation software. Similar to content, the range of methods and media applied differs by the types of courses.

The UoH also runs a strategic project related to software for facilitating enterprising and entrepreneurship. Supported by the University’s Teaching and Learning Institute, the UoH was in 2014 exploring how the **business simulation game SimVenture** could be rolled out across campus and used as a tool for embedding enterprise education in subjects as diverse as business, fashion and psychology. SimVenture is commercial software that was launched in 2006 and, according to the supplier in 2014, was used in more than 150 universities all over the world as well as in schools and in communities.

Informal evaluation of learning outcomes and feedback for students

Informal feedback to students about learning outcomes in EE, i.e. feedback regardless of formal marks and credits, differs by the teachers concerned. Generally the UoH encourages such informal feedback in order to reach the university’s overall aims, i.e. to inspire graduates for attaining the highest academic and professional standards, enjoying an outstanding university experience, and becoming employable and enterprising. The UoH’s Enterprise Team also provides such informal evaluation and feedback.

Using results of entrepreneurship research

UoH researchers frequently carry out empirical studies about entrepreneurship and EE at the own university and publish results in journal articles and conference papers (e.g. Smith at al. 2013). The UoH also seeks to implement the lessons learned from entrepreneurship research into teaching. UoH teachers share practice through best practice sessions organised with bodies such as Enterprise Educators UK (EEUK), Institute for Small Business and Entrepreneurship (ISBE), VITAE (a national organisation for postgraduate research students and early stage researchers), and through presentations at relevant national and international conferences.

5.2.4. Setting of entrepreneurship teaching

EE at the UoH does take place in the university’s lecture halls and classrooms, but may be more likely to be found in studios, workshops, and laboratories, and also in businesses through long- and short-term placement opportunities. Occasionally there are also excursions to enterprises in the region and other locations outside the university. Such change of scene is supposed to enhance learning experiences and increase learning motivation.

5.2.5. Instructors: teachers and mentors

Professors, other employees and external lecturers of the university

Teaching staff are primarily academics in their subject-specific area although many modules include guest speakers from industry. The UoH has only a few teachers who deal exclusively with entrepreneurship. At the end of 2014, the Business School's staff list named eleven professors, among them one explicitly for "entrepreneurship", Gerard McElwee.⁷⁹ There is also an emeritus professor in entrepreneurship, John Thompson.

Kelly Smith explained that at the UoH teaching enterprise and entrepreneurship is "everyone's responsibility". Most teachers who impart EE at the UoH have another specialty and teach enterprising and entrepreneurship on the basis of additionally acquired knowledge and experience. This is part of the UoH's specific approach to EE. However, there is no compulsory requirement for UoH teachers to teach about enterprising and entrepreneurship. So the UoH does not see a need to make teaching the teachers obligatory. One of the interviewees from the Department of Informatics said that one cannot compel teachers to teach entrepreneurship. Rather, there need to be ambassadors for such teaching within the departments.

In 2012/2013, the UoH introduced a new promotion route for enterprise activity: the title of "Principle Enterprise Fellow", equivalent to "Reader" and "Principal Teaching Fellow".

"Real entrepreneurs" as teachers

All UoH programmes of study are required to have industry or professional input into the approval process. In many instances this will involve small business and entrepreneurs. For example, the School of Art, Design and Architecture regularly benefits from co-operation with industrial designers.⁸⁰

The University has an **Entrepreneur in Residence** – Professor Graham Leslie⁸¹ – based at the 3M Buckley Innovation Centre (3MBIC).

The University is also working with two **Visiting Professors** from the Royal Academy of Engineering: President of 3M New Ventures Stefan Gabriel⁸² and Jonathan Sands, the CEO of leading brand agency Elmwood. They explore and deliver enterprise and entrepreneurship education opportunities. More recently, Alan Lewis, one of the UK's top businessmen, was appointed Visiting Professor in Entrepreneurship.

The UoH has a **Royal Society Lifetime Industry Fellow**, and collaborative research fellows linked to strategic partnerships with industry.

Mentors

The UoH's Business School has an Advisory Panel with entrepreneurial representation.⁸³ It also has schemes with partners in law and accountancy which provide students with networking, mentoring and training opportunities via internationally renowned legal and accountancy firms.⁸⁴

5.2.6. Management of entrepreneurship education

Teacher and trainer management

"Teaching the teachers" is a particularly important issue at the UoH because the teachers at the different schools teach about enterprise and entrepreneurship issues while their main expertise is in a different academic discipline. The UoH has a multiple approach to teaching the teachers, consisting of internal and external elements:

⁷⁹ Last accessed June 2014.

⁸⁰ See <http://www.hud.ac.uk/research/researchcentres/circ/externalrelationships/>.

⁸¹ See <http://www.hud.ac.uk/business/visitingprofessors/grahamleslie/>.

⁸² See <http://www.hud.ac.uk/news/allstories/3mpresidentbecomesvisitingprofessor.php>.

⁸³ See <http://www.hud.ac.uk/uhbs/businessschool-about/advisoryboard/>.

⁸⁴ See <http://www.hud.ac.uk/uhbs/businessschool-about/partnersinlaw/>.

- (1) **Internal information:** The Enterprise Team aims to be present at all relevant networking events at the UoH in order to talk with teachers about EE and offers to support related teaching. The Enterprise Team has built up a network of EE “ambassadors” across all schools who help spread information about EE and the Enterprise Team.
- (2) **Internal consulting on demand:** On demand, the members of the UoH’s Enterprise Team consult teachers – individually and in groups – about how to teach enterprising and entrepreneurship. Such inquiries reach the Enterprise Team about once a week. Head of Enterprise Kelly Smith said she has “a suite of presentations and workshops that I run as required by academic schools”. If teachers need industry-specific information, the Enterprise Team can help retrieve it by tapping into a licensed business reference resource. In some cases the UoH’s Teaching and Learning Institute (TALI) helps.
- (3) **Internal workshops for open audience:** The UoH also offers workshops for an open audience. In January 2014 TALI held a half-day workshop called “Enterprise Matters” which is planned to become a separate annual event.⁸⁵
- (4) **External training:** The UoH is member of EEUK, the UK’s national network for enterprise educators which has the objective “to support our members to increase the scale, scope and effectiveness of enterprise and entrepreneurship teaching within their institutions” (<http://www.enterprise.ac.uk/>). Some members of UoH staff attended Best Practice Workshops.
- (5) **Internal and external conference participation:** EEUK also offers an annual International Entrepreneurship Education Conference. On site, enterprise regularly features within the UoH’s annual Teaching and Learning Conference. The 2010 conference had enterprise explicitly in the title.⁸⁶

The Enterprise Team’s approach is to encourage and to **empower teachers to teach EE themselves**. This has several reasons: The Enterprise Team is small and cannot deliver many lectures across the university; it increases respect for the teacher among students if he or she teaches EE him- or herself; and students are more willing to take up knowledge from a teacher with the right pedigree. Thus, individual consulting of teachers about EE often takes the form of encouragement to use and build upon own existing expertise. Kelly Smith said that oftentimes teachers have more entrepreneurial expertise than they are aware of, for example from working as freelancers or from working as “enterprising” employees in specific industries.

As EE teaching is voluntary and as the UoH is a large institution, one could assume a **communication challenge** to make the offers for teaching the teachers known among teaching staff. Due to the “Entrepreneurial University of the Year” award in 2012 and the related promotion, every UoH teacher should either know about the existence of the Enterprise Team or know someone who can direct to this team. Furthermore, the Enterprise Team communicates their offers through the UoH’s central marketing team.

Research for this case study suggests that this scope of teaching the teachers ensures a sufficiently high **quality of EE teaching** at the UoH. As the lecturer from the School of Music, Humanities and Media who runs the “Magazine Design and Production” module said: “We don’t have the strict business knowledge, but it’s not necessary, what we have is industry expertise.” In this module, if specific expertise is needed which the teacher cannot provide, they invite guest speakers, often alumni, for example in the panel for magazine assessment.

Managing student support

The UoH has a unit dedicated to managing student support in the field of entrepreneurship, the **Enterprise Team** headed by Kelly Smith. The Enterprise Team is there, according to its homepage, “to support you right from the beginning to help you grow your seed of an idea into a successful business”. The Enterprise Team offers support not only to current students but also to those who graduated within the past five years. It offers “one to one business advice and coaching” as well as hot desk facilities in the Duke of York Young Entrepreneur Centre with free access to computer, printer, telephone and meeting rooms. Students may also apply for a Proof of Concept Grant of up to £500. Support may be continuous; the Enterprise Team invites to

⁸⁵ See http://www.hud.ac.uk/tali/projects/sp_enterprise/ent_matters/.

⁸⁶ See proceedings at http://www.hud.ac.uk/tali/prof_dev/tl_conf/.

“periodic updates to review your progress”⁸⁷. The Enterprise Team also offers a free events series providing an introduction to various aspects of business and self-employment. Sessions include advice on writing a business plan, researching the market, branding a product and developing essential networking skills.⁸⁸ The status of being a Santander University (see section 1.1.3 above, financial resources) helps the UoH provide additional proof of concept and business start-up grants, and enables participation in national Santander pitching and business planning competitions for students and recent graduates.

Internal and external network management

The UoH offers regular opportunities to discuss and share opinions and experiences about EE. Enterprise education often emerges naturally in other teaching and learning and support services events, too. Entrepreneurs, who may be alumni, are often invited back for guest lectures through academic schools and staff contacts. Alumni of the Enterprise Team’s student and graduate entrepreneurship support regularly return to speak to the next generation of supported students and the UoH can link them into academic schools too as required.

Management of curricular integration and attracting new groups of students

The UoH manages the integration of enterprise and entrepreneurship modules into curricula through its defined overall aims, its strategy and, operationally, through the Enterprise Team. In this way all students will deal with enterprise or venturing at some point of every course.

Evaluation of courses and programmes

Each School at the UoH is required to respond to the teaching and learning strategy with plans to the University’s Teaching and Learning Committee for approval – this will include explicit reference to enterprising students. Also, in 2014, the annual evaluation of teaching and learning included the following question: “How are enterprising skills being defined and developed in student work?” Individual module evaluations will differ and enterprise activities may or may not be explicitly covered. The UoH encourages academic staff to evaluate this however, and can support them to publish or present at conferences.

5.3. Extra-curricular activities in entrepreneurship education

Overview about extra-curricular EE activities at the UoH

The UoH offers numerous extra-curricular EE activities which are however not focused in this study. Some are directly dealing with entrepreneurship or enterprise, others just include it among other themes. Activities directly related to EE include, above all, the Enterprise Team’s activities: business skills workshops, general enterprise support, the SimVenture business simulation game, Collabhub and Huddersfield Enterprise Society meetings and social media platforms. On a regional level, the Graduate Entrepreneurship project is directly about EE. Activities dealing with EE among other themes include an annual teaching and learning conference that also deals with being enterprising. See Exhibit 1-3 for extra-curricular activities at the UoH.

Start-up support from the UoH’s Enterprise Team

The UoH’s **Enterprise Team** supports around 100 individuals in around 80 pre-start companies a year, of which at least 35 will convert into sustainable business start-ups. Support is provided in two tiers:

1. Enterprise Awareness: Primarily a series of 15 to 20 **business skills workshops** a year with each attracting 25 to 50 attendees.
2. Enterprise Support: Up to a year’s free pre-start and early stage **start-up support** including access to business advisors, hot desk office space in the UoH’s Duke of York Young Entrepreneurs Centre which is part of the 3M Buckley Innovation Centre, micro grants for proof of concept, and other services for students and recent graduates up to five years from graduation.

⁸⁷ See <http://www.hud.ac.uk/enterprise/enterprisesupport>.

⁸⁸ See <http://www.hud.ac.uk/enterprise/enterpriseawareness/>.

There also used to be an activity named **Activ8 Your Business**, an intensive six-month support scheme with a start-up grant for recent graduates and new venture creation degree students. It ended in August 2013 due to the immanent closure of the ERDF programme that funded it.

Exhibit 5-2: Overview about extra-curricular EE activities at the University of Huddersfield

No.	Name	Objectives	Target group	Offered since [year]	No. of participants in [year]
Direct relation to EE					
1	Business skills workshops	Raising awareness for enterprise and entrepreneurship	UoH students and graduates	2007	25 – 50 per workshop (2014)
2	Start-up support	Up to one year start-up support (finance, office space in Duke of York Young Entrepreneurs Centre)	UoH students and graduates	2006	≈ 100 (2014)
3	Graduate Entrepreneurship Project	Promote entrepreneurship, advise about it, and facilitate access to start-up resources	Students and graduates in Yorkshire and Humber Region	2009 (Transferred to UoH as Lead Partner)	≈ 8,800 (2010 – 2014)
4	Honeypot	Software and event to pitch start-up ideas and assemble teams	UoH students	2013	880
5	Innovation and Creative Exchange (ICE)	Lectures, workshops, networking events and skill exchanges aiming to bring the best of innovative design and industry thinking into the undergraduate curriculum	Engineering and design students	2013	(2013 – 2014, Honeypot and ICE together)
Indirect relation to EE					
7	Annual conference “Teaching and Learning”	Enterprise and entrepreneurship featured in some way.	Academic teaching professionals	2006	≈180
8	SimVenture business simulation game	Tool for embedding enterprise education in different university subjects.	To be defined	2014	≈ 20
9	Collabhub	Pitching ideas for enterprising projects and find collaborators	All UoH students, also UoH staff and community members	2013	> 50 (2014)

Collabhub: a new type of enterprise society

Until very recently, the University did not have a traditionally recognised “enterprise society”. Huddersfield Enterprise Society was founded in December 2014 and launched in January 2015. However, a new type of enterprise society was seeded in 2013 by a senior lecturer in Music Technology, Elizabeth Dobson, and is generating much attention, internally and externally:⁸⁹ Collabhub – Innovation Through Collaboration. Collabhub encourages students from all disciplines to pitch ideas for enterprising projects and find collaborators – including staff and members of the local community – through Facebook or face-to-face events. Collabhub is an

⁸⁹ See also Dobson (2015).

example of an initiative that is rather unintentionally “entrepreneurial”, as Elizabeth Dobson said: “Initially I had no 'affinity' with the terms enterprising or entrepreneurship. I recognise that CollabHub is enterprising, and how incredibly enterprising our students are by way of this 'platform'.”

Honeypot: using software to assemble start-up teams

Honeypot stands for Huddersfield Open Network for Enterprise Creativity, Prototype Design and Test. It provides special software that enables UoH students to pitch their ideas and then assemble teams of fellow students who between them have the requisite set of skills. Honeypot is interdisciplinary, it targets students from arts and computing: 500 second-year students from selected courses within the UoH’s School of Art, Design and Architecture and School of Computing and Engineering are eligible to register. There are prizes to win: The idea that in the end scoops the most votes wins a set of vouchers. Some projects may also receive funding for proof-of-concept. Stefan Gabriel, President of 3M New Ventures mentors the project.⁹⁰ Honeypot is financially backed by the Royal Academy for Engineering. While Honeypot is currently extra-curricular, additional curriculum-based elements are planned.

Start-up events

The UoH offers several rather traditional events to support start-ups and entrepreneurial behaviour. **Innovation and Creative Exchange (ICE)** is a series of lectures, workshops, networking events and skill exchanges – and also a more untraditional “24 hour design challenge”. It aims to bring “innovative design and industry thinking into the undergraduate curriculum” and to embed “innovation and design methodologies into the curriculum for engineering and design students”.⁹¹ Like Honeypot, ICE is financially backed by the Royal Academy for Engineering.

Among the extra-curricular activities that include EE among other themes is an **annual “Teaching and Learning” conference** where enterprise and entrepreneurship education has featured in some way every year for at least since 2010. For example, the theme of the 2010 conference was “Connections between Teaching and Learning and Research and Enterprise”.

Graduate Entrepreneurship Project: regional universities support start-ups

On a regional level, the **Graduate Entrepreneurship Project (GE)** partners all ten higher education institutions in Yorkshire and the Humber to provide start-up support to students and graduates. The UoH has been the lead partner since 2009. The project enables each institution to provide a wide range of enterprise support in terms of guidance, finance or networking with like-minded individuals. According to GE’s website, the project is “widely recognised as an exemplar of best practice in enterprise education in the UK and EU”.⁹² Specifically, it offers business start-up advice, proof-of-concept funding up to £1,000, start-up grants up to £2,500, an annual four-day residential boot camp, and an annual awards scheme. GE attracted £1.3 million of investment from the European Regional Development Fund (ERDF) as part of Europe’s support for local economic development through the Yorkshire and Humber ERDF Programme 2007–13. Between September 2010 and March 2014, the project worked with over 2,600 student and graduates looking to start-up, with over 8,800 attendees to start-up events.

Managing extra-curricular activities

Research findings for this case study suggest that managers of extra-curricular activities may not necessarily need any instructions or training in order to “instruct” about enterprise and entrepreneurship. Motivating may be more important, as Elizabeth Dobson, initiator of the Collabhub initiative, said: “I’m not sure what 'entrepreneurial skills' are, but Kelly [Head of the Enterprise Team] identified and supported the work that I was doing. By celebrating and encouraging it she gave me confidence to continue and believe that it was making positive changes. (...) I probably wouldn't have time to attend any talks or events, the seed comes from my own idea supported by the enterprise team. This, for me, is enough.”

⁹⁰ See <http://www.hud.ac.uk/schools/artdesignandarchitecture/enterpriseandengagement/studentprojects/studentname,92591,en.php>.

⁹¹ See <http://www.hud.ac.uk/schools/artdesignandarchitecture/enterpriseandengagement/studentprojects/studentname,92590,en.php>.

⁹² Quoted from <http://graduateentrepreneurship.co.uk/about/>.

As regards the issue of curricular integration, research for this case study found no tendency to move extra-curricular activities to curricular offers. Students were found to be highly motivated to spend time on extra-curricular activities when it is rewarding for themselves, their study and their career.

5.4. Institutional aspects of entrepreneurship education

5.4.1. Organisational set-up and change

Measures for coordinating and integrating EE across the university

Following his appointment as **Vice Chancellor** in 2007, Bob Cryan placed a strong emphasis on enterprise. He put in place a supportive infrastructure with the appointments of a Pro-Vice Chancellor for Research and Enterprise, a Director of Research and Enterprise, and a Head of Enterprise responsible for student and graduate enterprise and business start-up. For EE in curricula the Pro-Vice Chancellor for Teaching and Learning is in charge. The Vice-Chancellor's Office is responsible for the co-ordination and integration of university business, providing advice and support to the Vice-Chancellor on strategic, policy and management matters. The Vice-Chancellor's Office works closely with Directors from across the University. The Directors play an important role in advising the Vice-Chancellor on the management of the University in pursuing its vision, aims and objectives. The School's Deans are also actively engaged.

Kelly Smith pointed out that the Teaching and Learning Strategy 2013 – 2018 strand for "Enterprising Students" and the events and projects put in place by the university's Schools to facilitate the strand's delivery, demonstrate how the UoH combines top-down strategy and bottom-up staff experience into organisational change.

The university has an **Enterprise Team** unit that helps students and graduates actively explore self-employment and business through pre-start and early-stage trading activities. The enterprise team also plays an important role in supporting teachers from the various Schools of the UoH to developing their ability to teach about enterprise and entrepreneurship. At the end of 2014, the Enterprise Team had four core employees: the Head of Enterprise (Kelly Smith) as well as two business advisors and an office administrator.

Influence of external stakeholders in the EE programmes

Several external stakeholders have been facilitating the UoH's organisational change towards putting enterprise and entrepreneurship at the core of the university's strategy. These include for example the Duke of York, Stefan Gabriel from 3M, and business leader Theo Paphitis.

5.4.2. Laws, statutes and codes

Incentives for staff to engage in or support entrepreneurship education

As regards incentives for staff to engage in or support EE, Kelly Smith explained that the UoH's academic schools and the staff in them work towards delivery of the teaching and learning strategy. Other than this there are no incentives as such – it is just a normal part of what the UoH's teaching staff does. There are however, progression routes for enterprising staff. For example, the UoH has **Principal Enterprise Fellows** equivalent to Readers (of which Kelly Smith is one) which recognises enterprise-related expertise. There is also a professorial route for enterprise. However, teaching and learning are also recognised in this way and excellence in enterprise education can feature in both.

Incentives for other stakeholders contributing to entrepreneurship education

As regards incentives for other stakeholders contributing to EE, Kelly Smith explained that there may be some remuneration. However, most guest lecturers will not be incentivised and would probably not expect to be. Much is done on a pro bono basis.

5.4.3. Mindsets and attitudes

A commitment to develop entrepreneurial mindsets and encourage entrepreneurial behaviour can be seen in all items mentioned above. Further examples include working with a social enterprise fund for Universities – HEFCE UnLtd – to provide grants to staff, students, and graduates up to one year to encourage social enterprise start-up. Eleven grants were provided to the value of £42,000. One of the grants helped start-up Collabhub described above. A second helped seed a social enterprise support consultancy idea called CASE Futures lead by University staff, one of which has now registered for an Enterprise Doctorate to explore business models and potential spin out. In another recent initiative, a student-led “law clinic” and an events management company run by placement students took up residence in a Huddersfield shopping centre to offer their services to the community.⁹³ These endeavours led by entrepreneurial staff were supported by their academic Schools and encourage entrepreneurial thinking in the students involved.

The results of a recent survey of 100 post-graduate research students at the UoH showed that the majority of them identified with entrepreneurial attributes (Smith et al. 2013): “They were positive towards enterprise skills development with a large majority (>60%) rating it as important or very important. 65% felt that their research could have commercial impact, and 38% reported that starting up their own business appealed to them.”

Research findings suggest that there are also UoH teachers who are reserved about enterprise and entrepreneurship. However, to some extent it may rather be a matter of wording, as one interviewee said: “Some tutors are put off by the words [enterprise and entrepreneurship] as they are associated with business. Especially more traditional disciplines. Staff use all kinds of language that fosters enterprising behaviours, i.e. talks about the (..) industry, starting business, transferable skills, innovating, inventing, designing.”

5.5. Outreach to external stakeholders of EE

5.5.1. External stakeholders involved in entrepreneurship education

Enterprises

The UoH involves many external stakeholders and many different types of stakeholders into its EE. Enterprises play a particularly important role. All of the university’s study programmes are required to have industry or professional input into the approval process. In many instances this will involve small business and entrepreneurs. Several modules will include guest speakers such as entrepreneurs in lectures. Enterprises and entrepreneurs benefit for example the School of Art, Design and Architecture.⁹⁴ As another example, the UoH’s Business School has an Advisory Panel with entrepreneurial representation⁹⁵ and Partners in Law and Partners in Accountancy schemes which provides students with networking, mentoring and training opportunities via internationally renowned legal and accountancy firms.⁹⁶

The UoH has strategic alliances with 3M and Siemens. Entrepreneur Theo Paphitis, owner of the UK stationary company Ryman, has delivered master classes and has invited students to Ryman’s Head Quarters.

Financial institutions

In the field of EE, the UoH interacts with Funding Circle, a large peer-to-peer funding platform (see section 1.1.3 above).

Support services

The university has strong links with the Local Enterprise Partnership and Kirklees Council’s Economic and Creative Economy teams. It has Partners in Law and Partners in Accountancy schemes. Consultants often give their time pro bono to help support students’ business ideas. The Enterprise Team has also negotiated support, pro bono in the first instance, with specialist

⁹³ See <http://www.hud.ac.uk/uhbs/lawclinic/>.

⁹⁴ See examples at <http://www.hud.ac.uk/research/researchcentres/circ/externalrelationships/>.

⁹⁵ See <http://www.hud.ac.uk/uhbs/businessschool-about/advisoryboard/>.

⁹⁶ See for example <http://www.hud.ac.uk/uhbs/businessschool-about/partnersinlaw/>.

providers such as IP Lawyers. There are links with the local Chamber of Commerce, and support potential via the 3MBIC incubator.

Incubators, accelerators, science parks and technology parks

The UoH's campus hosts the **3M Buckley Innovation Centre**, "where global companies (...) sit alongside innovative start-ups and our best student and graduate businesses". The centre was funded with £12 million by the ERDF. The UoH considers it a "cross-sector hub for open innovation". The UoH is also a partner in a project to establish a so-called Globe Innovation Centre in West Yorkshire, linked with the 3MBIC.⁹⁷ In January 2015 the UoH was awarded funds towards another university-related incubator for advanced manufacturing and the digital and creative industries.

5.5.2. International relationships

The UoH's international relationships in EE include, for example, educator training through attendance and presentations at international conferences, being part of the Santander international network of Universities, and links with 3M as a global company supporting.

5.6. Impact and lessons learned

5.6.1. Evaluating impacts of entrepreneurship education

Overview of impact evaluation methods applied

While the UoH does not as yet systematically collect and analyse data about the impact of its entrepreneurship education, there is quantitative and qualitative data indicating such impact. Impact **indicators** relate to numbers of students supported in starting a business, numbers of students who started a business, and the survival rate of these businesses.

Statistics on students supported and on start-ups from the UoH

The UoH's submission to the UK's National Centre for Entrepreneurship in Education 2012 bi-annual mapping survey showed that over 7,000 students benefitted from curricular offers and extra-curricular enterprise activities. The university's Enterprise Team helps more than 100 students and graduates per year to explore self-employment and business through pre-start activities. Approximately 35 students and graduates per year have converted their explorations into actual start-up to date. The UoH expects this figure to increase with an increase in the numbers being supported since opening of the Duke of York Young Entrepreneur Centre in 2013. Kelly Smith said that "our Enterprise Team (...) has helped literally hundreds of new entrepreneurs start their business journey". The UoH ranks in the UK top ten for undergraduate and postgraduate employability, student placements in industry, and the number of student and graduate businesses supported. The UoH ranked 11th for graduate businesses surviving more than three years in 2012.⁹⁸ Data from the Destinations of Leavers from Higher Education (DLHE) survey in 2011/2012 and 2012/2013 showed that the vast majority of self-employed graduates remain in the North of England six months after graduation. See Annex 3 of this case study for more detailed data about start-ups and self-employment of UoH graduates.

Such impact data need however to be interpreted cautiously. In a working paper for the ISBE 2014 conference, Kelly Smith (2014) concluded on the values of UK surveys about start-ups from universities: "The overall picture is complex and issues are present in each data set that need careful consideration in order to understand what is being shown. (...) Data on HE-support student and graduate business start-up is routinely collected via surveys and reports to external funders but there is a lack of literature assessing their reliability and appropriateness for measuring impact of the HE sector on start-up, survival, and growth."

Qualitative indicators of UoH EE impact

UoH students and business support alumni have been regular winners of regional and national competitions relating to enterprise and entrepreneurship. They have been featured on television programmes including BBC 3's "Be Your Own Boss".⁹⁹

⁹⁷ See <http://www.hud.ac.uk/news/2014/january/theglobeinnovationcentregantedplanningapproval.php>.

⁹⁸ Data from University of Huddersfield (2012).

⁹⁹ Data from University of Huddersfield (2012).

Research for this case study found that the UoH's intention is to foster the emergence of small businesses, not necessarily fast-growing ones. As UoH's entrepreneurship Professor Gerard McElwee said: "There is a case to argue that there can be more value to the regional economy in creating ten small ventures than one larger SME. Multi-disciplinary approaches to supporting new venture creation has to be the way forward, whereby students and staff from differing disciplines work together to create new opportunities." Some examples of new business established by students and graduates:

- EG Visuals Ltd., an animations service provider, by recent graduates and Duke of York Young Entrepreneurs of the Year Award winners;
- Jacob Hill of the Lazy Camper, a provider of quality camping equipment, in September 2014 a BA Enterprise Development degree student;
- U-Lott, a university lottery provider, a social enterprise started by two BA Enterprise Development degree students;
- Hypersloth, a computer-animated games studio started by Enterprise Placement Year Alumni and UoH students;
- ProperMaid, an innovative baking product caterer, started by a graduate from 2008.

Impact through board memberships

UoH experts also provide high-level leadership in entrepreneurship education through sitting on boards of Enterprise Educators UK and the Institute of Small Business and Entrepreneurship as well as actively contributing to national policy including the QAA Guidelines for Enterprise and Entrepreneurship Education. UoH staff and PhD students regularly present at events and publish on enterprise education topics.¹⁰⁰

5.6.2. Lessons learned

Summary of lessons learned from this case

The UoH provides insightful experiences on many different levels, mainly in conceptualisation and organisation. All in all, five key "lessons learned" can be extracted from the case study. They explain the foundations for the UoH's approach to make every student encounter EE at some point of study and to make EE teaching "everyone's responsibility":

Conceptualisation of "entrepreneurship" as "enterprising and venturing": The UoH distinguishes between "enterprise" ("having an idea and making it happen") in the sense of behaving entrepreneurially without necessarily starting a business, and "entrepreneurship" in the sense of new venture creation, i.e. actually starting a business. This conceptualisation may help reaching students who do not seek to start a business – and teachers who do not seek to support students in starting businesses – but who may apply their enterprising thinking and behaviour for the benefit of their individual career and for the economy and society at large. For some students and teachers even the term "enterprise" may be unattractive. They may prefer terms like designing, inventing, innovating.

Ensuring sustainability of EE through support from high management: Strong leadership from the Vice Chancellor was apparently the most important reason why entrepreneurship and EE became key objectives of the UoH and were developed ever stronger in the past five years. Having established the positions of a Pro-Vice Chancellor for Research and Enterprise, a Director for Enterprise and a Head of Enterprise as well as involving the Deans helps sustain these objectives.

Enabling EE throughout the university's schools through decentralised teaching: Kelly Smith stated that "perhaps the novelty of our approach is that you can find enterprise and entrepreneurship education almost everywhere at the University of Huddersfield". The UoH seeks to ensure delivering EE throughout the university by involving teachers who are no experts in entrepreneurship. This approach can be characterised as decentralised, as opposed to a possible approach in which EE courses are offered through one central unit, which could potentially be the business school.

¹⁰⁰ Information from University of Huddersfield (2012).

Enabling non-business teachers to impart EE through a train-the-teachers concept:

The UoH enables non-business teachers to impart EE through a concept for “training the trainers”. Internally, the concept includes support from the UoH’s Enterprise Team, staff development sessions organised by the Teaching and Learning Institute, and attendance at enterprise-related sessions at the UoH’s annual Teaching and Learning Conference. Externally, support includes instructions from Enterprise Educators UK (the UK’s national network for enterprise educators) as well as attendance of EE good practice workshops and the annual International Entrepreneurship Education Conference.

Supporting enterprising students and managing EE through an “Enterprise Team”: The UoH’s Enterprise Team, an organisational unit of the UoH, plays a crucial role in supporting enterprising students as well as contributing to the development of EE across the university’s Schools.

Transferability to other universities

EE at the UoH has many characteristics that could potentially be adopted by other universities. This may apply in particular to the Enterprise Team as an organisational unit as well as decentralised EE teaching and a specific concept for teaching the teachers. The UoH does not have a very specific profile, no outstanding endowments and no very specific preconditions that would make it particularly difficult to transfer its approach elsewhere. One could assume that the UoH’s approach might work best at universities with a traditional strength in engineering and business, just as the UoH. However, the UoH is also strong at fields that are not obviously linked with enterprise and entrepreneurship but which have considerable related activities.

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Annex 1: Contents of EE degree courses

Enterprise Development BA(Hons) 2014-15

At a Glance

UCAS code: N190

Start date: 22 / 09 / 2014

Duration: 3 years full-time

Places Available: 30 (this number may be subject to change)

Course Type: Full Time

Entry Requirements: Minimum entry requirements include one of the following:

- BBB at A Level
- From DMM-DDM in National Diploma
- 300 UCAS tariff points

We welcome students of any age and will consider each applicant, via interview, on the strength of their motivation and suitability for the course. Entrants to the course would be expected to demonstrate the following personal qualities: self assurance and self confidence; motivation to do something on their own; a willingness to accept responsibility for their own decisions and actions; in possession of drive and a determination to succeed; comfortable with setbacks.

The course

This distinctive and original course has been designed to help young entrepreneurs start and run their own business whilst studying for a degree. Dragons' Den panellist and self-made retail millionaire Theo Paphitis has given his support and backing for this pioneering degree at Huddersfield. Over the three years of the course you'll have the benefit of access to several successful entrepreneurs, including Theo, who has agreed to mentor students with his very own 'Masterclass'. In a managed risk environment you'll screen opportunities to find one with real potential, plan the business, launch it and grow it. We develop the idea, the person and the business so you can graduate with both a degree and a viable business. You'll receive guidance and mentoring from our own Enterprise Team business incubation service and from external professionals, as well as help in finding the necessary funding to get your business off the ground.

Course content

On this course you'll start your own business while you study the necessary business disciplines. You will focus initially on the process of identifying and screening a number of ideas, homing in on one that is viable. Once you've decided on your business opportunity, you'll develop your plan and start your enterprise. Finally, you'll operate your business in the final year and gain credits from this experiential learning. We maintain links with a wide range of successful businesses and organisations. We encourage you to network with successful role model entrepreneurs, professional experts and external mentors as well as our Business School and Enterprise Team staff. Most types of business are relevant and possible and there is some opportunity to study more technical support modules from across the University.

Year 1

- Marketing Analysis
- Enterprise Development 1: Developing The Entrepreneur
- The Legal Environment of Business and Employment
- Accounting for Managers (Foundation)
- Creativity and Innovation for Business

Year 2

- Small Business Enterprise and Planning
- Management and Research Methods
- Enterprise Development II - Developing the Business Plan

Plus one option choice of either:

- Customer Insight

or

- Market Research and Consultancy

or these three modules:

- Marketing Communications
- The Customer Experience
- Introduction to Operations Management

Year 3

- Business and the Entrepreneur
- Enterprise Development III - Developing the Business
- Enterprise Development Dissertation

Teaching and assessment

You'll learn through lectures, seminars and tutorials, with a strong focus on practical work. Our varied assessment methods, which include assignments, exams and individual project work, are focused upon the development of transferable skills which will provide immediate benefit in your future career.

Facilities

The Business School was opened in 2010 at a cost of £17m and is the most eco-friendly building on campus. It's a state-of-the art facility and provides you with a modern, professional environment in which to learn and develop. Located right next to the Huddersfield Narrow Canal it's in a leafy and picturesque location at the heart of the campus.

Our students can take advantage of start-up facilities and business support in the Centre for Young Entrepreneurs. The Centre is located in the University's new £12 million 3M Buckley Innovation Centre which was opened by HRH The Duke of York in May 2013.

(Source: <http://www.hud.ac.uk/courses/2014-15/full-time/undergraduate/enterprise-development-ba-hons/>, last accessed 15/5/2014)

Master of Enterprise

The Masters of Enterprise (MEnt) programme allows you to undertake a one year (full time) or two year (part time) research degree. It contains little or no formal taught component. Such programmes are attractive to those wanting a briefer research degree than a PhD. It is ideal for individuals wishing to explore a potential business or social enterprise idea, either to start-up their own business or for a new venture within public- or private-sector organisations. The emphasis will be on enterprise creation and personal entrepreneurial development within the chosen area, rather than on the study of business organisations. On graduation, you will have acquired entrepreneurial knowledge, behaviours, and skills with the ability to use research to develop and underpin your ideas. Depending on your research project, you will be in a position to take a new service or product to market; increase your likelihood of success in business, social enterprise, or self-employment; and have a better understanding of issues impacting on enterprise activity related to your area of research.

The Research Programme

The programme of research normally involves a literature study, followed by the critical and reflective development of an evidence-supported business plan. The supporting evidence might include market research; empirical testing of materials, methods, or procedure; or full discussion of appropriate academic literature. A short version of the business plan should be provided in an appendix to your research thesis. You are expected to work to an approved programme of work including appropriate programmes of postgraduate study (which may be drawn from parts of existing postgraduate courses, final year degree programmes, conferences, guided reading or a combination of study methods). The programme of research is assisted by these background and related studies which can be especially important if you are a part-time/mature student who may have been away from formal studying for some time.

Supervision

You will have a minimum of one main supervisor who will normally be part of a supervisory team, comprising of up to three members. At least one member of the supervisory team will have a successful track record of supervision at the appropriate level, and at least one member of the supervisory team will be currently engaged in research in the relevant discipline(s) so as to ensure that the direction and monitoring of the student's progress is informed by up to date subject knowledge and research developments. They will be supported by an enterprise adviser, normally based in the University, although an external adviser may also be considered depending on individual project requirements. The research supervisor(s) will work with the student to select taught modules appropriate to their research project, and provide subject-specific guidance; the enterprise advisor will provide advice on issues such as business or social enterprise start-up, self-employment, or knowledge transfer.

Assessment

Examination for a Masters by Research is by thesis. The text of the thesis should not normally exceed 25,000 words. Where the submission is accompanied by material in other than written form or the research involves creative writing or the preparation of a scholarly edition, the written commentary should normally be a minimum of 5,000 words.

(Source:

<http://www.hud.ac.uk/researchdegrees/typesofresearchdegrees/masters/masterofenterprise/>,
last accessed 15/5/2014)

Annex 2: Description of an exemplary credit-bearing course outside the Business School

Enhancing employability: good practice in enterprise education

Name: Caroline Pringle

Role: Senior Lecturer Digital and Practical Journalism

Institution: University of Huddersfield

Activity/practice: what it is and why it is innovative and/or offers something different;

Magazine Design and Production “analyses the diversity and complexity of the magazine market and considers the nature of design and production. The economics, costs, techniques, and organisation of design and production are examined and the nature of the publishing industry investigated. The module also looks at the market for new magazines, and investigates how editors and publishers identify and develop new opportunities.”

This module, delivered to Journalism students (and offered to Business with Design students), offers a holistic view of the Magazine industry and production process; it allows students to see through a project from conception idea for a magazine, to the production of a dummy copy, via market research, budgeting, design iteration and marketing. All of this is then presented to a Dragon’s Den style panel of Industry professionals that the staff group have built up over the years.

The delivery of the module is fairly traditional in the first term laying the ground work of knowledge and learning, via lectures (including visiting practitioners), seminars and practical design workshops.

In the second term students work in groups as a business team, taking on responsibility for design, editorial, business and finance. They are provided with a production schedule and all sign a contract agreement. We hold drop-in production workshops instead of traditional classes, this is to encourage a production environment and encourage informal peer collaboration and assessment.

These session runs throughout Friday afternoon and must include a production meeting with a tutor. Production meetings include feedback and directed learning, adhering as closely as possible to the production schedule. It also allows us, the tutors, to ensure work is progressing at a good rate for completion.

While each student takes ultimate responsibility for an area of the project, the aim is that they then delegate tasks to group members, ensuring all students tackle a range of tasks and skill sets. This includes writing copy, market research, page design, sourcing and contacting relevant advertisers and building a web/digital strategy.

The culmination of the project is a 12 page dummy copy of the magazine with representative copy, design and advertising; a portfolio of evidence that this is a viable magazine product, including market research, media pack, style guide and design analysis, web strategy, basic balance sheet and basic business plan; this is all presented to the panel of industry professionals and tutors.

The presentation is treated professionally and the panel ask challenging and pertinent questions. While their role is not to mark students, they add a real world angle to this assessment. Practitioners range from magazine and newspaper editors, to print and digital media designers to online marketing strategists working in the publishing industry.

How students are engaged; students become very invested in this project, often producing above and beyond what is expected.

The weekly meetings with tutors and the production schedule serve to break down a large and potentially unwieldy project in to reasonable and achievable targets, these are skills that are incredibly important in enterprise and in honours level modules and beyond.

The production afternoons provide a flexible frame work for students to work in and are incredibly productive and positive working environments, ensuring that groups and students remain motivated and engaged.

Outcomes and evidence of impact: General outcomes are that students can see the whole process of production, putting the journalism writing and content production in context. The project also encourages the embedding of skills from outside the module, post pertinently at the moment web skills in implementing web strategies, and while this is addressed in teaching, students regularly bring their own skills and knowledge to the project.

Every year at least one of these projects will be taken further, into further education based projects or on to actual publications, this year a group took elements of their magazine idea and approached one of their advertisers with a magazine proposal, they went on to produce two 30 page digital magazines for this external client as part of an honours level module. The success of this has led to the client commissioning regular publications.

The panel that attend as Dragon's are regularly very impressed with the standard of work this module produces and this has led to a range of work experience places, for final year students, these include Press Association, Excelle Magazine and Barnsley Chronicle.

Magazine Design and Production

Intermediate Level

Core for:

BA(Hons) Journalism

Optional on:

BA(Hons) Music Journalism

BA(Hons) Sports Journalism

BA Hons Business with Design

Annex 3: Statistics about start-ups from the UoH

The UK’s Higher Education – Business and Community Interaction (HE-BCI) survey shows data for start-ups from universities. In terms of the wider university provision, the UoH’s HE-BCI data for graduate start-ups (up to two years from graduation) and three-year survival rates are provided below. The UoH only counts a graduate start-up if it has received dedicated start-up support, which means that the actual number may be higher. The numbers nominally dropped in 2011 – 2012 due to a change in reporting requirements that required universities to have evidence of business registration. Before 2010/2011, the UoH was ranked in the top ten or eleven of UK universities.

Destinations of leavers from higher education provide self-reported data on self-employment and exploration of business start-up six months after graduation. The UoH rates of self-employment and business start-up are above national average. A new DHLE question was included in 2011/2012 onwards, asking how well prepared the graduates’ universities prepared them for self-employment and freelancing. 40% of 3,660 graduates responded that the university prepared them “well” or “very well”.

Year Survey / Indicator	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012	2012/ 2013
HE-BCI					
Number of graduate start-ups created	33	45	39	20	21
Number of graduate start-ups still active which have survived at least three years	51	61	77	51	58
DHLE					
Self-Employment	70	129	165	161	179
Business Start-Up				24	35
Well or very well prepared for self-employment / freelancing				39%	40%

The DLHE data also shows that the vast majority of self-employed graduates remain in the North of England six months after graduation. 66% are based in Yorkshire and the Humber with the majority of these in West Yorkshire in which Huddersfield is located (49% of all self-employed individuals). Only 3% are based in Greater London. A proportion of these businesses are likely to have been supported by the Yorkshire and Humber ERDF-funded Graduate Entrepreneurship Project that was specifically designed to help graduates start-up and remain in the region.

The mean salary for self-employed graduates who provided information was £23,000 in 2011/2012 and £23,900 in 2012/2013. These numbers are comparable or higher with the whole survey population that reported mean salaries of £23,300 and £21,800 respectively. Although a large number of self-employed individuals were not drawing a salary six months after graduation, four reported that they provided themselves with a salary of over £50,000 in each of the two years for which this data has been recorded.

The UoH’s Enterprise Team data showed that 52 students and graduates signed up for business start-up support in 2012/2013, 37 of who were pre-trading and 15 trading. The Enterprise Team dealt with 281 general enquiries, held 450 one-to-one business advice meetings, and delivered 14 events with over 400 attendees in total. Over 80 students and graduates are currently signed up for Enterprise Support and access to the Duke of York Young Entrepreneur Centre.

6. Kaunas University of Technology, Lithuania: Developing entrepreneurship education with international expert networks

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Abstract



Kaunas University of Technology (KTU), Lithuania, is one of the leading universities in the country. Initiatives to develop entrepreneurship education (EE) at KTU began in 2011. They were driven by the Vice-Rector for Research, professors from the School of Economics and Business, the Innovation and Entrepreneurship Centre, and a business leader. KTU offers two regular EE courses: Technology Entrepreneurship, an elective course for undergraduate students, and Technology Venturing for graduate students. Both target students from KTU's engineering schools. There are also recurrent extra-curricular activities like an accelerator programme named "Start-up Sauna" and start-up weekends. KTU also supports students in participating in a business plan competition at San José State University (SJU), US. KTU seeks to extend EE offers, curricular as well as extra-curricular. A barrier to extend EE offers at KTU appears to be that it is not considered as a "hard science" by some in the engineering schools. Furthermore, there is competition about credit-bearing courses and about resources. A striking characteristic is that KTU develops EE with comprehensive and targeted support from experts from abroad. Main supporters include Aalto University, Finland, and the US universities of Stanford and Berkeley. KTU considers these universities as world-leading examples of EE at engineering schools. There was also notable support from the US Market Access Centre. Limitations of involving external experts in developing EE were found to be related to funds, time, a necessity to have own experience in entrepreneurship, and a need for adapting foreign approaches to local socio-economic conditions. KTU's approach may be insightful particularly for other technical universities.

Case study fact sheet

▪ Full name of the university, location:	<i>Kaunas University of Technology, Kaunas, Lithuania</i>
▪ Legal status:	<i>Public</i>
▪ Campuses:	<i>Kaunas</i>
▪ Year of foundation:	<i>1922</i>
▪ Number of students:	<i>Approximately 11,000 (http://ktu.edu/en/content/facts-and-figures)</i>
▪ Number of employees:	<i>Approximately 1,000 academic employees (http://ktu.edu/en/content/facts-and-figures)</i>
▪ Budget in most recent financial year:	<i>Not available</i>
▪ Academic profile:	<i>Nine faculties: Chemical Technology, Electrical and Electronics Engineering, Informatics, Mathematics and Natural Sciences, Mechanical Engineering and Design, Social Sciences, Arts and Humanities, Civil Engineering and Architecture, School of Economics and Business, and Panevėžys Faculty of Technologies and Business. Nine research institutes.</i>
▪ Entrepreneurship education (EE) profile:	<i>Recent introduction of entrepreneurship education (first course in 2013) and ambitions to broaden and deepen EE, supported by the recently founded Innovation and Entrepreneurship Centre.</i>
▪ Activities focused in this case study:	<i>Developing EE with support from renowned international experts</i>
▪ Case gatekeeper:	<i>Violeta Kaunelienė, Head of Intellectual Property Management Group, National Innovation and Entrepreneurship Centre, Kaunas University of</i>

<i>Technology</i>

The status of information provided in this case study is February 2015 unless stated differently.

6.1. The university’s entrepreneurial profile

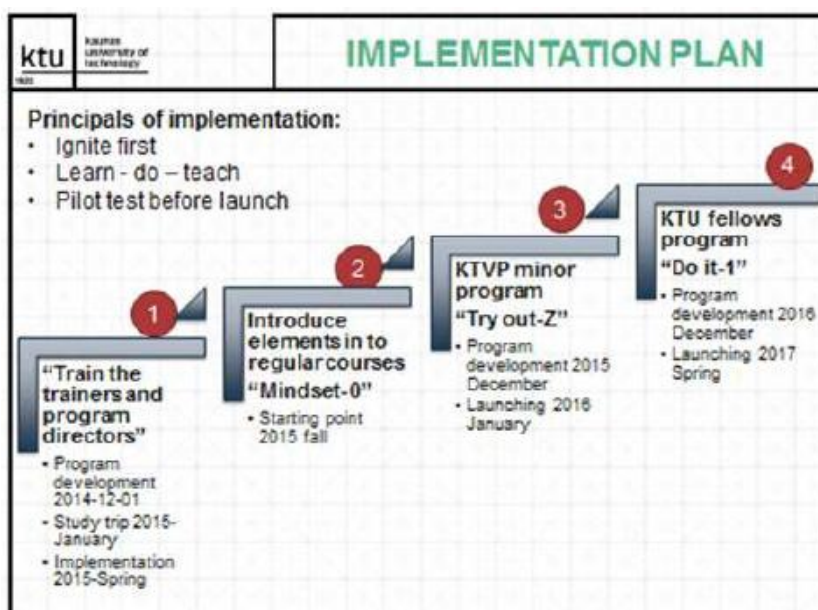
6.1.1. The university’s overall approach to entrepreneurship education

Kaunas University of Technology (KTU), located in the second-largest city of Lithuania, is one of the leading universities in the country. Entrepreneurship education (EE) is a fairly recent item on KTU’s agenda. Initiatives to develop EE began in 2011. Since early 2015, there are two regular EE courses: Technology Entrepreneurship and Technology Venturing. KTU seeks to extend EE offers and the number of students involved in these offers.

KTU did not start EE from zero – there was some entrepreneurial understanding among teachers and management. It was also a favourable precondition that KTU has a Business School and that this Business School had been working with the engineering faculties. The missing factor was networks, and in particular international networks. KTU has been developing EE with considerable support from renowned international experts. Experts are mainly from Aalto University (Finland), Stanford University and University of California, Berkeley (US), as well as the US Market Access Centre (US MAC). This support is a main theme on which this case study focuses. This case study seeks to describe and analyse EE courses and the international support with which they are developed, deriving lessons from which other universities may learn when trying to go a similar road.

KTU has an implementation plan for EE that foresees four steps, as depicted in Exhibit 5-1: First, to train the trainers and programme directors by spring 2015. Second, to introduce entrepreneurship elements into regular courses starting in autumn 2015. Third, launching a programme of the Kaunas Technology Venture Programme minor in January 2016. Fourth, implementing a KTU fellow programme in spring 2017.

Exhibit 6-1: EE implementation plan at Kaunas University of Technology



Source: KTU

Developing EE is part of an overall ambition to create an entrepreneurial environment at KTU. This also includes an appreciation of intrapreneurship.

6.1.2. Leadership and governance

Importance of governmental activities for developing EE

At the time of writing this case study and in the years before, there were no specific governmental strategies and programmes supporting the development of EE in Lithuania. There were only more general policies for supporting start-ups. However, according to interviews for

this case study, launching entrepreneurship education and related organisations at KTU was also fostered by the Lithuanian Government. A key promoter was found to be Alex Sozonoff¹⁰¹, who was Vice-President and Senior Adviser to the CEO of the Hewlett Packard Company (HP) for many years and who worked with HP Lithuania and Lithuanian Government departments. He is member of the Lithuanian Investment Advisory Council. In order to further develop the Lithuanian economy, his recommendation the Lithuanian Minister for the Economy was to establish an academic programme around entrepreneurship and innovation. In the end, KTU was selected for such a programme because it appeared to be the most dynamic university in the country and had already initiatives in place for introducing entrepreneurship

Importance of entrepreneurship in the University's strategy

The KTU's strategy paper from 2012 (KTU 2012) does not directly mention entrepreneurship or even entrepreneurship education. However, the paper targets better links with businesses – more co-operation, more joint R&D – and it mentions knowledge transfer several times. This points indirectly to the importance which the university attributes to entrepreneurship. The same applies to the University's strategic plan for 2014 – 2016 (KTU 2014b), which in addition specifies the commercialisation of intellectual property as an objective.

Extent of top management commitment to implementing entrepreneurship

KTU began developing EE in 2011 when the new Rectorate came into office. Besides the initiative taken by businessman and entrepreneur Alex Sozonoff and the Lithuanian Ministry for the Economy, there was apparently no specific driver behind the idea to foster EE at KTU. It was just believed to be the right thing to do.

Four promoters were found to be particularly important for driving the development of entrepreneurship education at KTU: the Vice Rector for Research (Asta Pundzienė), the Dean of the Faculty of Economics and Business (Prof. Dr. Edita Gimžauskienė), the then Head of the Intellectual Property Management Group of the National Innovation and Entrepreneurship Centre (NIEC) (Dr. Violeta Kaunelienė), and the Head of the Department of Strategic Management, School of Economics and Business (Prof. Dr. Monika Petraitė). Hence, KTU is also an example of women driving entrepreneurship education.

Students were not found to be demanding or promoting EE, except some specifically interested individuals. On the contrary, it may take five to ten years to make the bulk of students know what entrepreneurship is about, as Asta Pundzienė said.

The case study also identified **barriers to developing EE**, including issues related to organisational culture, decreasing number of students, budgeting incentives, and administrative requirements:

- Two interviewees stated that the “organisational culture” is an impediment: There are people who are sceptical about EE, particularly in engineering schools, arguing that KTU should rather concentrate on “hard matters” and that EE is “not serious”, only providing “soft skills” like finance and marketing. One of the interviewees said there is some, but not necessarily strong, resistance.
- A further barrier to developing EE at KTU was found to be that the number of students is decreasing for demographical reasons. One of the interviewees elaborated that when the number of students decreases, there is also pressure to reduce the number of staff. In such a situation it is difficult to introduce new courses because it implies discontinuing other courses and possibly dismissing employees.
- Another issue may be that a Faculty's budget depends on the number of modules offered; hence it is not attractive for an engineering faculty to take over an EE module from the Business School. (See also section 6.4.2 about laws, statutes and codes.)
- One of the external advisors said that KTU, as a public university, needs to incorporate “a lot of red tape” for administration and fulfil governmental requirements, for example with regard to taking a certain number of students into classes.

Level of Schools' and departments' autonomy to act

¹⁰¹ See <http://en.ktu.lt/content/news/alex-sozonoff-young-people-today-leaders-tomorrow-are-facing-continuously-changing-world> for further information about Alex Sozonoff.

While KTU's faculties can in principle, introduce as many courses as they want, proposed new courses need to fit with existing programmes and the overall budget. Study programme committees need to approve new courses. This may not necessarily be in the interest of the faculties concerned. In the case of the Technology Venturing course described further below, the programme committee did not include it in the study programme as compulsory course. Engineering faculties were required to replace an engineering course with the Technology Venturing course, which they did not want.

Organisational implementation

At the time of writing this case study, Violeta Kauneliene from the National Innovation and Entrepreneurship Centre (NIEC), which also acts as the KTU's technology transfer office, was the overall co-ordinator of EE-related activities. She believed that more people needed to be involved in EE so these offers could be extended. It should be noted that while Violeta Kauneliene was working for the NIEC and delivered lectures about intellectual property management to participants of the EE courses, the NIEC was involved in EE only in terms of co-ordination and organisation, and not in terms of content. The EE courses and their contents were co-ordinated by Monika Petraite from the Business School's Department of Strategic Management.

University's importance for driving entrepreneurship in its environment

KTU is an important actor in driving entrepreneurship in the Kaunas region and also in Lithuania at large. The University pays strong attention to "synergy with business, entrepreneurship, and practical skills", as mentioned in the University's profile overview for 2014 (KTU 2014). The profile mentions five items in this respect:

- (1) KTU's "Start-up Space", an NIEC unit that fosters young businesses.
- (2) KTU's contribution "to solving real problems" through carrying out 70% of all research and development (R&D) which Lithuanian universities provide for private business.
- (3) Two integrated "science, study, and business valleys", Santaka and Nemunas, founded by KTU to provide open-access laboratory space for collaboration among students, researchers, and business representatives to create innovations.
- (4) Technology transfer facilitated by the National Innovation and Entrepreneurship Centre, a "single window" for communication between research, business, and industry.
- (5) A specialised Technology Entrepreneurship module in the KTU's curricula.

6.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

The teachers running KTU's EE courses are employees of the University. External guest speakers, for example entrepreneurs, are invited occasionally to present on specific issues. One of the interviewees said that there is as yet, no sufficiently large pool of supporters and teachers who can instruct and train about entrepreneurship on campus, which is an impediment for further developing EE. Those who drive EE are working on this issue.

Financial resources for entrepreneurship education

EE funding was found to be not particularly strong and persistent. EE and its development are funded through the University and through European projects. The University teachers involved in EE are employees of the University and thus paid by the University. KTU also has a budget for hiring external lecturers for specific purposes. Furthermore, KTU has been running European projects related to entrepreneurship and technology transfer, for example, a project for building technology transfer capacity and a project for mentoring founders and supporting start-ups. Such funding also indirectly helps to develop EE.

6.2. Entrepreneurship in curricula and teaching

6.2.1. Overview about curricular offers

There are two curricular offers in entrepreneurship education at KTU: a course in “Technology Entrepreneurship” and one in “Technology Venturing”. Both are elective, not compulsory; both are for Bachelor students in engineering; “Technology Entrepreneurship” is for undergraduates while “Technology Venturing” is for graduate students. Exhibit

KTU’s principal aim at the time of writing this case study is maintaining these two courses. There are also plans to introduce a course for advanced students as well as a programme at the PhD level. Furthermore, the Business School would like to expand the entrepreneurship subject into existing courses about innovation, as well as to introduce more specific entrepreneurship courses, for example, on entrepreneurial marketing and finance.

Exhibit 6-2: Overview of curricular EE offers at Kaunas University of Technology

No.	Name	Objectives	Target group	Offered since [year]	No. of participants in [year]
1	Technology Entrepreneurship	“Provide basic entrepreneurial skills, based on the interaction of technology and knowledge transfer as well as entrepreneurial skills for start-up development.” (Course description)	Elective course for Bachelor-level students	2013	65 (2014)
2	Technology Venturing	“Provide business and venturing competences for transferring technology concept into the business model, venture capital attraction and shape entrepreneurial behaviour as a professional feature.” (Course description)	Elective course for Master-level engineering students	Spring 2014	40 (2014)

Technology Entrepreneurship

KTU offered the course “Technology Entrepreneurship” for the first time in September 2013. The course targets engineering students and is supposed to teach about basic elements of entrepreneurship, involving as many practitioners as possible. According to the course summary, “the course aims to introduce fundamentals of technology and R&D driven entrepreneurship, and provide basic knowledge on the processes used by technology entrepreneurs to start companies. It develops basic skills of taking a technological idea and finding a high-potential commercial opportunity, gathering resources such as talent and capital, figuring out how to sell and market the idea, and managing rapid growth of an enterprise.” For engineering students, it is an elective course.

Source: KTU. See Annex 1 for a detailed description.

Technology Venturing

The course “Technology Venturing” was run at KTU for the first time in spring 2014. According to the description, the course provides “business and venturing competences for transferring technology concept[s]” into a viable business model, for attracting venture capital and shaping entrepreneurial behaviour. Attendees learn about early-stage entrepreneurship including, for example, technology business opportunity assessment, business and product development, and entrepreneurial marketing.

Source: KTU. See Annex 2 for a detailed description.

6.2.2. Target groups

Main target groups of entrepreneurship education

Before implanting the two courses there were already elements of EE included in Bachelor education at KTU's School of Economics and Business. KTU's new approach was to implement an EE concept in engineering education. At first, only a small amount of business students – up to one sixth of the group – was allowed to attend the courses. In 2014, there were no such limitations any more. The Technology Entrepreneurship course can be attended by a maximum of 200 students; Technology Venturing is limited to 40 students. Engineering students attending the courses came from six of KTU's nine faculties: Mechanical Engineering and Design, Informatics, Electrical and Electronics Engineering, Civil Engineering and Architecture, Chemical Technology, and Social Sciences, Arts and Humanities. According to KTU, this composition of faculties was also reflected in the student teams within the courses – which is what the KTU aimed at. In 2014, spaces in the courses were allocated on a first come – first serve basis, but the university sought to establish some kind of competition.

Students in the Technology Entrepreneurship course were reported to have different levels of excitement regarding entrepreneurship. Monika Petraité said that 75% of the participants in the Technology Entrepreneurship course would choose it again; for the other 25%, the course was too challenging. The aim was to confront first-year students with the idea of entrepreneurship, however, for some “freshers” it may have been too demanding. One of the students interviewed for this case study said “it was the best course I had”.

Continuous education

At the time of authoring this case study, KTU did not offer continuous education in entrepreneurship.

Bridges to secondary education

In early 2015, KTU introduced a new scheme bridging secondary and tertiary education in the field of entrepreneurship: High school students could attend a competitive course from which the most successful students were offered a space in the Technological Entrepreneurship course for autumn 2015.

6.2.3. Designing lectures and courses – basic curricular decisions

Objectives

The objective of the two EE courses at KTU is to confront students very practically with entrepreneurial activity and attitude. The overall objective of the **Technology Entrepreneurship** course is, as one of the KTU representatives said, “To plant a seed, to show that there is a different career path”.

The **Technology Venturing** course is, according to the syllabus, “an experiential course that aims to ‘throw student teams into the deep end’ of entrepreneurship” (p. 1).

Contents

The **Technology Entrepreneurship** course has three main themes: (1) “inspiration”, including issues such as “the essence of technology driven entrepreneurship”, “entrepreneurial leadership in technology venturing”, and business models; (2) “creativity sources and improvisation in technology business”, including “creativity and creativity methods in technology venturing” as well as “entrepreneurial team formation and teamwork”; and (3) “technology business design”, including the lean start-up methodology, business model design, validation of the business model, sources for financing of technological business, intellectual property issues in technology entrepreneurship, and business model pitch for stakeholders.

The sessions in the **Technology Venturing** course are organised around nine building blocks of a business model, related to the business model canvas concept:¹⁰² key partners, key activities,

¹⁰² See <http://businessmodelgeneration.com/canvas/bmc>.

key resources, value propositions, customer relationships, channels, customer segments, cost structure, and revenue streams.

Methods

Technology Entrepreneurship

The Technology Entrepreneurship course is a series of lectures – formal ones and guest lectures – plus interactive methods such as discussions, role plays, reflective journals, and case lectures. As noted in an academic article about KTU's EE approach, "teachers try to create interactive emotional experience based lectures, thought-provoking sessions where students are engaged into the experiential learning and learning-by-doing and feel motivated for learning on their own".¹⁰³ One of the KTU representatives said that some students find it difficult to accept the non-traditional methods applied, noting that "the methods originated in the US entrepreneurial ecosystem, and we are trying to make them more compatible with the mindsets of our – Eastern European – students".

Technology Venturing

The Technology Venturing course rests upon the "**lean launchpad**" approach from Stanford University. The lean launchpad implies "a heavily hands-on programme that immerses teams in developing, testing, and iterating their business model hypotheses outside the classroom" (p. 1). It prefers interaction between students, as well as the teaching and coaching team, over traditional lectures. The approach adopts the "**flipped classroom**" concept, meaning that traditional lecture content is assigned as homework and class time is spent interacting with professionals and practitioners.

The lean launchpad syllabus describes the courses' methods as follows: "During each class, all teams present their 'lessons learned' from their customer discovery efforts outside the classroom and explain how their business model has iterated or pivoted as a result. All teams are expected to be fully autonomous in conducting assignments, customer discovery efforts outside the classroom, and adequately preparing for and delivering presentations at each session. (...) This is an advanced class in entrepreneurship, so the teaching team and coaches will be highly demanding."

At KTU, Aalto advisors introduced concepts that were meant to be adapted to the Lithuanian environment. For example, the original lean launchpad approach from Stanford University provides for a ten-week bootcamp where students are pushed beyond their limits by making them believe their efforts are insufficient, until they are told in the final debriefing that they are fantastic. Instead, Aalto proposed a motivational, inspirational approach.

In order to ensure that course time is effectively used for practical work, students are required to read or view all material before coming to class. All material is provided electronically in advance of the sessions.¹⁰⁴

For searching information about the students' targeted market and companies within it, as well as customers, students' are required to access numerous **databases** such as Edgar (US Securities Exchange Commission)¹⁰⁵, Library online resources¹⁰⁶, Orbis¹⁰⁷, Hoover's Lexis Nexis¹⁰⁸, Financial Times¹⁰⁹ and others.

Preparing students for taking part in the San José State University business competition in the US is part of the course.

Media

The two entrepreneurship courses make intensive use of online media. Study books and other material are available online, teachers communicate with students via a Moodle¹¹⁰ learning platform, and there is a related Facebook site.

¹⁰³ Bakanovė/ Petraitė/Urbonė.

¹⁰⁴ Lean launchpad syllabus, p. 1.

¹⁰⁵ See <http://www.sec.gov/edgar/searchedgar/webusers.htm>.

¹⁰⁶ See <http://lib.hse.fi/EN/ecampus>.

¹⁰⁷ See <https://orbis.bvdinfo.com>.

¹⁰⁸ See <http://www.lexisnexis.com/hottopics/lnacademic>.

¹⁰⁹ See <http://www.ft.com/home/europe>.

¹¹⁰ Moodle is an open source learning platform, see <http://moodle.org>.

The **Technology Entrepreneurship** course uses a “Reflective Journal” as a means of triggering students’ self-reflection with online media. The Reflective Journal is an online blog where every student of the course has to enter his or her experiences in the course into a log site for each session. The entries can be in text format but also pictures or videos. Teachers read the entries and may react upon what is written there. Second, students have to group into teams and each team needs to comment regularly in a student blog.¹¹¹

The “lean launchpad” approach of the **Technology Venturing** course uses, beside normal textbooks and articles, two specific online media: Udacity.com, a for-profit education service provider offering an “online university”, and Lean Launch Lab¹¹², offering an online workspace that is essential to collect material from students participating in the course.

Informal evaluation of learning outcomes and feedback for students

All evaluation of the courses is based on students’ experience because the course itself is experience-based. Students have to present their business ideas and receive feedback for their pitches from course staff, mentors and guest speakers; and the student teams also evaluate themselves. This is an unusual way of evaluation, which may be challenging for students because they cannot escape the experiential approach.

Formal evaluation of learning outcomes

The **Technology Entrepreneurship** course has a brief final exam in which students have to reflect on what they learned and how the course could be improved. Students receive their marks for outputs such as their blog entries and teamwork.

In the **Technology Venturing** course, students receive feedback from mentors and coaches on the presentations they deliver. Course staff evaluates what students learned about the tools and methods, for example, who the customers are. There is no evaluation of the success of the business idea. According to the “lean launchpad” syllabus, “there are no numerical grades assigned for any of the assignments or presentations. All assignments and presentations are evaluated as either passed or failed. The overall class is graded as Pass/Fail.”

6.2.4. Setting of entrepreneurship teaching

Locations

The lectures of the EE courses take place in conventional lecture halls. For the practical parts there is a large, flat room in the same building where teams can go to corners and staff can walk around and discuss with them. The first edition of the Technology Entrepreneurship course took place in KTU’s E-Learning Centre in order to record the lectures.

Timing

Technological Entrepreneurship runs throughout a semester, comprising 160 teaching hours. Theoretical classes take place every week in three-hour blocks; practical classes every other week for one and a half hour.

Technological Entrepreneurship is a four-day block course offered in spring and autumn. One of the annual courses is in English, the other in Lithuanian. Originally it was a six-week course, using the “lean launchpad” approach applied at Aalto University.

6.2.5. Instructors: teachers and mentors

Professors, other employees and external lecturers of the university

The **Technology Entrepreneurship** course is organised exclusively by KTU staff, but there are also guest lectures from entrepreneurs and other business professionals. The following KTU staff members are involved as teachers and mentors:

- Prof. Monika Petraité (course leader), Head of the Department of Strategic Management, School of Economics and Business.

¹¹¹ See <http://www.goodidea-ktu.blogspot.com>.

¹¹² See <http://www.leanlaunchlab.com>.

- Prof. Eduardas Bareiša, Dean of the Faculty of Informatics.
- Prof. Algimantas Valinevičius, Dean of the Faculty of Electrical and Electronics Engineering.
- Dr. Andrius Vilkauskas, Dean of the Faculty of Mechanical Engineering and Design.
- Prof. Rytis Krušinskas, Head of Department of Finance, School of Economics and Business.
- Assoc. Prof. Dainius Martuzevičius, Vice Dean for Research, Faculty of Chemical Technology.

The larger number of people involved indicates that Technology Entrepreneurship is a staff-intensive course.

The course **Technology Venturing** is organised by the following experts, also including experts from abroad:

- Prof. Dr. Monika Petraitė: co-ordinator, start-up mentor, STVP faculty fellow, Entrepreneurship lecturer at KTU, EU and Lithuanian expert of innovation politics and practice.
- Dr. Fabian Sepulveda: start-up mentor, Lean Launchpad trainer, Entrepreneurship lecturer at Aalto University and a co-founder and CEO of EyEscubed.
- Dr. Renata Urbonė: start-up mentor, Lean Launchpad Fellow, Entrepreneurship lecturer at KTU, project management practitioner.
- Dr. Agnė Bakanovė: start-up mentor, STVP faculty fellow, lecturer and Technology Venturing course coordinator at KTU, manager of the entrepreneurship project "Inostartas".

Business professionals, often top managers from well-established companies, also regularly give lectures to KTU students. They speak about specific subjects, such as entrepreneurial finance. They normally do not extensively present and elaborate on business cases.

"Real entrepreneurs" as teachers

Some of the teachers are "real" entrepreneurs. For example, Dr. Fabian Sepulveda, co-organiser of the "Technology Venturing" course, is a co-founder and CEO of the EyEscubed company (<http://eyescubed.com/>).

Mentors

The KTU staff members running the course Technology Entrepreneurship also act as mentors for students. Students can ask any mentor for advice, depending on the issue that needs to be clarified.

In the Technology Venturing course, each start-up team in the entrepreneurship courses is assigned a mentor. According to the lean launchpad syllabus, "mentors are external volunteers who are entrepreneurs, venture capitalists, business angels, etc. (...). Please be respectful of their time and use it wisely. You will also have access to alternating coaches during each of the sessions." The organisers of the Technology Venturing course also act as start-up mentors. Mentoring takes place on a volunteer basis.

6.2.6. Management of entrepreneurship education

Teacher management

There are as yet no specific teacher and trainer management facilities at KTU. "Teaching the teachers" takes place by way of being consulted by foreign experts (see section 6.5 for details). Four people in charge of EE attended a two-week seminar of the Stanford Technology Ventures Programme (SVTP) in August 2014. In 2014 there was no network of EE teachers in Lithuania yet, although there were some EE teachers at other Lithuanian universities.

Managing student support

Support to students interested in a start-up company or actually starting a company was found to be managed by the National Innovation and Entrepreneurship Centre at KTU.

Internal and external network management

Management of internal and external networks for entrepreneurship education is mainly done by Monika Petraité from the Department of Strategic Management.

Management of curricular integration and attracting students

The EE course teachers and the EE co-ordinator at the NIEC have been working closely with the Deans of the engineering faculties in order to “market” the courses, make Deans support the offers, and attract students.

Evaluation of courses

KTU is in a process of discussing the courses on offer and developing them further, involving teachers, deans, top management and external experts. Thus, there is intense evaluation of the EE courses.

Managing entrepreneurship education finance

Funding the entrepreneurship courses is an issue because they are personnel-intensive. Moreover, taking students to the San José State University’s business plan competition, which is part of the Technology Venturing course, is very costly. “Entrepreneurship education is quite expensive”, said Vice-Rector Asta Pundziene. Programme leaders, invited guest speakers, and mentors need to be paid. KTU has 13 to 14 people working on the EE programme.

6.3. Extra-curricular activities related to entrepreneurship education

There are several extra-curricular activities in entrepreneurship education at KTU. The major activities so far have been carried out in support with Aalto University. KTU representatives reported the following activities:

- In 2013 and 2014, students from KTU took part in the **Silicon Valley Business Plan Challenge** at San José State University. The KTU raised funds to allow students to participate physically. In 2013, the team of students won a prize.
- Accelerator events named “**Start-up Sauna**”, a concept originating from Aalto University, were introduced to KTU in 2013. The sauna events take place twice a year in spring and autumn. They address students and graduates from KTU and other Lithuanian universities. (See a more detailed description in the box-text.)
- There are **start-up weekends** organised or co-organised by the Start-up Space taking place twice a year, in spring and autumn. These weekends are national events in order to attract a larger number of interested students.
- The **Aalto venture programme** delivered lectures on entrepreneurship, dealing with various aspects of business development. The audience was mainly entrepreneurs from KTU start-ups. There was a lecture series from 12 – 15 November 2012 and 7 – 11 January 2013.¹¹³
- Within EU projects there have been opportunities for training entrepreneurs and mentoring start-ups from the KTU.

At the KTU there is, as yet, no specific club or group dealing with entrepreneurship in extra-curricular activities.

Start-up Sauna

Start-up Sauna is an accelerator programme originating from Aalto University. The programme’s owes its name to its Finnish origin and the fact that running through the programme will very likely make founders sweat strongly: “Start-up Sauna connects the most promising start-ups from Nordic countries, Eastern Europe and Russia, with experienced serial entrepreneurs, investors and other industry experts (...). We focus heavily on business development (...). The best teams are brought to Silicon Valley after the accelerator program to get an understanding of the US market, that is, to meet investors, media, customers and

¹¹³ See <http://www.15min.lt/naujiena/svietimas/karstos-zinios/ktu-studentus-verslumo-mokys-stanfordo-ir-aalto-universitetu-profesoriai-234-277259>.

potential partners. Once accepted to Start-up Sauna, a company also gets access to Slush, the leading start-up event in Europe.” (<http://startupsauna.com/accelerator>)

While the Start-up Sauna in Aalto is open to everyone, participation in the local Start-up Sauna events at KTU are subject to application and selection. The local team described the procedure for a Start-up Sauna in September 2014 as follows: “The Start-up Sauna team and coaches review the applications and select the most relevant start-ups from amongst the applications. We concentrate on start-ups with a superb team that can deliver (..) an idea with potential to scale globally, and a finished product or prototype. The start-ups we select for the event are also those we think we can provide the most value to the event.” (<http://ktu.edu/ivc/turinys/startup-sauna-kaunas>.)

While the Aalto Start-up Sauna is a one-month programme, the Start-up Sauna events at KTU last only one day. According to the programme’s self-description, local start-ups attending the event receive the following benefits: “Honest feedback on their business potential and pitch”; “coaching from serial entrepreneurs, investors and other professionals”; “a great network of start-ups and global connections through the coaches”; “update[s] about future Start-up Sauna and Slush events”; as well as opportunities “to be selected to the Start-up Sauna accelerator and Slush”, “to access the Start-up Sauna trip to Silicon Valley”, and “to get 40 000 euros of funding”.

Extra-curricular activities in entrepreneurship education at KTU were co-ordinated by the KTU’s National Innovation and Entrepreneurship Centre.

Extra-curricular EE activities have been funded by dedicated KTU funds and EU projects. There is no regular budget for such activities so that the issue of sustaining them depends on fundraising activities. However, KTU is very active in fundraising for EE.

6.4. Institutional aspects of entrepreneurship education

6.4.1. Organisational set-up and change

Co-ordinating and integrating entrepreneurship education across the University

In 2012, the **National Innovation and Entrepreneurship Centre** (NIEC) was established at KTU. This was a major move towards strengthening entrepreneurial activity and EE, not only at KTU but also in Lithuania at large. According to its strategy statement, the NIEC’s objectives are the following, in the order provided by NIEC:¹¹⁴

- Development and transfer of technology.
- Establishment and development of companies as well as creating innovative products.
- Intellectual property management and protection.
- Education and spread of entrepreneurship and innovation culture.
- Development of a control system of an open access centre.

Thus, the NIEC has an explicit role in promoting EE but not a primary one. The NIEC has a Start-up Space for supporting KTU students or graduates who seek starting a business.

Influence of external stakeholders in the entrepreneurship education programmes

External experts were intensely involved in developing EE at the KTU. (See section 5.5 for further details.)

6.4.2. Laws, statutes and codes

Incentives for staff to engage in or support entrepreneurship education

¹¹⁴ See http://nivc.ktu.edu/en-about_us-15.htm#mm50, last accessed 2/4/2015.

KTU does as yet not offer specific **incentives** to staff to become involved in EE. For those teaching entrepreneurship, it is part of their normal teaching hours. The co-ordinators of the EE offers enjoy the immaterial incentive of collaborating with foreign experts and taking part in related events, for example, the Stanford Technology Ventures Programme.¹¹⁵

However, the case study found **disincentives** in place – “problems of the system”, as Vice-Rector Asta Pundziene called them. A faculty’s budget depends on the number of modules offered. If a module from a different faculty is included, the own faculty’s budget decreases. Hence, “reservations” against EE on the part of deans and professors may rather be “calculations”. If, for example, the number of start-ups per faculty was rewarded with additional funds, deans and professors would assumingly be quite receptive.

Incentives for other stakeholders contributing to entrepreneurship education

External stakeholders were found to normally present their lecturers about entrepreneurship issues pro bono. Their motivation may be “applause from students” and perhaps receiving access to possible new employees, as one interviewee said.

6.4.3. Mindsets and attitudes

Raising awareness for the importance of entrepreneurship

After a training visit to the Stanford Technology Ventures Programme in July 2014, the four KTU experts who participated in the programme concluded that they should give priority to change the mindsets at KTU towards being more entrepreneurship-friendly. In order to fulfil this objective, they considered it an important factor to introduce elements of entrepreneurship in all basic and application-oriented courses. Building upon this, they found that there should be specific courses offering training for those students who are keen on starting a business. In addition, there should be start-up campaigns, mentoring and coaching offers in the future.

Encouraging entrepreneurial behaviour

Establishing the two EE courses was also meant to encourage entrepreneurial behaviour among KTU students.

6.5. Outreach activities related to entrepreneurship education

6.5.1. Building an international network of advisors and peers

Three key organisations consulting KTU

KTU has been developing intense relationships with external stakeholders and supporters. In particular, a network of experts from foreign countries has been built for supporting the development of EE course content and other entrepreneurship offers. There are also contacts with local and national business professionals.

KTU made use of mainly three sources for developing EE: Aalto University, Helsinki, Finland; universities in the San Francisco Bay Area, US (“Silicon Valley”), and US Market Access Centre (US MAC) that helps foreign companies understand the US market. Three foreign experts – one from Aalto, one from University of California, Berkeley, and one from US MAC – actively developed the two EE courses running at KTU in 2014. They acted as the core reference points, inspirational sources, and provided guest speakers.

KTU and **Aalto University** concluded a co-operation agreement for developing entrepreneurship and entrepreneurship education at KTU. This agreement “had a price”, as one interviewee said. The Technology Venturing course was mainly developed with support from experts from Aalto University in Helsinki, Finland. According to Will Cardwell from Aalto, Aalto University went a long way in a short period of time with regard to entrepreneurship and EE. So Aalto can show “how to jump-start such a system”, as Cardwell said. Starting around 2009, the university spent considerable resources on developing an entrepreneurial ecosystem, connecting researchers with entrepreneurs, and developing numerous training courses. The activities were

¹¹⁵ See <http://stvp.stanford.edu>.

largely driven by students. As a result it spun off many new companies, among them a number of success stories. Aalto however, benefitted because of its history in entrepreneurship and EE.

KTU has strong liaisons with universities in the San Francisco Bay Area (**Silicon Valley**) in the US. There is no formal agreement with a Silicon Valley university, just informal agreements and occasional, individual, paid consultation. First of all, Ken Singer, a professor from the University of California in Berkeley, helped develop contacts and also consulted and mentored start-ups from KTU. The Berkeley Method of Entrepreneurship, developed at the University's Centre for Entrepreneurship and Technology, is a "pedagogy that is offered in three interconnected layers of theory, entrepreneurial mindset, and new venture networks".¹¹⁶ The main focus of this approach is on cultural and psychological issues of entrepreneurship. Second, in summer 2014, the four experts driving EE at KTU attended a two-week course of the Stanford Technology Ventures Programme (STVP), a programme operated by Stanford University's School of Engineering.¹¹⁷ Third, KTU has also contacts to San José State University (US), mainly through the University's business plan competition.

US MAC provided expertise to KTU from late 2013 to early 2014. US MAC Co-CEO Chris Burry provided mentoring to start-ups from KTU based in Lithuania as well as advice on teaching entrepreneurship. One of the main messages was that one needs to bring real world experience into EE. The "Lean Launchpad" and "Business Model Canvas" approaches are valuable methods but the key problem is to bring them to life in a certain university's context. Since US MAC is a spin-out from San José State University (SJSU), it was a natural suggestion from US MAC to KTU to let students participate in SJSU's business plan competition.

Co-operation with foreign advisers is planned to last at least until 2016.

KTU considers the EE programmes at Aalto, Berkeley, Stanford and also Cambridge as leaders in the area of teaching entrepreneurship to engineers and thus good examples for KTU.¹¹⁸ KTU also contacted several other organisations to develop its entrepreneurship approach, for example the European Innovation Academy (Nice, France) and Cambridge University (UK), which shall not be dealt with here.

How KTU's network developed

KTU developed its EE network step by step. As a basic decision, KTU sought support from abroad to learn from others. Connections to Aalto University already existed before developing EE, so it was a natural step for KTU to first approach entrepreneurship experts at Aalto due to the latter's reputation in this field. Initially, around twelve representatives from KTU's top management visited Aalto in order to learn about Aalto's approach and how it could possibly be applied at KTU as well. On this visit, KTU representatives were also introduced to experts from the US who co-operated with Aalto. Thus, in a next step, the KTU also targeted experts from the US because start-ups were being given high attention there.

At the time of writing this case study in early 2015, KTU had entered a new phase in collaboration for EE and was searching for new external links to the entrepreneurship education community. Contacts to Aalto, Stanford University and US MAC were, however, sought to be maintained.

Limitations of involving advisors from other countries

Many experts interviewed for this case study mentioned limitations of involving external experts for developing EE. These limitations are related to funds, time, a necessity of own experience, economic and cultural conditions, a need for adaption, as well as the suitability of advisors:

Funding may be a barrier for several reasons. Above all, experts from foreign countries may not necessarily provide services pro-bono. One of the external experts said that "affordability of outside assistance is a real challenge". This may be a particular problem in countries with a relatively low Gross Domestic Product such as Lithuania. Furthermore, while there are also EU funds that can be used for developing EE, one of the external advisors stated that the way EU funds are allocated and awarded is quite difficult. It may also be an obstacle to involve experts outside the EU because EU funding normally has to be spent within the EU. However, the case study also found that some expert services were apparently provided below international

¹¹⁶ See <http://cet.berkeley.edu/curriculum/>.

¹¹⁷ See <http://stvp.stanford.edu/about/>.

¹¹⁸ See Bakanovė/Petraité/Urbanė.

market prices. Experts did not necessarily demand market prices because KTU representatives, including top management, were really serious about developing entrepreneurship, and were open-minded and likable to communicate with. Hence, KTU also provided a kind of immaterial reward by indicating that support services would likely have tangible impact in a country that could benefit considerably from it.

Time may also be a barrier to involving experts from foreign countries. As one interviewee from KTU put it, “involving external experts takes time and money and needs to be planned very precisely”. This shortage of time may lead to trying to do things too quickly, as one of the external advisors mentioned: “I had the impression they were too rushed. They wanted to do things they had not well thought through.” Furthermore, one of the interviewees stated that KTU had already planned an EE curriculum when he became involved – the impact of his advice could have been stronger if he had been involved earlier.

Several interviewees pointed to the **necessity of own experience** for introducing, teaching and developing EE. Instructors may instruct well, but those who are instructed still need to explore on their own. One of the interviewees from KTU used a metaphor for explaining the importance of tacit knowledge: “If you ask a good surgeon how he does it, he can explain, but you still cannot do it yourself.” An interviewee from the US said that the leaders of the successful EE programmes at US universities come from industry, and it would be a challenge all over Europe that professors lack real-world experience.

The impact of support from external experts may be limited by the country’s **economic and cultural conditions**. One interviewee from KTU said that it would of course, be better to have the competence for entrepreneurship education in-house. However, Lithuania does not offer the necessary venture capital and does not have the presence of an entrepreneurial community. The involvement of foreign experts could be even more fruitful if there was a more developed entrepreneurial culture in Lithuania. Several interviewees from KTU and from other countries mentioned a rather underdeveloped investment sector in Lithuania as an impediment to entrepreneurship in the country. Moreover, collaboration between business and the University was found to be limited. One of the reasons may be that Lithuania does not have many companies with a research and development department so that there are few natural counterparts for university researchers. It is, for example, difficult to attract mentors from local businesses.

Local socio-economic conditions may require a **need for adaptation**: Approaches from other countries may not work if they are tried to be transferred one-to-one.¹¹⁹ The adopting university may need to adjust approaches to its specific situation, i.e. to human and financial resources available as well as to the culture, traditions and support infrastructure at the university and in the environment. KTU was found to seek adapting approaches from other universities to KTU’s specific preconditions. For example, Vice-Rector Asta Pundziene pointed out that KTU would not want to emphasise start-up promotion as much as other universities do. Rather, KTU is seeking more broadly to establish an entrepreneurial culture at the University and to make students aware of different career opportunities.

Last but not least, as regards **suitability of advisors**, even universities with a very high reputation in entrepreneurship may not necessarily be the most suitable ones for advising certain other universities. For example, one interviewee said that “the problem with Stanford University is that they are much different from other universities”, which may limit transferability of their ways of doing things, and they may have some degree of “success blindness”.

Peer-to-peer consultation

As a consequence of limitations from of involving external experts, one interviewee suggested more “co-development”, i.e. co-operating with other universities that are on a similar level of EE development. KTU actually has, for example, contacts to the Monterey Technology Enterprise Team from Mexico who were part of the SVTP team seminar in summer 2014. Since they were in 2014 on a fairly similar level as KTU, they provided some kind of “peer coaching”.

¹¹⁹ There are incidences that such one-to-one copying is sought. One of the foreign experts stated that a Chinese university actually copied (or tried to copy) a university’s EE approach.

6.5.2. Further external stakeholders

Enterprises

Most external stakeholders who are involved in EE at KTU are business people, mainly from technology-based firms – SMEs because there are no large technology-based firms located in the Kaunas region. Companies are represented in the University's advisory council. Many companies support entrepreneurship-related events such as the start-up weekends.

Incubators, accelerators, science parks and technology parks

In November 2014, a new Science, Technology and Business Centre opened on the KTU campus.¹²⁰ It is part of the recently established "Santaka Valley", a large science, education and business centre.¹²¹ The main purpose of Santaka Valley is confluence of public and private research and the provision of knowledge-intensive services. The centre's technological focus is on sustainable chemistry and bio-pharmacy, future energy, mechatronics, information and communication technologies.¹²²

6.6. Impact and lessons learned

6.6.1. Evaluating impacts of entrepreneurship education

Evaluating students' learning progress

The most important means for evaluating EE impacts at KTU is a two-tier survey of students' entrepreneurial knowledge, abilities and skills at the beginning and the end of the courses. KTU Business School developed a specific method for their surveys. Students have to fill in a structured, virtual questionnaire with basically the same questions in the first and the second tier. The questionnaire uses a five-point Likert Scale with 1 = bad, 2 = satisfactory, 3 = average, 4 = good, and 5 = perfect. The results provide a self-assessment of what the students learned. Indicators include the following:

- **Entrepreneurial knowledge:** conceptual understanding of entrepreneurship; conceptual understanding of entrepreneur; familiarity with the concept of creativity and creativity techniques; knowledge in the field of team building and teamwork; awareness of the lean start-up methodology; conceptual understanding of business model; awareness of the funding resources for a start-up; familiarity with the aspects of intellectual property protection.
- **Entrepreneurial abilities:** ability to be creative, ability to build a multidisciplinary team, ability to work in a multidisciplinary team, ability to validate a business idea, ability to commercialise one's competencies.
- **Entrepreneurial skills:** public speaking skills; skills for expressing oneself in writing; skills for boosting creativity in others; interviewing skills; business model designing skills.

A survey of 26 students in 2014 found that students improved in all indicators.¹²³ The strongest increases were found for "awareness of the lean start-up methodology" (from a mean of 1.92 before the course to 4.35 after), awareness for the funding resources for a start-up (from 2.54 to 4.42) and for "business model designing skills" (from 2.46 to 4.15).

Numbers and examples of start-ups from KTU

KTU seeks keeping track of start-ups from the University. The number of young companies supported at the Start-up Space indicates an increasing trend. Since 2012, when the Start-up Space was founded, the facility hosted 36 companies. In a few of these companies, the participating students were ones who had attended an entrepreneurship course at KTU. Some of these companies already allow the founders to earn a living.

¹²⁰ See <http://ktu.edu/en/lmip/newitem/santaka-valley-ktu-science-technology-and-business-centre-architectural-vision-synergy>.

¹²¹ See <http://www.santakosslenis.lt/en>.

¹²² See http://www.santakosslenis.lt/en/the_santaka_valley.

¹²³ See Bakanová/Petraité/Urbané.

Examples of companies started by KTU students and hosted by Start-up Space include the following:

- alovita¹²⁴, a company that developed a multifunctional care bed;
- BLIU BLIU¹²⁵, a platform to learn languages;
- sneakyBox¹²⁶, an augmented reality and computer games developer;
- InLoga¹²⁷, an electronic devices design and development company;

As well as the seoHelis service company¹²⁸, Power of Eye, and EVJ Lighting¹²⁹.

Outlook to possible future impacts of entrepreneurship education at KTU

While at the time of writing the case study it may have been too early to assess the impacts of entrepreneurship education at KTU, one can assess the existing base from which future impacts may emerge. One of the interviewees said that the ground is fertile: Engineering students are very competent in their subjects, some are highly interested in starting a new business, and KTU already counts several successful start-ups. However, it was also stated that business understanding was still fairly basic. *Nota bene*, KTU does not consider an increase in the number of start-ups as a primary objective. Rather, entrepreneurship education is supposed to “help students make up their minds what they are: entrepreneurs, employees, inventors, ...?”, as Vice-Rector Asta Pundziene said.

In order to successfully develop entrepreneurship and EE at a university, one interviewee said it would be most important to “get the most influential faculty members excited about it first”. Other faculty members may then follow. However, it was also stated that it is “not easy to make hard scientists believe in entrepreneurship”. It was said that KTU already completed the first steps in this respect.

6.6.2. Lessons learned

Summary of lessons learned from this case

The KTU case provides several lessons for other universities seeking to establish and develop an entrepreneurship education programme. The case may in particular provide lessons for other universities seeking foreign advice in establishing EE, especially technical universities.

- **Helpfulness of external expertise:** Intense consultation with external experts from other countries was found to be fruitful at KTU for developing EE. Such consultation may thus be a road to follow for other universities. It may be advisable to involve external experts right from the beginning of planning EE, in order to maximise their impact on EE endeavours.
- **Limitations of external expertise:** There are limitations of involving external experts for developing EE. Firstly, consultations from external experts may be costly and funds are always limited. Second, involving external experts takes time for thorough planning and for carrying out consultation visits. Third, EE may be most beneficial when the experts from the consulted university have their own experience in entrepreneurship, which is not necessarily the case. Third, there may be unfavourable economic and cultural conditions in the country or region, for example a lack of appreciation for entrepreneurship and a lack of contact between universities and businesses. Fourth, there is a need for adaption of foreign approaches to local conditions. Fifth, there is a need to select advisors thoroughly because not all may be suitable for the specific EE targets aimed at by the university. Hence it may be advisable to plan the involvement of external experts thoroughly.
- **Starting from established contacts:** KTU built its international network connections for developing EE initially through established contacts. KTU then expanded the network to

¹²⁴ See <http://www.alovita.eu>.

¹²⁵ See <https://bliubliu.com/en>.

¹²⁶ See <http://sneakybox-studios.com>.

¹²⁷ See <http://inloga.eu/?lang=en>.

¹²⁸ See <http://www.seohelis.lt>.

¹²⁹ See <http://carcamsonline.com/video/9kSAbOic7CE/3-different-EVJ-LIGHTING-prototypes.html> for a prototype.

partners that were found to be particularly suitable and at the top end of worldwide experience. In the case of KTU, this was an existing connection to Aalto University in Finland, which led further to co-operation partners in the Silicon Valley, US. Using such established contacts may ensure a necessary level of trust.

- **Seeking additional peer coaching:** Beyond foreign advisors, who may normally be paid, it may also be helpful to interact with peers, i.e. with universities at a similar point in developing EE.
- **Overcoming internal barriers:** The KTU case also shows that proponents of EE may have to overcome barriers to implement EE within the university. Such barriers may be related to reservations against entrepreneurship as a “soft science” as well as competition among faculties about scarce resources for courses. Foreign advisors may help convince sceptics through their knowledge and experience, but foreign advisors may not be able to simply wipe out such barriers.

Transferability to other universities

The KTU case may be insightful for any other European university that starts from scratch to introduce entrepreneurship education. Universities from Eastern Europe and also technical universities may find the case particularly relevant.

References

Research for this case study was conducted by Dr. Stefan Lilischkis, Senior Consultant at empirica GmbH, Bonn, on behalf of the study for supporting the entrepreneurial potential of higher education (sepHE). Sources and references used include desk research plus the following:

Interviews

- Violeta Kaunelienė, Head of Intellectual Property Management Group, National Innovation and Entrepreneurship Centre, Kaunas University of Technology, 7 August 2014 (phone) and 26 February 2015 at KTU.
- Monika Petraité, Head of Department of Strategic Management, School of Economics and Business, KTU, 22 September 2014 (phone).
- Will Cardwell, Senior Lecturer and Advisor, Aalto Executive Education, Aalto Ventures Programme, 24 September 2014 (phone).
- Alex Sozonoff, CEO, FlyVictor; member of the Investment Advisory Council of the Lithuanian Ministry of Economy, 2 December 2014 (phone).
- Ken Singer, Managing Director, Center for Entrepreneurship and Technology, University of California at Berkeley, US, 5 December 2014 (phone).
- Chris Burry, Co-CEO, US MAC, 17 December 2014 (phone).
- Asta Pundziene, Vice Rector for Research, KTU, 6 January 2015 (phone), and 26 February 2015 at KTU.
- Sarunas Mancius, 1st year student, KTU, 25 February 2015.
- Laima Masalevičiute, 4th year student, KTU, 25 February 2015.
- Assoc. Prof. Dainius Martuzevičius, Vice Dean for Research, Faculty of Chemical Technology, KTU, 25 February 2015.
- Fabian Sepulveda, Partner at Courage Ventures, Aalto University Executive Education, Aalto Ventures Programme, interview at KTU on 26 February 2015.

Participations

- Tour through KTU Startup Space together with representatives of the Aalto Ventures Programme, guided by Liutauras Palaitis, Head of Entrepreneurship and Entrepreneurship Education Department, 25 February 2015.
- Observation of a mentoring session for a new business at KTU's Startup Space, mentoring by Fabian Sepulveda, 26 February 2015.
- Guided tour through the Santaka Valley R&D Centre together with representatives from the Aalto Ventures Programme, 26 February 2015.

Literature

Bakanovė, Agnė; Petraitė, Monika; Urbonė, Renata: Curriculum Development for Technology Based Entrepreneurship Education: Cross Disciplinary and Cross Cultural Approach. (Forthcoming.)

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KTU, Kaunas University of Technology (2012): Kauno Technologijos Universiteto Strategija (Strategy of Kaunas University of Technology). (Available at http://ktu.edu/sites/default/files/bylos/Dokumentai/ktu_strategija.pdf, last accessed 16/9/2014).

Websites

Berkeley Method of Entrepreneurship: <http://cet.berkeley.edu/curriculum/>, last accessed 8/4/2015.

KTU to Establish Innovation and Entrepreneurship Centre, KTU News, announce date 8/2/2012: <http://en.ktu.lt/content/news/ktu-establish-innovation-and-entrepreneurship-centre> (last accessed 18/9/2014 - the news is in fact about the co-operation agreement between KTU and Aalto, not about the IEC).

National Innovation and Entrepreneurship Centre: <http://ktu.edu/ivc/en/> (last accessed 16/9/2014).

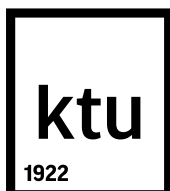
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Panevezys Science and Technology Park: <http://en.ktu.lt/content/structure/panevezys-science-and-technology-park> (last accessed 16/9/2014).

Stanford Technology Ventures Programme: <http://stvp.stanford.edu/> (last accessed 17/9/2014).

Annex

Annex 1: Study module programme "Technology Entrepreneurship"



KAUNAS UNIVERSITY OF TECHNOLOGY

STUDY MODULE PROGRAMME (SMP)

Module Code	S	000	B	177	Accredited until	2016	09	01	Renewal date		
	Branch of Science		Progr.	Registr. №.							

Entitlement

Technology Entrepreneurship

Prerequisites

n.a.

Main aim

To provide the basic entrepreneurial skills, based on the interaction of technology knowledge transfer and entrepreneurial skills for start up development.

Course (module) Learning Outcomes

№.	Learning Outcomes	Teaching / Learning Methods	Assessment Methods
1		Discussion, Formal lecture, Guests lectures, Reflective journal	Oral presentation, Self-assessment, Student blog
2		Formal lecture, Guests lectures, Role play	Oral presentation, Self-assessment, Student blog
3		Case analysis (Case study), Discussion, Formal lecture, Guests lectures	Group (team) project, Reflection on action, Self-assessment, Student blog

Summary

The course aims to introduce fundamentals of technology and R&D driven entrepreneurship, and provide the basic knowledge on the processes used by technology entrepreneurs to start companies. It develops basic skills of taking a technology idea and finding a high-potential commercial opportunity, gathering resources such as talent and capital, figuring out how to sell and market the idea, and managing rapid growth of an enterprise.

Level of module

Level of programme		Subject group
Cycle	Type	
First	Bachelor	Core Subjects of the Study Field

Syllabus

Nº.	Sections and themes
1.	Inspiration: entrepreneurship, creativity and technologies
1.1	The essence of technology driven entrepreneurship
1.2	Entrepreneurial leadership in technology venturing
1.3	Business model for an individual entrepreneur
2.	Creativity sources and improvisation in technology business
2.1	Creativity and creativity methods in technology venturing
2.2	Entrepreneurial team formation and teamwork
3.	Technology business design
3.1	Lean start-up methodology
3.2	Business model design
3.3	Validation of the business model
3.4	Sources for financing of technological business
3.5	Intellectual property issues in technology entrepreneurship
3.6	Business model pitch for stakeholders

Evaluation procedure of knowledge and abilities:

Ten grade and gathered evaluation system is applied. The semester's individual work tasks are evaluated by grades; the final grade is given during the examination session while multiplying particular grades by the lever coefficient and summing the products.

References

Nº.	Title	Edition in KTU library		In KTU bookstore	Number of ex. in the methodical cabinet of the depart.
		Pressmark	Number of exemplars		
1.	Ragauskas A., Kriaučionienė M. 2008 . Inovacijų vadyba. Mokomoji knyga			No	20
	<i>Comment: available via KTU e-books</i>				
2.	Ostaševičius V., Kriaučionienė M., Kaunelienė V. 2007. Inovacijų valdymas. Vadovėlis.		20	No	10
3.	Jucevičius, G.; Kriaučionienė, M.; Ragauskas, A. Inovatika ir globali žinių ekonomika: vadovėlis / Kauno technologijos universitetas. Kaunas, 2008. 191 p. ISBN 9786098007053		20	Yes	
4.	Jucevičius R., Urbonė R. Intelektuali antreprenerystė: fenomenas, kontekstas, perspektyvos. Mokomoji knyga. 2008. ISBN 978-609-02-0474-0			Yes	

№.	Title	Edition in KTU library		In KTU bookstore	Number of ex. in the methodical cabinet of the depart.
		Pressmark	Number of exemplars		
5.	Cooper, Brant, Vlaskovits, Patrick. Lean Entrepreneur : How Visionaries Create Products, Innovate with New Ventures, and Disrupt Markets. Wiley, 2013. eISBN: 9781118334089.			No	
<i>Comment: Electronic resource available via Ebrary database.</i>					

Additional literature

№.	Title
1.	Bessant, J. Tidd, J. 2007 Innovation and entrepreneurship. John Wiley & Sons, 2011, ISBN 978-0470711446
2.	Tidd, J., Bessant, J., Pavitt, K. (2008). Managing innovation. Integrating technological, market and organizational change. John Wiley and sons. ISBN 978-0-470-99810-6
3.	Steve Blank, Bob Dorf. The Startup Owner's Manual: The Step-By-Step Guide for Building a Great Company. K&S Ranch, 2012. ISBN 978-0984999309
4.	Vyakarnam, S., Hartman, N. Unlocking The Enterpriser Inside! A Book Of Why, What And How! World Scientific Publishing Company, 2011. ISBN 978-9812818744
5.	Thomas Lockwood. Design Thinking: Integrating Innovation, Customer Experience, and Brand Value. Allworth Press, 2009. ISBN 978-1581156683
6.	Tina Seelig. inGenius: A Crash Course on Creativity. HarperOne, 2012. ISBN 978-0062020703
7.	Stefan Lindegaard, Guy Kawasaki. The Open Innovation Revolution: Essentials, Roadblocks, and Leadership Skills. Wiley, 2010. ISBN: 978-0-470-60439-7
8.	Lee, Charles T. Good Idea. Now What? : How to Move Ideas to Execution. Wiley, 2011. eISBN: 9781118226179
9.	Feld, Brad; Batchelor, Amy. Startup Life : Surviving and Thriving in a Relationship with an Entrepreneur. Wiley, 2013. eISBN: 9781118516867
10.	Caldicott, Sarah Miller. Midnight Lunch : The 4 Phases of Team Collaboration Success from Thomas Edison's Lab. Wiley, 2012. eISBN: 9781118421963
11.	Lankow, Jason Crooks, Ross Ritchie, Josh. The Power of Visual Storytelling. Wiley, 2012. eISBN: 9781118420065
12.	Cases in technological entrepreneurship : converting ideas into value / edited by Claudio Petti ; preface by Aldo Romano. Cheltenham : Edward Elgar, 2009. ISBN: 9781848441866

Coordinating lecturer

Position	Name, surname	Schedule №.
Professor	Eduardas BAREIŠA	0902
Professor	Algimantas VALINEVIČIUS	4648
Professor	Monika PETRAITĖ	9445
Senior Research Assistant	Andrius VILKAUSKAS	9924
Professor	Rytis KRUŠINSKAS	2672

Assoc. professor	Dainius MARTUZEVIČIUS	2692
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Subdivision

Entitlement	Code	Contribution, %
Department of Environmental Engineering	0208	5
Faculty of Informatics	14	5
Faculty of Mechanical Engineering and Design	11	5
Faculty of Electrical and Electronic Engineering	03	5
Finansų katedra	0601	5
Strateginio valdymo katedra	0605	75

Study module teaching form №. 1

Semester		Mode of studies	Structure				Total hours	Credits
			Lectures	Pract.	Lab.	Ind. work		
A	S	D	36	28	0	96	160	6

Languages of instruction:

Lithuanian	L	English	E	Russian	R	French	F	German	G	Other	Oth.
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Plan of in-class hours

№. of Themes	Academic hours			№. of Themes	Academic hours		
	Lectures	P	L		Lectures	P	L
1.1	3	2	0	3.2	12	8	0
1.2	2	2	0	3.3	2	2	0
1.3	3	2	0	3.4	2	2	0
2.1	2	2	0	3.5	2	2	0
2.2	2	2	0	3.6	3	2	0
3.1	3	2	0				
Total:					36	28	0

Schedule of individual work tasks and their influence on final grade

	№. of syllabus	Total hours	Influence on grade, %	Week of presentment of task (*) and reporting (o)																
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17-20
Oral presentation	1-3	23	15	*														0		
Peer-assessment	1-3	4	10	*														0		
Student blog	1-3	16	20	*														0		
Reflection on action	1-3	8	20	*														0		

	Nº. of syllabus	Total hours	Influence on grade, %	Week of presentment of task (*) and reporting (o)																
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17-20
Group project (team)	1-3	45	35			*													0	
Total:	-	96	100																	

Annex 2: Study module programme “Technology Venturing”



TECHNOLOGY VENTURING

Technology venturing course is particularly dedicated for those that feel excited about starting a new venture or for those that already have started their business. The attendees have the opportunity to learn and practice the fundamental skills required to assess a business concept or product in the framework of a business opportunity, to get a lot of experience while working in teams and finally to give a space for personal grow as an entrepreneur. The course focuses on products and services with an innovative and engineering based advantage that will provide sustainable differentiation. We will explore the opportunity to build a business around a realistic and actionable concept.

Technology venturing course will provide business and venturing competences for transferring technology concept into the business model, venture capital attraction and shape entrepreneurial behaviour as a professional feature. During the Technology Venturing course the attendees will learn about the early-stage entrepreneurship including: technology business opportunity assessment, business and product development, entrepreneurial marketing and etc. (see table 1).

Table 1. Time table for Technology Venturing course

Dates	Topics to be covered in the class	Instructors
<i>Teaching in class</i>		
31/03/2014	<p>Morning session: Introductory lecture on market research and idea development & Business opportunity validation</p> <p><i>This session will provide with the knowledge on what market research is and why it is necessary for reshaping current business idea.</i></p> <p><i>Methods and tools for opportunity validation is going to be introduced.</i></p> <p>Lunch Break</p> <p>Afternoon session: BMC workshop</p> <p><i>During the workshop you will get to know the essence of business model and how to design it.</i></p> <p><i>The instrument of business model canvas will be introduced so that you are free to design the business model for your idea.</i></p> <p>Assignment no. 1: Small scale market research</p>	<p>Dr. Fabian Sepulveda, Aalto University;</p> <p>Prof. Dr. Monika Petraitė,</p> <p>Dr. Renata Urbonė,</p> <p>Dr. Agnė Bakanovė, Kaunas University of Technology</p>
01/04/2014	Morning session:	

	<p>Discussion on the assignment no 1 Interactive session for short presentations and feed backing in class.</p> <p>Entrepreneurial marketing. Go-to-market strategy Content session (lecture) on how to plan a good marketing campaign and choose the proper way for entering the market with the value proposition.</p> <p>Assignment no. 2: Desktop research</p> <p>Lunch Break</p> <p>Afternoon session: Desktop research in the class You will implement the assignment no 2, present the results in front of the audience and get the feedback.</p> <p>Q&A session. Time for your questions and coaching</p>	
02/04/2014	<p>Morning session:</p> <p>Discussion on the assignment no 2, Pivoting based session for short presentations and feed backing in class.</p> <p>Lean product development Content session for knowledge building around agile and customer development.</p> <p>Lunch Break</p> <p>Afternoon session: Entrepreneurial finance Content session during which you will be introduced with the basics of finances for startups.</p> <p>Assignment no 3: To calculate the estimate financials</p> <p>Q&A session. Time for your questions and coaching</p>	
03/04/2014	<p>Morning session:</p> <p>Discussion on the assignment no 3 and coaching on financial calculations From the live example you will learn on how to finance the idea and the most important core stones have to be taken into account.</p> <p>Capitalization and valuation & Venture capital relations Content session for provision with the understanding on how to manage the shares, what should be proposed for the VCs and etc.</p>	

	<p>Lunch Break</p> <p>Afternoon session: How to estimate your financials? <i>Interactive exercise designed for learning the financial estimation.</i></p>	
04/04/2014	<p>Morning session:</p> <p>Business communication for startups.</p> <p>Pitching <i>Content session on how to pitch yourself and your business to VCs, potential clients, partners and other stakeholders.</i></p> <p>Preparing for the pitch <i>Time for questions and coaching</i></p> <p>Lunch Break</p> <p>Afternoon session: Pitching in practise (7-10 min pitch & feed backing)</p> <p>Course wrap-up and further steps for mowing on</p>	

* - there might be some minor changes in the topics during the process

The classes start at 9:30 a.m. and end at 5:30 p.m. The auditorium is 304, Food Science and Technology Center (the address is Radvilėnų pl. 19 B, Kaunas).

Dr. Fabian Sepulveda,

A start-up mentor, Lean Launchpad trainer, Entrepreneurship lecturer at Aalto University and a co-founder and CEO of *EyEscubed*

Prof. Dr. Monika Petraitė,

A start-up mentor, STVP faculty fellow, Entrepreneurship lecturer at KTU, EU and Lithuanian expert of Innovation politics and practice

Dr. Renata Urbonė,

A start-up mentor, Lean Launchpad Fellow, Entrepreneurship lecturer at KTU, project management practitioner

Dr. Agnė Bakanovė,

A start-up mentor, STVP faculty fellow, lecturer and Technology Venturing course coordinator at KTU, manager Of Entrepreneurship project Inostartas

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Annex 3: Programme of Start-up Sauna at KTU

Renginio vieta: Room 337, Studentų st. 48A, Kaunas

Pradžia: 2014-09-16

Renginio laikas: 10.00

Northern and Eastern Europe's top accelerator, Start-up Sauna, is coming to Kaunas Technical University on September 16th to help the most promising early-stage companies in Kaunas together with KTU StartupSpace!

What is Start-up Sauna? <https://www.youtube.com/watch?v=Z6Nj0v5dc5w>

IMPORTANT! The event application form is hosted this year in f6s. All the applications to the event should go there. Event application is already open and closes on 9th of September: <https://www.f6s.com/startupsaunainkaunas-sep16th#/apply>

The Start-up Sauna team and coaches review the applications and select the most relevant start-ups from amongst the applications. We concentrate on start-ups with a superb team that can deliver, an idea with potential to scale globally, and a finished product or prototype. The start-ups we select for the event are also those we think we can provide the most value to through the event. So please, put some efforts in filling up the registration!

Local start-ups attending the event get:

- Honest feedback on their business potential and pitch
- Coaching from serial entrepreneurs, investors and other professionals
- A great network of start-ups and global connections through the coaches
- Updated about future Start-up Sauna and Slush events
- An opportunity to be selected to the Start-up Sauna accelerator and Slush
- An opportunity to access the Start-up Sauna trip to Silicon Valley
- An opportunity to get 40 000 euros of funding (convertible note + grant)

Startup Sauna Coaches: Magnus Kumlin, Jan-Erik Nyrövaara, Saku Everi, Mindaugas Glodas, Artūras Bulota, Rokas Tamošiūnas, Darius Dulskis.

Event Day Schedule

Before the event

9.00 - 10.00 general setup, teams upload their slides, coffee served

Morning

10:00 - 10:30 Welcome by Start-up Sauna, the local partner and coaches

10:30 - 12:30 Start-ups pitching (3 minutes with slides + a short Q&A)

Lunch break

12:30 - 13:30 Lunch at the venue or nearby restaurant

13:30 Announcing the teams selected for the afternoon session

Afternoon

13:30 - 16:30 20-minute 1on1 coaching sessions

16:30 - 16:45 Coffee break (Startup Sauna, the local partner and the coaches choose a couple of top-performing start-ups)

16:45 - 17:00 General feedback and announcing the top performers

Evening

19:00 Networking and drinks together with the local start-up community

Event will be held in English!

(Source: <http://ktu.edu/ivc/turinys/startup-sauna-kaunas>)

7. Technical University of Kosice, Slovakia: Extra-curricular entrepreneurship education activities and start-up coaching within the region

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Abstract



The Technical University of Kosice (TUKE), Slovakia, is located in Kosice, the main city in Eastern Slovakia and the European Capital of Culture 2013. TUKE is a fully-fledged university with a strong technical tradition. It offers curricular entrepreneurship education mainly through its Faculty of Economics, in particular courses in entrepreneurial management and developing entrepreneurial skills. The main emphasis of entrepreneurship education at TUKE is on extra-curricular activities. These include a training programme and a linked start-up weekend for students to develop their own business ideas and start-ups (the AZU initiative), as well as infrastructure to coach individual student start-up projects and regional entrepreneurs (in the Start-up Centre). Within these activities the university integrates regional and national co-operation partners and their knowledge resources in supporting entrepreneurial ventures. This enables a flexible integration of university members with entrepreneurial motivation (staff, students, alumni) as well as a scaling of entrepreneurship education on campus. At the same time it brings about the task of co-ordinating and sustaining single activities over time. Institutionalisation of an infrastructure for extra-curricular entrepreneurship education is currently mainly indirect. It has developed through start-up coaching and training for individual student or staff teams within general technology transfer activities in the university's start-up centre and the prospective science park.

Case study fact sheet

▪ Full name of the university:	Technical University of Kosice (TUKE); Kosice, Slovakia
▪ Legal status (e.g. public or private)	Public
▪ Location (if applicable: branches):	Kosice Campus
▪ Year of foundation:	1952
▪ Number of students:	Approx. 10.600 (as per October 2014)
▪ Number of employees:	Approx. 1.800 (of which 900 in teaching and 900 in research and administration)
▪ Budget in most recent financial year:	Approx. 42 million Euro (2013)
▪ Academic profile:	TUKE is a well-established technical university with seven technical faculties (Mining, Ecology, Process Control and Geo-technology; Metallurgy; Mechanical Engineering; Electrical Engineering and Informatics; Civil Engineering; Manufacturing Technologies; Aeronautics) and, since the 1990s, a Faculty of Economics and a Faculty of Arts
▪ Entrepreneurial profile:	Entrepreneurship education offers within curricula are predominantly hosted within the Faculty of Economics; there is strong focus on extra-curricular entrepreneurship activities organised by individual university members and partners in the Kosice region
▪ Activities focused in this case study:	Extra-curricular activities in entrepreneurship education in co-operation with external, in particular, regional partners (AZU Programme; Start-Up Weekend; TUKE Start-Up Centre coaching of start-ups from the region of Eastern Slovakia and to student start-up project teams
▪ Case contact person(s):	Veronika Duricova, Faculty of Economics, TUKE

Information included in this case study is from end of year 2014 unless stated differently.

7.1. The university's entrepreneurial profile

7.1.1. The university's overall approach to entrepreneurship education

In Slovakia's higher education sector, entrepreneurship is still a developing and unfolding theme, which is not yet fully anchored in national higher education legislation as a standard function of universities. Slovakian university institutions are therefore in the process of building their infrastructure for supporting and teaching entrepreneurship with contributions from external stakeholders like public and private organisations, initiatives, and networks in start-up support and consulting (e.g. the SPOT; Junior Achievement; KPMG), as well as individual Slovakian entrepreneurs (see 7.3.3 and 7.5). The Technical University of Kosice (TUKE) implemented entrepreneurship in its course curricula and study programmes predominantly through the Faculty of Economics. The faculty offers entrepreneurship courses to its own bachelor students, but also to selected faculties in engineering and science (see 7.2). There are both introduction courses to entrepreneurship and a more hands-on format where students work on their own business ideas and plans culminating in student campus firms. Overall the portfolio of entrepreneurship courses is still developing and not yet fully diversified across different faculties, degree programmes and other target groups.

The strength of TUKE is in supporting and engaging individual university actors and institutions to establish, offer, and integrate extra-curricular activities to create entrepreneurial mindsets (e.g. the AZU programme), a start-up weekend, and business idea competitions (see 7.3.3). This represents a suitable strategy for the university organisation, which is still in the process of building a fully-fledged entrepreneurship curriculum. Extra-curricular foci allow TUKE to integrate partners from the Kosice region (e.g. the Kosice IT Valley or initiatives around the 2013 European Capital of Culture Kosice) and national new venture support organisations (see 7.3.3), as well as offering entrepreneurship education (EE) on an efficient internal resource base.

In addition, the university engages in EE indirectly within its technology transfer and spin-off activities via the coaching of individual student (and staff) teams and their start-up projects, as well as training workshops and business idea contests on campus for nascent university entrepreneurs. This is institutionalised through a new Start-Up Centre serving student and graduate entrepreneurship, while a projected Science Park (the Technicom) is to support entrepreneurial activities of university research staff and institutes (see 7.3.6 and 7.4.1).

7.1.2. Leadership and governance

Importance of government strategies

The role of the Slovakian government is instrumental in terms of the context in which entrepreneurship in higher education is offered and, more importantly, with regard to public policy support in building an infrastructure for entrepreneurship (education) at the university. The government also continues to support the TUKE Start-up Centre through the Slovak Business Agency. The most significant influence of government support is a project grant to support the establishment of the Science Park "Technicom" on the premises of TUKE with two regional university partners. The establishment of the park is still in a project state. It is planned to be finalised this year with funding of operations of the science park (including the support of university start-ups and coaching entrepreneurs), which are still to be acquired (see 7.4.1).

Importance of entrepreneurship in the university's strategy

The role of the university leadership and its strategy has been considered important in bridging and communicating existing challenges and barriers. The strategy has been especially important for further implementation of entrepreneurship and EE infrastructure with regard to the Slovakian Government and its role in shaping public higher education policy. Interlocutors from university management institutions involved in entrepreneurial activities considered TUKE to currently concentrate more on technology transfer and the entrepreneurial training support and coaching implicit in this rather than on immediate (curricular) entrepreneurship education. This corresponds with the observed EE activities which predominantly take place in the extra-curricular domain (see 7.3.3).

Organisational implementation

Curricular EE is mostly anchored in TUKE’s Faculty of Economics. Like private banking, entrepreneurship also used to be uncommon in Slovakia prior to its transition to a market economy. Similar to banking and managerial finance, the theme has found a home within business and economics at the university. However, unlike banking and investment, which is an institutionalised department within the faculty, entrepreneurship appears more to be an interdisciplinary topic in the process of establishment with university staff from different departments (mainly from the Department of Regional Science and Management) engaging in EE teaching and coaching activities (see 7.2 and 7.3).

7.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

Since the university’s EE profile is characterised mostly by extra-curricular activities, there is only a small set of people and supporting material resources for entrepreneurship teaching (note that there is no specific entrepreneurship professor chair or tenured research and teaching position in entrepreneurship currently at TUKE). Curricular EE teaching is delivered by a small group of people from the Department of Regional Science and Management including external lecturers (both at the course level – see the course Development of Entrepreneurial Skills in section 7.2.3 – and in the context of individual course sessions or events; e.g. teaching on a specific topic of entrepreneurial management). However, people of the university (teaching and research staff; alumni; current students) are additionally involved in various extra-curricular activities discussed in 7.3 below.

7.2. Entrepreneurship in curricula and teaching

7.2.1. Overview about curricular offers

At TUKE entrepreneurship has been considered as an attractive path for the further development of the curricular profile of degree programmes in the Faculty of Economics. This is particularly the case in the faculty’s Department of Regional Sciences and Management, however entrepreneurship is also offered to other bachelor-level students in other departments such as the Departments of Finance and Banking and Investment. Centrally, there is fundamental introductory course “Enterprise and Entrepreneurship” which is compulsory for bachelor students in the Faculty of Economics. In addition, two consecutive courses are offered as an elective – Development of Entrepreneurial skills I and II (for an overview of degree programmes and courses see Faculty of Economics, 2013). Further details of these courses and the Enterprise and Entrepreneurship course are described in 7.2.3 below.

Exhibit 3: Overview about curricular EE offers at the Technical University of Kosice (TUKE)

No.	Name	Objectives	Target group	No. of participants in 2013
1	Enterprise and Entrepreneurship	Familiarise students with the basic concepts of entrepreneurship	Bachelor students of Faculty of Economics and Faculty of Electrical Engineering and Informatics	Approx. 300
2	Development of entrepreneurial skills I	Acquaint students with business plans as a tool for start-up planning; students write their own business plan for a start-up	Bachelor students of Faculty of Economics	Approx. 25
3	Development of entrepreneurial skills II	Students implement their business plan (from part I of the course) and set up a student company (in cooperation with Junior Achievement Slovakia)	Bachelor students of Faculty of Economics	Approx. 25

7.2.2. Target groups

Curricular EE offers at the university address initial education at the early stage of bachelor studies to introduce students to entrepreneurial thinking and concepts (in the course “Enterprise and Entrepreneurship”).¹³⁰ EE is offered at the Faculty of Economics in the three bachelor study tracks in “Finance, Banking, and Investment”, “Public Administration and Regional Development”, and “Business Informatics”. The latter programme is offered in cooperation with the Faculty of Electrical Engineering and Informatics where it is one of a number of different undergraduate degree programmes. However, for students from other faculties, no immediate access to curricular EE has been co-ordinated and institutionalised to date. The focus of the university organisation is currently more on establishing and fostering (extra-curricular) support and coaching of students or student teams in individual projects related to the development of business ideas and the establishment of start-up firms (see 7.3.3. and 7.3.6).

7.2.3. Designing lectures and courses – basic curricular decisions

Intentions

In terms of organisational intentions or objectives of curricular EE, the approach of TUKE is fairly straightforward. It aims to open student minds toward entrepreneurial thinking and the role of entrepreneurship in introductory offers, and to develop students’ entrepreneurial skills by founding campus companies and supporting formative and reflective business planning for student companies. Yet the envisioned aims are so far limited mostly to entrepreneurship as a theme in business studies and economics (see 7.2.1 and 0 above), which is why a further differentiation of EE intentions across different disciplines and degrees still has to unfold over time. In terms of supposed direct outcomes of EE (e.g. start-up ambitions in teaching for entrepreneurship), the expectations regarding the “Enterprise and Entrepreneurship” course are fairly low since this is an introductory offer for young first-year bachelor students; however, this offer familiarises students with entrepreneurship early on in their studies. In contrast, the two-semester entrepreneurial skills course, while not exclusively tailored to teach entrepreneurship, has the expected outcome of founding student start-up firms which may be continued after the course (see the next section on details of these offers). Beyond the aims of individual courses, the overall objectives of entrepreneurship for the university organisation as a whole are more implicit in supporting selected extra-curricular activities and individual campus start-up projects in co-operation with regional partners (see 7.3 and 7.5).

Contents

In this section, the course **Development of Entrepreneurial Skills** will be presented as an example of EE at the Technical University of Kosice. The course is divided in *two parts (I and II)* running one semester each (see 7.2.4). The central aim in the first semester is for students to create their own business ideas in teams of around five people and develop a business plan proposal. In the second semester, the ideas and the associated business plans will be presented, and the group, together with the instructor, will select one of the business ideas to be pursued further in a guided student start-up firm to be founded as a campus company. The course is offered by the university to third-year bachelor students from the Faculty of Economics in close co-operation with external lecturers from business entrepreneurship and the Junior Achievement Slovakia Organisation (<http://www.amcham.sk>).

The course itself is instructed and co-ordinated by an external lecturer who works in an SME in the commodity industry and has been a former employee with TUKE’s Faculty of Economics. Seven of the thirteen sessions on business idea creation and business plan development in the *first part* are taught by the instructor while a further six are taught by external lecturers on specific areas of entrepreneurial management such as finance, HR, and marketing. These external lecturers are from businesses in the Kosice region and commonly have an owner or management position in the functional area they teach. The business ideas developed by students provide the basis for class discussion and support of individual start-up projects grounded on these ideas (e.g. in terms of costing and pricing strategies, sources of funding or

¹³⁰ There seems only to be a further accredited educational course in “Entrepreneurial Competences” within the context of further professional education (Faculty of Economics, 2013, p. 35).

marketing planning). The business ideas themselves are developed in student teams of around five members with different managerial roles.

During the second part of the course, which is continued in the second semester, all ideas will be presented. A group of students will then select one idea to be pursued and turned into a student start-up company. This company will be created in the context of an entrepreneurship programme established and run by the Junior Achievement Slovakia Initiative in co-operation with the National Bank of Slovakia and the Slovakian Ministry of Economics. Within the programme, student companies are set-up in a simulated setting (e.g. in terms of registration with tax authorities and administrative filings). In the second semester, the business plans will have to be frequently refined and thoroughly planned, especially when it comes to actually bringing a product or service to the market, and establishing the company as an organisation. For example, the business idea put into practice in the course in the latest academic year was a card game for travellers which was produced and sold by the students. Commonly, within the entrepreneurship programme of Junior Achievement Slovakia, the student companies will be concluded at the end of the programme; however, TUKE students may continue the business on their own at the end of the course.

Methods

In terms of teaching methods, the *entrepreneurial skills course* (within the Junior Achievement programme) is centred on learning through entrepreneurship, particularly in the second term. Simulated student companies are used to support students' development of specific skills and knowledge on how to establish a start-up in practice within the Slovakian institutional environment and market economy. Practically, the process of business idea generation, evaluation (based on business planning), and implementation (in student companies) is facilitated by team work and presentation sessions.

Since *Enterprise and Entrepreneurship* is a compulsory course for first-year bachelor students in the different bachelor degree programmes at the Faculty of Economics (see 0), it has a quite large audience of approximately 150 students and is mostly taught in a lecture-style format (the course is offered both in Slovak and English). However, other methods are also employed. In the course, student teams have to pick a start-up or young company (ideally in the industrial sector; i.e. a product company) alongside which they analyse and solve typical entrepreneurial management problems and use tools, e.g. from strategic management or financial planning. Application of managerial concepts and tools to the setting of the above entrepreneurial example companies is central. Therefore, theoretical sections are kept relatively concise by the instructor with more room for discussing the implementation of concepts and tools e.g. in case studies, class exercises, or discussion of example video material (e.g. of pitch presentations of business ideas).

Informal evaluation of learning outcomes and feedback for students

In the *entrepreneurial skills course*, the above-mentioned process of refining and further developing the business plans is coached by the instructor of the course. Students receive feedback on their work in moderated team discussions and meetings concerning further preparation of business plan elements and student presentations. Scope for informal feedback is limited in the *Enterprise and Entrepreneurship course* due to the large class size with a more pronounced focus on formal evaluation instruments (see 7.2.4 below).

7.2.4. Setting of entrepreneurship teaching

Timing

Even though the focal *Entrepreneurial Skills course* follows a structured programme (of Junior Achievement Slovakia), the local structure of the offer at TUKE is specific. From the instructor's point of view, it is advisable to run the course in a two-semester format with two consecutive parts. This is because the learning process of developing substantial business ideas, understanding and applying business plans as an evaluation and management tool, and setting up a student company in practice is complex, with a distal outcome at the end of the course. In particular, students will need time for preparing, deepening, and reflecting their work in class and between the sessions, which is why the course has an extended format for contact time over a two-semester period. Contact time is two hours per week with thirteen sessions in the

first semester and eleven sessions in the second semester. Reportedly, the first semester is needed to introduce the business plan tool and discuss specific managerial aspects. The second semester is required for students to work out and refine the many details of their student company based on their initial plans.

Formal evaluation of learning outcomes

The formal evaluation within the course *Development of Entrepreneurial Skills* is based on a mix of aspects. Namely, this is the quality of the business plans submitted by the student teams, students' contributions to and the overall success of the established student company, and a small written examination covering students' understanding of business idea development and business plans. Overall, students receive three credits for the entire course.

In *Enterprise and Entrepreneurship*, students are evaluated on different assignments throughout the course: a) short tests related to concepts of entrepreneurial management, b) course work during the semester (e.g. submission of managerial analysis of students' example companies), and centrally, c) a written end-of-course exam.

7.2.5. Instructors: teachers and mentors

Professors, other employees and external lecturers of the university

Internal and external EE personnel are predominantly employed or contracted by TUKE's Faculty of Economics. In addition, university staff from science and engineering (e.g. within the Faculty of Electrical Engineering and Informatics) are also involved. However, the latter appears to relate mostly to the intersection between technology and business management in general, and only to some extent represents true education in the context of entrepreneurship. With the Economics Faculty, the most important aspect with regard to teaching personnel is that there is no specific tenured chair for entrepreneurship. Nevertheless, there are mid-level and junior faculty members delivering entrepreneurship education together with external lecturers – mainly in courses and additional seminars within the faculty's bachelor study tracks. As reported by the Dean for Education Affairs, the focus of the Faculty of Economics is more on supporting and offering extra-curricular activities in entrepreneurship where members of the faculty engage in coaching students interested in entrepreneurship (e.g. from banking and regional studies; see 7.3.5 and 7.3.6).

"Real entrepreneurs" as teachers

In addition to frequent guest lectures by well-known Slovakian entrepreneurs, e.g. Thomas Bel – the founder of EXIsport and one of Slovakia's *Entrepreneur of the Year* laureates, entrepreneurs and business professionals are integrated continuously in the *entrepreneurial skills course* discussed in 7.2.3 above. Depending on the topics to be discussed in class, either founders of start-ups, entrepreneurial leaders of young enterprises, or business managers teach sessions in a team, along with the co-ordinator of the course. The topics, for example, can range from financing and management accounting or entrepreneurial marketing and advertising. Entrepreneurial management themes like this are centre-stage in the first part of the course, while in the second part, students get coached by the entrepreneurs and the instructor of the course in preparing business plans for their student start-ups.

7.3. Extra-curricular activities related to entrepreneurship education

7.3.1. Overview about extra-curricular entrepreneurship activities

In particular, TUKE offers a range of informal extra-curricular activities in entrepreneurship education. These activities are organised and supported within the university through:

- Individual groups of people like university lecturers, alumni, and students as well as professionals from the university region; e.g. *AZU activities* (an organisation delivering EE to students building their own business ideas and start-ups; www.azu.sk), the *start-up weekend* (<http://kosice.startupweekend.org/>), *Eastcubator* (an incubator for start-ups from Kosice and the region of Eastern Slovakia initiated by TUKE staff members and alumni together with entrepreneurs; <http://www.eastcubator.sk>)

- Particular TUKE institutions and funding programmes such as the university’s Start-up Centre and the Technicom project to establish a science park, which includes resources for academic start-up coaching and support (see 7.3.6 and 7.4.1); e.g. there is a business idea competition called *Present Your Idea* for start-up entrepreneurs from East Slovakia. This is a unique competition of innovative ideas, projects and solutions from various fields of science that have the potential for creating a future start-up (or those that have developed within existing start-ups). The purpose of the competition is to support innovative business ideas, which may result in new high-tech companies and create new job opportunities. The competition is also part of the objectives of the University Science Park Technicom and features around 30 ideas collected in two rounds in spring and autumn across its latest edition.
- Single curricular courses which integrate additional extra-curricular entrepreneurship-related activities like business idea competitions (e.g. (<http://www.podnikatelskynapadroka.sk>; <http://www.nadaciatrabanky.sk/grantovy-program-business-idea>) and entrepreneurial challenges (<http://www.jasr.sk/showdoc.do?docid=3147>; <http://www.jasr.sk/showdoc.do?docid=3385>).

In this case, the activities of AZU (including the related *start-up weekend*) will be presented in detail (see 7.3.3). Start-up coaching for university members within the newly opened TUKE *Start-up Centre* and *Eastcubator* incubator will be addressed below in 7.3.6. For an overview of extra-curricular activities related to entrepreneurship education see also the exhibit below.

Exhibit 4: Overview about extra-curricular EE activities at the University of Kosice

No.	Name	Objectives	Target group	No. of participants in 2013
1	AZU entrepreneurial training programme	Provide training in entrepreneurial self development as well as business idea generation, evaluation, and exploitation in start-up projects	TUKE students from all faculties	NA
2	Start-up Weekend	Prepare real start-ups from students business ideas by student teams; coached by mentors and evaluated by a panel of judges	TUKE students from all faculties	46
3	Eastcubator	East-Slovakian incubator organisation associated with university staff; provide a networking and coaching platform for nascent entrepreneurs	Regional entrepreneurs in East-Slovakia including TUKE students and staff	NA
4	TUKE Start-Up Centre (start-up coaching; training workshops, campus business idea contests; incubation activities)	The Start-up Centre is to collect students’ business ideas, compose start-up project teams, and support and accelerate the start-up process through its coaching and training activities	TUKE students from all, in particular, technical faculties as well as staff and regional entrepreneurs with business ideas	30 to date
5	Various business idea competitions and entrepreneurial challenges	Complementary element of business management and entrepreneurship courses; offering students the opportunity to practice business idea generation and working on entrepreneurial management tasks	TUKE students from all faculties, in particular Faculty of Economics	

7.3.2. Target groups of extra-curricular activities

As noted in 7.3.1 above, extra-curricular activities at TUKE are offered in different contexts by different, yet sometimes overlapping (e.g. AZU and Eastcubator) groups of people. Because of this, there are different target groups addressed by these activities. For example, some of those activities integrated into curricular EE offers (e.g. the business idea competitions) are brought to

and supported specifically for bachelor students from the Faculty of Economics. However, most extra-curricular activities are open to all TUKE students and staff. The coaching offers by TUKE Start-up Centre are open to potential participants from the East-Slovakian region: "It [the TUKE Start-up Centre] is an activity, whose aim is to provide support to innovative and creative people in transforming their ideas into products and services. Technical University of Kosice has the ambition to support participants of the Start-up Centre by offering them the quality professional advice, as well as infrastructure in the form of technical equipment" (UCITT, 2014; www.ucitt.tuke.sk). Some activities are also offered to externals (e.g. nascent entrepreneurs from the Kosice region within the Start-up Centre and Eastcubator coaching services).

7.3.3. Designing extra-curricular activities

Intentions

Similar to the different target groups of extra-curricular activities in 7.3.2 above, the intentions related to these activities appear to differ in detail. Activities within the Start-up Centre or Eastcubator strive to provide know-how for and guide student (or generally participant) action with regard to a specific start-up project. The AZU course activities (see the contents section below) aim to build and improve students' general soft and hard entrepreneurial skills (e.g. to master business presentations and financial venture planning). However, throughout the course programme offered by AZU, the focus also turns to generating individual business ideas and developing them further towards founding a venture (in connection with the start-up weekend event).

Essentially, most extra-curricular offers within the TUKE organisation seem to share the intent to motivate and activate students with regard to opportunities to create specific outputs such as business ideas, business plans or steps to establish a venture. This need and corresponding intention to motivate students to get active through elements of entrepreneurship has been articulated in several interviews (with AZU representatives, the dean for educational affairs as well as with teaching staff from the Faculty of Economics).

Contents

In this section the AZU education programme for TUKE students is presented in detail. The section will also include a brief overview of the Start-up Weekend activity since it is related to the AZU course programme and participating students.

The *AZU education programme* is offered by the AZU organisation (www.azu.sk). It is a student and university alumni-led initiative (together with entrepreneurs) operating at eight Slovakian Universities, including in particular the Technical University of Kosice. AZU Kosice co-operates with TUKE while AZU is funded partly by the Slovakian government and sponsors (e.g. businesses providing resources and sponsoring in kind like coaching budgets or training packages). TUKE provides rooms and technical equipment (the programme and its events are located on campus). Most importantly, university members contribute to running the AZU programmes and serve as instructors and coaches in the training and coaching events of the programme.

The term "AZU" means "activity increases success" ("aktivita zvyšuje uspech"; AZU 2014), which also relates to the particular education course programme offered to TUKE students from all departments (the focus of AZU is predominantly on student education, however, the programme may also be followed by university staff). The prime objective of the programme is to support students in their self-development and creativity with particular regard to activities in entrepreneurship. Generally, as stated by the AZU interviewee, the goal in the context of students' overall university education is to "bring practice to study", which is considered a challenge for higher education in Slovakia. At the level of student learning and action throughout the course, the aims of the AZU programme are for students to create and pursue their own business ideas in a process of problem-based creation of business ideas. An example from the programme at TUKE is Galileo. The start-up rooted from TUKE's Faculty of Electrical Engineering and Informatics and is now located at the TUKE Start-up Centre (UCITT, 2014). Galileo developed a hardware system for audio and video processing for the music and event industry. However, before actually arriving at promising start-ups from university, AZU sees the need to provide an educational programme when working with students on entrepreneurship (see below). Considering that it is impossible to teach people how to build a new business in five

or ten weeks, according to TUKE, “what we do is to show students how to solve some of the problems faced by entrepreneurs”. These entrepreneurial problems or challenges are addressed in a two-part education programme with ten individual sessions. Typically, the sessions have an input or reflection part in the beginning with a practice and discussion element to follow.

The first series of sessions is on improving hands-on practical and soft skills of students in situations relevant to establishing a venture. For example, students learn about and practice:

- Communicating business ideas in pitch presentations and negotiations;
- Gathering information for start-up planning and self-management;
- Setting and attaining entrepreneurial targets and personal goals;
- Managing their time in entrepreneurial projects and overall in their studies;
- Developing their leadership competences.

The second part of the programme is centred on typical tasks and challenges for starting one’s own business, in particular:

- Creation of a business idea based on an envisioned need or problem to be solved through entrepreneurship;
- Market analysis;
- Finance;
- Business planning;
- Entrepreneurial marketing.

In this part, students will develop business ideas between the first and second sessions in teams. In the four sessions to follow, the teams will work on and refine these business ideas to tackle the above-mentioned typical challenges when establishing a start-up venture. Commonly, AZU cooperates with external partners and sponsors, in particular with the Slovakian Union of Young Entrepreneurs but also with consulting firms like KPMG and start-up enterprises who serve as mentors for student teams and as external lecturers in the above sessions. For example, in the session on finance in the programme’s recent edition, students discussed potential crowd-funding sources for their business ideas and developed a profile on the Kickstarter platform. Overall, the entrepreneurial challenges addressed in the second part of the programme are designed to reflect the life cycle of a start-up that has to be established. This also includes the practical goal articulated by AZU to build a bridge for students to the Start-up Weekend at Kosice so as to actually build a business on the basis of their business ideas.

At the Kosice *Start-up Weekend* (<http://kosice.startupweekend.org>), more intensive individual mentoring and planning for actual new business formation takes place, e.g. in generating business models with students, assembling entrepreneurial teams, and taking steps to establish businesses. The Start-up Weekend format itself is an existing non-profit organisation present in more than one-hundred countries in the world. Local organisers from AZU and TUKE set-up a weekend event in 2014 (after a two year intermission) with a number of Slovak national and international partners and sponsors like The SPOT, a Slovakian start-up initiative (www.thespot.sk/), Slovak Telecom, EXISport, and the City of Kosice. Representatives of these partners, including the rector of TUKE, serve as judges during the Kosice Start-up Weekend. The line-up of student mentors consists mostly of young entrepreneurs and people involved in start-up support in Slovakia. In the current event, 54 students participated in the Kosice Start-up Weekend presenting 47 ideas of which twelve ideas moved to the final to be pitched to the panel of judges who selected three winners (e.g. of a resident place in the TUKE Start-up Centre sponsored by the university and a consulting budget sponsored by KPMG). The next Start-up Weekend will be in 2015 and will be organised jointly by AZU, the Start-Up Centre and the Eastcubator.

Informal assessment of learning outcomes and feedback for students

In the main AZU programme, outcomes for students have been assessed during the team work and presentation phases during the course. This has been done in particular by communicating with students with regard to further improvement on personal entrepreneurial skills in the first part, and intensively during the start-up weekend. The latter has not only been in the structured

form of business presentations to an audience of judges, but also during the coaching phase when the business ideas of students have been improved together with the mentors present at the start-up weekend. Vice versa, student feedback from running the AZU programme is used to further adapt the education programme itself, for example towards a stronger focus on assisting students to develop their personal communication and leadership skills.

7.3.4. Setting of extra-curricular activities

Locations

Extra-curricular EE activities take place in different locations, both inside and outside the university. For the AZU activities, the organisation arranges rooms with the university to host events (e.g. in the new lecture theatre in the university library). The coaching activities in the context of individual and student team start-up projects is done in seminar rooms and individual offices within the Start-up Centre or within the co-working space at the Eastcubator.

Timing

The focal AZU programme runs over two terms with ten sessions of around 90 minutes each. This time frame seems to be preferred over a shorter runtime of the programme since students: a) are first supported in improving their personal skills, which are also needed for the second part (e.g. in terms of presenting business ideas and work on business planning in teams) and, b) require time to build and further develop their initial business ideas in the second part. The Start-up Weekend which follows the programme is offered in a compact three-day format allowing working with motivated groups of students on putting their pre-developed business ideas into practice together with mentors and judges all in one place at the same time (which would likely be more difficult to organise in a format where meetings with mentors and judges are stretched over a longer period of time).

7.3.5. Persons involved in extra-curricular activities

In view of the different organisers of extra-curricular activities, there are a range of diverse persons involved in these activities. Within TUKE, staff members (e.g. assistant professors) from economics and also from science and engineering, participate in extra-curricular EE; for example, Viliam Vajda, Assistant Professor from the Department of Banking and Investment co-manages the Eastcubator incubator, teaches entrepreneurial finance in the AZU education programme and – together with Peter Dzubka from the Regional Sciences and Management (and others) – coaches university start-up teams within the TUKE Start-up Centre. In addition, there are current students and alumni active in the AZU organisation taking on parts of the teaching in the programme in Entrepreneurial Management. In terms of external persons, particularly business professionals and entrepreneurs are involved in different contexts. Most importantly, the AZU education programme integrates entrepreneurs from the Slovakian Union of Young Entrepreneurs who act as mentors providing support to student start-up teams in the programme. AZU considers the access to internationally successful Slovakian entrepreneurs as an important motivating factor for students to get actively involved in entrepreneurship themselves. In addition, there are other persons engaged in more specific individual activities, such as acting as co-ordinators of external events like business idea competitions, or acting as judges in entrepreneurship-related contests. These individual activities include, however, only minor teaching roles but are important in terms of providing feedback for the business ideas and start-up plans of students.

7.3.6. Management of extra-curricular activities

This section presents activities of the TUKE Start-up Centre (and, briefly, the Eastcubator incubator organisation) in serving potential student entrepreneurs or entrepreneurial teams from TUKE and their venture projects (managing student support).

Managing student support

The central institution on campus that supports business ideas and potential venture projects of TUKE students (and partly also alumni and staff) is the *TUKE Start-up Centre* (Startup Centrum;

<http://startupcentrum.tuke.sk>). The centre is domiciled within the building of the university's Centre of Technological Innovation and integrated into the management and administration of the UCITT (TUKE's University Centre for Innovation, Technology Transfer, and Intellectual Property Protection). The Start-up Centre has been established since spring 2014 as a part of the Technicom project. The project was pursued by the university to build a science park that would serve technology transfer and technological entrepreneurship rooting from TUKE institutes and laboratories (see 7.4.1 below).

In contrast, the Start-Up Centre itself has been established with the idea of a one-stop shop to support start-up projects from TUKE students and entrepreneurs from the Kosice region with the general aim "to provide support to innovative and creative people in transforming their ideas into products and services" (UCITT, 2014). The university has set up a process of collecting and screening potential start-up projects in a prospective bi-annual business idea contest. Start-up entrepreneurs and their teams can stay at the centre for an initial period of six months (as agreed by the university) after which a business plan has to be presented as a prerequisite for a continued residence at the centre. In addition to office, ICT, and laboratory infrastructure, the centre offers individual (business) coaching and education workshops for resident entrepreneurs and student start-up teams to take part in the initiated business idea contests. Currently, there is a group of core coaches and educators in the centre (Branislav Bonk, Peter Dzapka, Frantisek Jakab, Marek Lavcak, Viliam Vajda, and Peter Vrabel) who are also involved in other entrepreneurship education activities at TUKE. In addition, entrepreneurs receive further legal and technological advice and support from TUKE faculties depending on the nature of their business idea (this further support is organised by UCITT). Externally, the Start-up Centre co-operates with the Kosice IT Valley, IT Association of Slovakia, KPMG and other consulting companies and is expected to be supported by the new Slovak Business Agency as a public funding organisation for start-up activities in Slovakia.

In addition, there is a new incubator institution – the Eastcubator (www.eastcubator.sk) – established by entrepreneurship enthusiasts from the university (Marek Lavcak, Viliam Vajda and Peter Vrabel) and external entrepreneurs from the Kosice region. The Eastcubator has been set up as an incubator for nascent venturing projects functioning as a close co-operation partner to the Start-up Centre and the Technicom inside the university. It offers a second opportunity for co-operation partners to engage with start-up projects from TUKE and the Kosice respectively East-Slovakian region. The Eastcubator is located between the university and the city-centre of Kosice offering a co-working space for start-ups and acting as a bridge to potential start-up partners like investors or technology providers. Also, an educational programme in the form of workshops is planned (the Eastcubator has just opened in October 2014). This is based on the business model canvas as a framework instrument to facilitate the development of business plans for the venture projects that may then be pitched to potential investors. The Eastcubator is to partner with TUKE and the Kosice IT Valley, the SPOT, and KPMG to support start-ups concerning their coaching and networking needs (similar to the AZU education concept).

Internal and external network management

Co-operation across the different actors involved in extra-curricular EE at TUKE flows mostly ad-hoc between the persons engaging in and leading these extra-curricular activities. This is accompanied by institutional co-operation which will be further developed in the future since some of the institutions, e.g. the TUKE Start-up Centre and the Eastcubator, have only been established recently in 2014. Personal co-operation particularly stems from the fact that the same people are dedicated to central EE activities – for example, teaching on the AZU programme, coaching start-up teams in the Start-Up Centre and managing the establishment of the Eastcubator. Also, the institutions have initiated co-operation, e.g. in organising joint workshops for start-up teams or providing consulting offers in technology venturing projects where expertise in engineering and science from TUKE is needed.

7.4. Institutional aspects of entrepreneurship education

7.4.1. Organisational set-up and change

Measures for coordinating and integrating EE across the university

As is fairly typical for university organisations in general, and also at TUKE, co-operation and integration between faculties, respectively departments, seems to be a challenge at times. This is anchored at least to some extent in Slovakian higher education law and corresponding formal structures of university organisations. Essentially, university faculties used to be (and still are) independent bodies. In particular with regard to entrepreneurship and entrepreneurship education, formally the faculties hold accreditations for study programmes (in terms of education content) as well as the resource infrastructure incorporated in entrepreneurship chairs, centres, and departmental research institutes. Also, entrepreneurship, its education, and general technology transfer as distinct activities of HEIs have traditionally not been on the policy agenda of TUKE, which has for a long time been more focused on education and selected fields of research with only occasional industry collaboration as a platform for entrepreneurship and technology transfer.

However, this is considered to be slowly changing by most interviewees¹³¹, and there are today notable elements of bottom-up emergence and top-down implementation and support of entrepreneurship and entrepreneurship education. Asked for the drivers of this, interviewees expressed four potential catalysts, in particular for the future diffusion of entrepreneurship at the Technical University of Kosice:

- The bottom-up engagement of individual university members who initiate and support activities like the AZU education programme, the Eastcubator, or the start-up coaching activities in the Start-up Centre;
- The attractiveness of entrepreneurship as an element of student education with departments willing to take entrepreneurship on board, in particular in engineering and science faculties where the entrepreneurship theme contributes to attracting students to study programmes in competition with other HEIs in Slovakia;
- The top-down impulse from university-wide third-party funded projects, in particular the EU and the Slovakian Government, e.g. the infrastructure for the TUKE Start-Up Centre (see 7.3.6) and the Science Park "Technicom" project (see below) and;
- The demand-pull from external stakeholders, like industry, to establish platforms for collaboration, such as a science park or business accelerator.

The university's overall support of bottom-up activities like AZU is mostly in terms of infrastructure (e.g. in the form of rooms, office space, IT equipment), partial funding, and ad-hoc participation in events (like the Start-up Weekend). However, the management of the university also initiated entrepreneurship activities top-down, mainly in the context of technology transfer, most notably the Start-Up Centre and the science park.

The *Science Park Technicom* (www.technicom.tuke.sk) is in project stage with results to be expected soon. The infrastructure for the science park is currently being built, and the opening is planned around July 2015. In establishing the science park, which is structured as a pre-incubator and high-tech incubator, the university cooperates with Pavol Jozef Safarik University (Kosice) and the University of Presov (UCITT, 2014a). At TUKE, the Technicom is established under the roof of UCITT, the central University Centre for Innovation, Technology Transfer and Intellectual Property Protection. The Technicom concept is created around the following scientific areas (UVP Technicom, 2014, 1):

- Information and communication technologies;
- Electrical engineering, automation and control systems;
- Mechanical engineering;
- Civil engineering;

¹³¹ In interviews where the issue of organisational change towards entrepreneurship and co-operation across faculties has been discussed.

- Environmental engineering (mining, metallurgy, water management systems) where the R&D solutions also take into account the corresponding social and human dimensions.

In these areas, currently there are more than thirty applied research and innovation pilot projects in the pipeline which provide the basis for product development and potential ventures when the park commences its operations. The core idea is to use the strengths of TUKE research and support individual scientific entrepreneurs or entrepreneurial teams. Support activities have two elements, administrative and legal support (e.g. patent protection) as well as infrastructure and coaching support (e.g. lab space, start-up coaching). Corresponding to the Technicom, UCITT has set up the Start-up Centre not only to support technology transfer and venturing at the level of university departments and employed university scientists, but also to encourage student and graduate entrepreneurship from science as well as regional entrepreneurship.

Overall, the university's campus-wide activities in EE appear to be mainly indirectly on an extra-curricular basis. I.e., while not setting up entrepreneurship courses or programmes immediately (this belongs to the individual faculties and departments), the management of TUKE will increasingly encourage individual start-up coaching and mentoring through organisational units like the Technicom and Start-up Centre. However, the depth and (financial) sustainability of these initiatives still appears to be challenging (as reported by the interviewees from UCITT; see next section on managing resource acquisition).

Managing the acquisition of resources

As is often the case with novel activities in supporting entrepreneurship and entrepreneurship education outside the established curriculum, such initiatives are kicked-off on a project-basis with an initially fixed time horizon of funding. This also holds for the university's main Technicom project and partially, also for the Start-up Centre. The university has contributed to the establishment of both (in particular, terms of co-funding) and the units are planned to be established and respectively continued, for the long-term. The Technicom project is funded by the Slovakian Government and the European Regional Development Fund ("University Science Park TECHNICOM for innovative applications supported by knowledge technologies"; USP TECHNICOM). Funding, including the co-funding provided by the universities involved, totals around 40 million Euro (UVP Technicom, 2014). Funding is provided until the first half of 2015 covering the initial infrastructure establishment of the science park. Running operations thereafter still have to be financed. The long-term idea is to fund the Park from revenues from the Park itself and governmental support for a platform for transferring technologies and innovation. However, according to UCITT, this will take time. This also implies that long-term sustainability will still be an issue for the extra-curricular EE activities in terms of individual and group start-up coaching to be provided within the Technicom. For other extra-curricular activities, albeit at a smaller scale, this is also important since individual activities like the Start-Up Weekend or the AZU programme depend on external sponsors, typically for individual elements of education formats, like free mentors for student teams, presentation events or business competitions and additional government grants.

7.4.2. Laws, statutes and codes

In terms of incentives for university faculty to engage in EE within TUKE's institutional environment, teaching staff involved in EE has a substantial teaching load also outside EE courses themselves, e.g. in terms of teaching general management and economics modules across various programmes (exceeding ten hours per week at the assistant professor level). As such, offering additional EE (e.g. coaching student teams in entrepreneurship contexts or offering additional practical courses) has substantial opportunity costs in terms of other lecturing duties and research obligations. Working on extra-curricular activities initiated by individual actors within the university (namely the AZU programme and the Eastcubator) is currently still on a small salary, essentially on a "pro bono" basis. However, the university, in particular the Faculty of Economics, considers the work of faculty staff to teach and coach student entrepreneurs as important and permits such additional consulting work beyond regular job duties.

7.4.3. Mindsets and attitudes

Raising awareness for the importance of entrepreneurship

Entrepreneurship at TUKE may not yet benefit from a long-term tradition and publicity within Slovakian institutions of higher education. However, actors within the university organisation cooperate with Slovak national institutions which promote entrepreneurship in Slovakia like The Spot, Junior Achievement Slovakia, and others (see 7.2.3, 7.3.3). Within TUKE itself, the need to raise awareness for entrepreneurship in general and the EE offers existing on campus in particular, has been recognised. For example, within the Start-up Centre, the bi-annual campus-wide (and regional) business idea contest has been established instead of a passive “wait-and-see strategy”. The business idea contest aims to actively develop business ideas with student teams and regional start-up entrepreneurs. The AZU programme deliberately starts with a series of events which focus on students’ self development and personal management (see 7.3.3) and then a bridge to the entrepreneurial development of business ideas is built. This seems to be a useful strategy to market the EE programme of AZU since the development of personal communication, negotiation, and leadership competences is highly relevant to the target group and it attracts students to join the course. The adjacent Start-up Weekend, to which some of the students of the AZU programme move on to continue, is deliberately also open to all TUKE students who have not participated in the AZU course so as to make the Start-up Weekend an event for the whole university.

Encouraging entrepreneurial behaviour

While compulsory curricular EE follows the aim to first familiarise first-year bachelor students with entrepreneurship, there are further courses and extra-curricular activities directly related to supporting entrepreneurial behaviour amongst students. The key objective of the AZU programme is to provide opportunities for students to create their own business and have a practical programme (including the Start-up Weekend) supporting the process of preparing a business start-up on the basis of these business ideas. Also, individual and group coaching activities within the TUKE Start-up Centre are directed at building and supporting student start-up projects (e.g. in workshops where student teams meet to further develop their business ideas, guided by TUKE teaching staff (see 7.3.6). While the Start-up Centre targets mainly student entrepreneurs, the infrastructure of the Technicom Science Park will also serve university staff involved in entrepreneurship teaching.

Within the curricular entrepreneurial skills course discussed in section 7.2.3 above, the participants of the course may continue their student firm projects. However, the course coordinator considers financing the business activity to be the most significant challenge for student entrepreneurs and the university, of which the latter is not yet in the position to provide outright funding for start-up projects because of legal restrictions. There are also other *barriers* towards student entrepreneurship which have been put forth in the interviews. Traditionally, in higher education in Slovakia there seems to be a prevailing preference towards top-down teaching of knowledge rather than encouraging student activities. Interviewees also expressed the view that, correspondingly, there is occasionally also a lack of motivation within the body of students to engage in (demanding) entrepreneurship activities.

7.5. External relationships related to entrepreneurship education

7.5.1. Types of relationships with external stakeholders

TUKE co-operates with a range of stakeholders involved in its entrepreneurship education activities (see the exhibit below).

Exhibit 5: Overview about major external stakeholders involved in EE at TUKE

No.	Stakeholder	Type of involvement in EE
1	Junior Achievement Slovakia	Organises student firm concept within the course “Development of Entrepreneurial Skills” at TUKE; provides lecturing support and platform for business idea competition as a component of the course
2	Slovakian Union of Young Entrepreneurs	Representatives, in particular entrepreneurs, lecturing

		in the AZU programme on Entrepreneurial Management; acting as mentors for student start-up teams
3	KPMG	Sponsors consulting budgets for student start-ups; acts as coach for start-up projects (AZU programme and start-up weekend)
4	The SPOT	Representatives of the start-up support initiative act as mentors in start-up weekend
5	EXISport; Thomas Bel (founder)	Guest lecturer in entrepreneurship; judge in Start-up Weekend
6	Various regional technology and banking companies; Kosice IT Valley Organisation	Organisers of business idea/ plan competitions integrated in entrepreneurship education at TUKE; partners in ad-hoc support of start-up projects in the TUKE Start-up Centre and Eastcubator

7.5.2. External stakeholders involved in entrepreneurship education

Role of external stakeholders in entrepreneurship teaching activities

The involvement of external stakeholders occurs in different ways, such as interacting with the university and its members on different frequencies yet on an ongoing basis in terms of engagement in teaching entrepreneurship, coaching student start-up teams and providing platforms and conceptual support for different events. For the university, these partners are essential for enabling to offer (extra-) curricular entrepreneurship activities for students in general, and for offering paths to practical entrepreneurship and business in particular (e.g. with young entrepreneurs as role models, practical insights by business and entrepreneurship professionals in events and coaching activities). National Slovakian institutions which support new venture creation also seem to be important, given that they provide a country-wide support network and central knowledge hub for entrepreneurship which is still a comparatively new topic within Slovakian higher education.

Influence of external stakeholders in the entrepreneurship education

The involvement of external stakeholders as sponsors (in particular sponsoring like consulting budgets as in AZU or mentoring/ judging in business idea competitions) also indirectly shapes the delivery of (extra-curricular) EE to some extent. In addition, the demands of external stakeholders have occasionally also contributed to university initiatives (e.g. the idea of a science park has to some extent come about on demands from industry). However, such pull effects from industry sectors around a technical university like TUKE appear to affect mainly the university's policies towards technology transfer (e.g. efforts to attract certain multinational enterprises to take part in the Technicom Science Park to accumulate foreign direct investment for the Kosice region) rather than entrepreneurship education in particular.

7.6. Impact and lessons learned

7.6.1. Evaluating impacts of the entrepreneurship education approach

Beyond standard forms of evaluating the learning outcomes of students (such as exams or reports), additional informal feedback evaluation instruments are employed in different EE activities at TUKE. In the "Development of Entrepreneurial Skills" course the quality of students' start-up projects and corresponding business planning efforts are evaluated both in the course by the instructor and externally when participating in the business plan competition within the format provided by the Junior Achievement Slovakia programme. A panel of external judges also evaluates the work of student start-up teams in the Start-up Weekend activity.

The Start-up Centre collects and monitors existing business ideas on campus in its bi-annual "Present Your Idea" competition. However, since the initiative is still fairly new, further instruments related to evaluating the impact of university start-up formation will have to be developed in the future.

7.6.2. Lessons learned

Summary of lessons learned from this case

The characteristic of entrepreneurship and entrepreneurship education at the Technical University of Kosice which sticks out is the more significant emphasis on extra-curricular EE activities in co-operation with external stakeholders. This may have two interesting implications – in terms of both advantages and disadvantages or challenges to be learned from:

- Initiation, flexibility and experimentation in crafting and showcasing EE offers for future expansion of EE at the university;
- Co-ordination and sustainability of the set of education activities and long-term institutionalisation of EE within the university organisation.

In the case of the first point, TUKE started to engage in entrepreneurship with a comparatively small base of resources (in terms of staff) specifically dedicated to internal, especially curricular, EE activities focussing on students' hands-on learning of business idea development and entrepreneurial management skills (see, e.g., the *Development of Entrepreneurial Skills* course in 7.2). At the same time, a range of different extra-curricular EE activities have emerged within the university (see 7.3). These activities frequently involve partnering with external stakeholders like entrepreneurs from the Kosice region, companies, initiatives (e.g. within the European Capital of Culture Kosice movement) and organisations who coach and support start-ups in Slovakia (see 7.5). Often these activities have been initiated at the outset or have later been supported by individual university members, for example the *AZU programme* including the *Start-up Weekend*, the novel *Eastcubator*, or the *TUKE Start-up Centre*. Firstly, this enables TUKE to establish entrepreneurship activities within its organisation with engaged and motivated individual university members (university staff; alumni; students) backing these education activities. Secondly, operating EE on such a bottom-up or grass-roots basis allows the university to experiment with single activities or instruments of entrepreneurship education and to find out what works and what does not. For example, in terms of attractiveness for the target group of TUKE students or regarding a suitable organisational set-up of entrepreneurship institutions like the TUKE Start-up Centre, the Eastcubator or the *Technicom Science Park*. This has been considered important by case interviewees in particular in terms of providing a neutral platform for entrepreneurship outside individual university faculties or even outside campus (in case of the Eastcubator).

This trial path of flexibly identifying feasible structures for and instruments of EE within the organisation may in turn allow the formation of showcases of successful forms of entrepreneurship education and raise additional resources to expand these activities. Such resources may root from state support of entrepreneurship and new business creation, external stakeholders from society (e.g. in public-private partnerships), or from the university's management itself. Here, the focus on extra-curricular EE providing students and other university members with opportunities to create business ideas and concrete start-up projects as actual entrepreneurial outputs may be an advantage in a process of initial showcasing and further expansion in building the EE infrastructure of TUKE.

Regarding the second point, such a flexible grass-roots type build-up of EE within a university organisation is obviously a double-edged approach, which also brings about challenges in ensuring co-ordination and organisational sustainability. Since EE activities are operated by different individual entities and with external co-operation partners, there is a requirement to have an overarching umbrella strategy for entrepreneurship education rather than a patchwork set of different, unrelated or competing activities, which may even undermine the organisational acceptance of EE. At TUKE itself, co-ordination and communication currently flows across the key people involved in the different activities facilitating shared resource use, collective events, and knowledge exchange.

Personal trust and communication is an effective means of intra-organisational co-operation between the EE activities backed by a group of key actors inside and outside the university organisation. However, while banking on a set of key people to get EE established, it is also essential to keep an eye on overall organisational sustainability over time. With regard to this, fostering further institutionalisation by the university and its management as a whole may well be instrumental towards a long-term establishment of a differentiated EE infrastructure. This EE infrastructure should not depend on whether a set of individual university members commit to

engaging in entrepreneurship or not. Such institutionalisation may come in the form of tenured research and teaching positions in entrepreneurship, the establishment of an entrepreneurship centre, or the founding of formal partnering institutions with the region (e.g. with industry).

Transferability to other universities

The case of the Technical University of Kosice entails a path for transferability particularly for those universities and higher education organisations which are in their initial stage of development of an entrepreneurship education infrastructure. The route to initiate and grow activities in entrepreneurship education outside an accredited curriculum offers a chance for a rapid and individual set-up of activities, such as entrepreneurship training modules, start-up camps or weekends and local incubators offering individual start-up coaching to campus entrepreneurs. Activities may be offered based on the initiative of organisation members (e.g. teaching staff or groups of students) who are interested in entrepreneurship and are motivated to take action without much resource support by the university itself. University management will need to cultivate such initiatives taken by university members and be open for co-operation with external stakeholders, which the Technical University of Kosice already does. Often such activities may be established taking on board the know-how and experience of external partners to bring established formats of entrepreneurship activities and supportive elements to one's own campus.

However, such an "emergent strategy" of individual initiative paired with contributions of external partners needs to be managed carefully for it to be a part of the long-term establishment of entrepreneurship at a university. In the end, the task boils down to navigating the development of an EE infrastructure alongside the two sides of the coin of *institutionalisation*. On one hand, higher education institutes concentrating on extra-curricular entrepreneurship activities can start with small, straightforward resource and human capital bases. These should be based around a group of motivated internal people keen to engage in entrepreneurship by integrating established EE formats already offered by others (e.g. organisers of start-up weekends and business idea or plan competitions, national start-up coaching initiatives, or networks of young entrepreneurs). Such a flexible path to build entrepreneurship education generates benefits because it does not involve substantial institutionalisation (e.g. setting up a centralised entrepreneurship unit or putting individual entrepreneurship activities into a format of accredited modules of study run by faculty staff). On the other hand, higher education institutes will need to supplement the grass-root emergence of individual entrepreneurship education activities with external partners by further institutionalisation. This will ensure long-term sustainability, consistence, and independence of the core parts of an infrastructure of entrepreneurship education from single organisation members and external partnerships.

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8. Kozminski University, Poland: Developing minds for ambitious entrepreneurship and training teachers at other universities

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Abstract



Kozminski University (KU) is a Polish private business and law school established in 1993. It has 5,300 students and a leading position in management education in Poland as well as Central and Eastern Europe. KU offers curricular entrepreneurship education for Bachelor, Master and PhD degrees. Most offers are for BA students in Management with a Major in Entrepreneurship. While KU had been offering entrepreneurship courses since its early years, since 2004 the University has embarked on promoting ambitious entrepreneurship among students. This proved to be a fruitful direction but necessitated reshaping minds and attitudes of students and teachers, shifting their focus away from small-scale establishments to business ventures with growth ambitions. Such a shift turned out to be challenging: the pool of students with the right mindset for ambitious entrepreneurship was so far found to be limited at KU itself. However, KU established links with students from other universities in the region and country and from non-business academic disciplines in extra-curricular activities. In these activities it was particularly fruitful for the quality of business projects to mix students from various disciplines like business management, engineering, agriculture and arts. KU also initiated a programme for training entrepreneurship lecturers from other higher education institutions who in turn introduced entrepreneurship courses in 40 non-business universities in Poland. KU's experiences in entrepreneurship education and lessons learned may be particularly relevant for "catching up" higher education institutions with limited prior experience in teaching entrepreneurship. It may be important for the transferability of such experiences that a substantial part of teaching materials is already available in written form.

Case study fact sheet

<i>Full name of the university and location:</i>	<i>Akademia Leona Koźmińskiego (Kozminski University)</i>
<i>Legal status:</i>	<i>Private higher education institution</i>
<i>Location:</i>	<i>Warsaw, Poland</i>
<i>Year of foundation:</i>	<i>1993</i>
<i>Number of students:</i>	<i>5,300</i>
<i>Number of employees:</i>	<i>Total 361, of which teaching and research staff: 211, administrative staff: 150.</i>
<i>Budget in most recent financial year:</i>	<i>66.8 mln PLN (15.9 mln euro 57. mln PLN (13.8 mln Euro) Financial year ending 30.09.2013</i>
<i>Academic profile:</i>	<i>Business and law school</i>
<i>Entrepreneurial profile:</i>	<i>Developing skills and attitudes of students towards ambitious forms of entrepreneurship. Disseminating know-how in teaching entrepreneurship among non-business HEIs in Poland. Initiating programmes supporting ambitious entrepreneurship in the Mazovia Region and Warsaw Metropolitan Area.</i>
<i>Activities focused in this case study:</i>	<i>Developing minds for ambitious entrepreneurship and interactions with other higher education institutions</i>
<i>Case contact person(s):</i>	<i>Prof. Jerzy Cieślak, Kozminski University</i>

Information included in this case study is from end of year 2014 unless stated differently.

8.1. The university's entrepreneurial profile

8.1.1. The university's overall approach to entrepreneurship education

Key characteristics of EE at Kozminski University

The "entrepreneurial orientation" of Kozminski University (KU) is deeply rooted in its history. The university was established in Warsaw in 1993 as part of an entrepreneurial revolution in the higher education system in Poland. After the collapse of the communist system in 1989, over 350 private HEIs have been established in addition to an existing, approximately 100, public universities. KU has been offering courses about entrepreneurship since its early years. The Chair of Entrepreneurship exists since the inception of Kozminski University. KU has two specialties in entrepreneurship education (EE): firstly, focusing on ambitious entrepreneurship rather than small business. KU shifted to this focus in 2004. Secondly, KU extends this focus also to other universities in the Warsaw region, and KU plays a key role in training entrepreneurship teachers all over Poland.

Publicity of the Kozminski case

The case of EE at Kozminski University (KU) is well-known in Poland, particularly through KU's outreach to other universities. It may also be known in other Eastern European countries. However, Kozminski University has not yet received considerable attention in Western Europe. This is changing gradually as a result of a policy to obtain international accreditations. At the end of 2014, Kozminski University was listed among those universities worldwide which obtained the three most prestigious accreditations:¹³²

8.1.2. Leadership and governance

Importance of government strategies

Although being a private institution, governmental strategies had profound impact on KU's operations and also on EE. Responding to governmental requirements, KU broadened its teaching and outreach programmes to be more strongly related to research and publications in international journals. This also applied to EE.

Importance of EE in the university's strategy

The new university was initially registered under the name Academy of Management and Entrepreneurship which reflected an orientation on training both managers of large corporations and entrepreneurs. Later the university changed its name to Kozminski University (Akademia Leona Koźmińskiego) to give credit to its patron and late Professor Leon Koźmiński but also to reflect a broader scope of education offers including sociology, psychology and law.

Entrepreneurship is deeply rooted in the university's culture. Although it is not specifically mentioned in the KU's mission statement, entrepreneurship is crucial in the implementation of four of six strategic programmes implemented during 2011 – 2016:

- Strengthening the position in academic **research**: Entrepreneurship and innovation has been identified as a research field where KU has a good chance to narrow the distance to leading academic institutions worldwide.
- Internationalisation and worldwide **brand reception**: KU has been recognised as a leader in entrepreneurship education in Poland, participating in various pan-European initiatives. This contributes to the international recognition of KU's brand.
- High level of **student satisfaction**: The surveys on KU students' entrepreneurial background and attitudes (most recently from 2013) showed that 50% either have family business roots or run their own firm. Therefore, for KU students it is important to obtain not only basic techniques of new venture creation but also practical knowledge on how to grow existing firms.

¹³² From AACSB, the Association to Advance Collegiate Schools of Business, based in Tampa, Florida, US; AMBA, the Association of MBAs, based in London; and EQUIS, European Quality Improvement System, based in Brussels.

- Development of long-term **relationships with industry** and community: Polish higher education institutions are generally criticised for their weak ties with the business sector. By establishing such links with entrepreneurs in the Mazovia Region a region in mid-north-eastern Poland with Warsaw as its centre, KU seeks to stand at the forefront of positive changes in that respect.

Extent of high level commitment to implementing entrepreneurship education

The generally favourable attitude of university leadership towards entrepreneurship is reflected in an interview given by KU rector Prof. Witold Bielecki on the occasion of ending the project “Warsaw, the Capital of Ambitious Business” (2009 – 2011): “Entrepreneurs are people who climb the hill. But after reaching the top they quickly get bored and look for another challenge. They are addicted to continuously climbing up. The role of KU is to teach our students the techniques of climbing up, particularly when the slope is steep.” Bielecki specialises in information supplies and operations management, and published a book and several articles on the application of internet-based simulation games in teaching entrepreneurship.

Level of faculties’ and units’ autonomy to act and organisational implementation

Teaching, research and extra-curricular activities in the field of entrepreneurship are subject to laws and regulations issued by the Ministry of Science and Higher Education of Poland, as well as the statute and detailed regulations of the Senate and the Rector of KU. Within this framework, the KU’s faculty has substantial autonomy in designing entrepreneurship courses and conducting extra-curricular activities.

8.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

The core staff involved in entrepreneurship education at Kozminski University is composed of six experts with diverse backgrounds. Occasionally, lecturers from other departments are invited to run specialist courses. At the same time, practitioners are often invited as guest speakers.

Financial resources for entrepreneurship education

The delivery of the core entrepreneurship curricula is covered within the general budget of KU. Basic coaching of KU students is also undertaken by the lecturers without additional pay. When it comes to specialised training and mentoring, the entrepreneurship team is expected to demonstrate an entrepreneurial approach in seeking additional funding. During 2007 – 2014, the most important sources were EU structural funds, grants from the Ministry of Science and Higher Education, and the Polish National Science Foundation.

8.2. Entrepreneurship in curricula and teaching

8.2.1. Overview about curricular offers

The key target group in entrepreneurship education at KU are **Bachelor** of Arts (BA) students in Management who opted for a Major in Entrepreneurship. The majority of courses listed in Exhibit 1-1 are primarily offered to that group. However, many courses which are compulsory for BA Entrepreneurship Major students are also offered as electives for other BA, as well as Master of Arts (MA) students. At the **MA level** there are dedicated courses which attempt to address the interests of MA students specialising in various aspects of management, finance, economics, and administration. There is one general course for MA students dealing with macroeconomic aspects of entrepreneurship.

At **PhD level** the entrepreneurship offer includes two courses. One deals with methodological issues in researching about entrepreneurship. The second is a dedicated workshop during which students learn how to use tools and approaches developed in the field of entrepreneurship, which would make working on their PhD thesis more efficient.

Exhibit 8-1: Overview about prominent curricular EE offers at Kozminski University

No.	Name, degree	Objectives	Target groups	Offered	No. of
-----	--------------	------------	---------------	---------	--------

				since [year]	participants in 2013/14
Bachelor level					
1	Principles of Entrepreneurship (BA)	Introducing core concept of entrepreneurship	All BA students in Management	2013	310
2	New Venture Creation (BA)	Introduction to starting own business	ENT Major* students	1995	110
3	Family Business Development (BA)	Introductory course on family business	ENT Major students	2003	110
4	Project Workshop on Family Business Development (BA)	Dedicated programme for students with family business roots	ENT Major students	2012	10
5	Regional and Local Dimensions of Entrepreneurship (BA)	Understanding local dimensions of entrepreneurship and links between entrepreneurial community and local administration	ENT Major students	2007	30
6	Entrepreneurial Networks (BA)	Exploring the networking potential for small firms	ENT Major students	2007	30
7	Sociology in Entrepreneurship (BA)	Specialized course focusing on sociological aspects of entrepreneurship	MA students (Specialization Sociology in Management)	2011	35
Master level					
8	New Venture Financing (BA, MA)	Identifying sources of finance for start-ups	ENT Major as well as MA students in Management and Finance	2000	40
9	International Entrepreneurship (BA, MA)	Preparing prospective entrepreneurs for going international	ENT Major as well as MA students in Management and Economics	2005	80
10	Internet-based Entrepreneurship (BA, MA)	Focus on small firms relying on Internet technologies	ENT Major as well as MA students in Management	2007	40
11	Entrepreneurial Marketing (BA, MA)	Focus on marketing techniques in young and small firms	ENT Major as well as MA students in Management	2008	40
12	Creativity and Innovativeness (BA, MA)	Workshop aimed at developing creative thinking in business	ENT Major as well as MA students in Management	2008	110
13	Entrepreneurship and New Venture Development (MA)	Basis entrepreneurship course MA level	MA students in Management who did not attend entrepreneurship courses at BA level.	1998	40
14	Entrepreneurship and Economic Development (MA)	Basic macroeconomic course on the role of entrepreneurship in economic development	MA students in Management and Economics	2011	120
15	Entrepreneur and Entrepreneurship (MA)	Introductory course on entrepreneurship	MA students in Administration	2009	20
16	Small Enterprise Consulting (MA)	Focusing on building consulting skills for small business	MA students in Management (Specialisation)	2009	20

Doctoral level			Management Consulting)		
17	Researching Entrepreneurship (PhD)	Presenting research methods and sources of data while researching small firms	PhD students in Management and Economics	2010	25
18	PhD as an Entrepreneurial Project (PhD)	Dedicated workshop on improving of writing PhD thesis with entrepreneurship tools and approaches.	PhD students in Management and Economics	2010	25

* ENT Major – BA students in Management with Major in Entrepreneurship

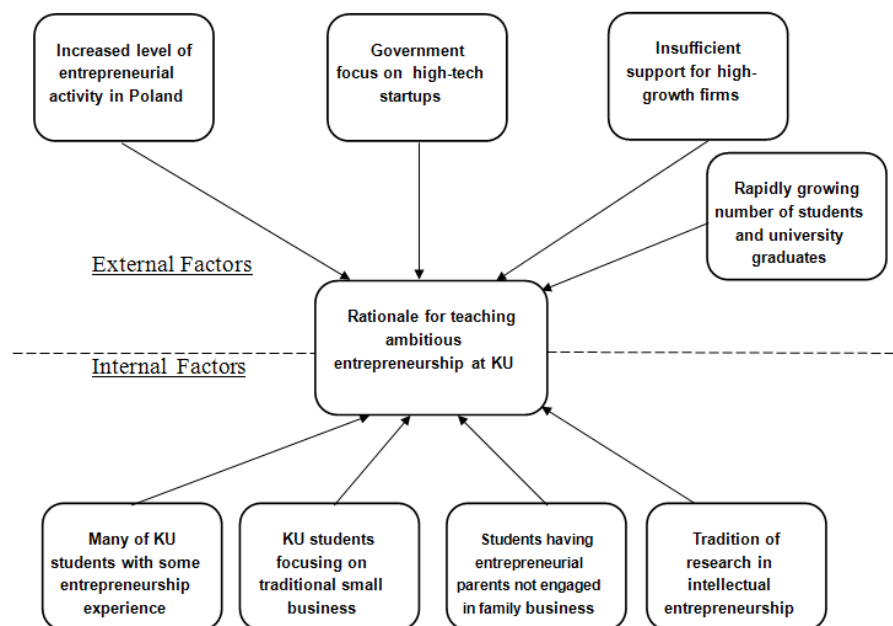
Source: Kozminski University

8.2.2. Origins and operationalisation of teaching ambitious entrepreneurship at KU

External and internal environment

The decision to extend entrepreneurship programmes for KU students to a particular focus on ambitious business undertakings was the result of both external and internal factors, as shown in Exhibit 1-2. They are elaborated in the following descriptions.

Exhibit 8-2: Factors leading to KU's specialisation in ambitious entrepreneurship



Source: Kozminski University

External factors

With regard to external factors, there was an unprecedented **growth of entrepreneurial activities in Poland after 1989** as a result of transition from the centrally planned to the market economy system. Between 1989 and 2008, the number of active business establishments increased three-fold. Consequently, the ratio of business owners as a percent of labour force has reached the levels of countries like Germany and France (Cieślak and van Stel, 2014).

In recent years, awareness grew among the research community and policymakers that their focus should be shifted from increasing the number of start-ups to **expanding the quality component of the Polish business sector**. At the same time, there is a discussion about moving various support measures from the central to the regional or even local level. It also became clear that the traditional dichotomy of small business versus high-tech start-ups is not sufficient as it neglects a very important category of ambitious entrepreneurs who, although not necessarily depending on high profile innovations, strive for rapid growth of turnover, employment and profits. After Poland's accession to the EU, various measures were implemented to support high-tech academic entrepreneurship, including for example, science parks, technology incubators and direct financial support. At the same time, limited effort has been made to support high-growth ventures which do not necessarily rely on sophisticated technologies.

A somewhat related factor was the **rapid increase of the number of university graduates** after 1989; it quadrupled between 1989 and 2010. This positive development paved the way for shifting the economy to a knowledge-based, innovation-driven phase. The negative result was that university graduates are currently facing difficulties to find decent employment in large corporations. This in turn shifted their attention to starting own businesses as an alternative carrier path.

Internal factors

KU students were found to have reflected these macroeconomic trends. According to a large-scale questionnaire survey in 2013 conducted by the Chair of Entrepreneurship, only half of KU students did not have any prior business experiences. The remaining half either originated from families with business traditions or ran their own business or both. However, while taking entrepreneurship courses students typically focused on traditional self-employment business opportunities without growth ambitions, thus not requiring extensive use of knowledge and skills acquired in the course of studies.

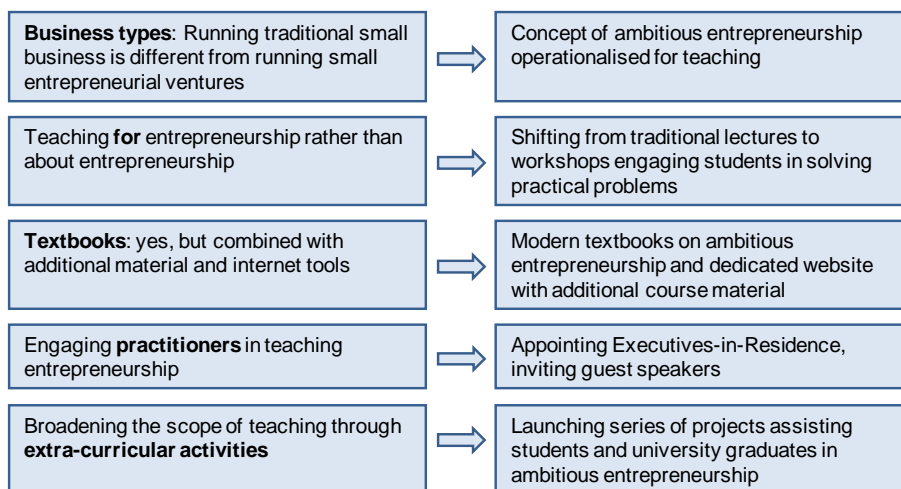
Another disquieting factor was that, although 44% of KU students originated from families with own business background, only a minority was engaged in their parents' businesses. Many students openly declared lack of interest in engaging in family business, considering employment in large corporations as a more attractive career path.

As an additional factor there is a KU tradition in research about knowledge-based entrepreneurship. Back in the 1990s, Prof. Stefan Kwiatkowski, the first Head of the Chair of Entrepreneurship, launched an international research programme in this new and promising field, resulting in a series of publications (Kwiatkowski and Edvinsson, 1999).

Learning from international experiences

In addition to external and internal factors described in the previous section, the vast body of the accumulated international know-how and experiences in teaching entrepreneurship at the university was of crucial importance at the implementation stage. For KU as a "catching up" institution it was a natural step to tap on these resources by conducting thorough analyses of relevant experiences, particularly those of universities in the US, the UK and Scandinavia. Exhibit 1-3 explains how the study of international experiences has affected the concept of ambitious entrepreneurship teaching at KU.

Exhibit 8-3: International experiences in teaching entrepreneurship and lessons for KU



Source: Kozminski University

8.2.3. Target groups

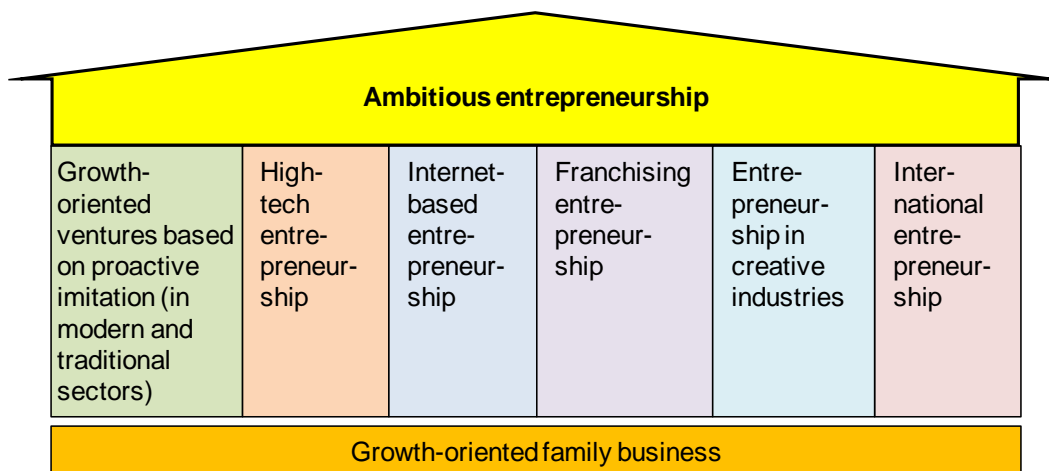
The key target group of entrepreneurship teaching at KU is BA students in Management who have chosen a Major in Entrepreneurship (see section 1.2.1 above). At the MA level, only limited entrepreneurship courses are offered. However, students can take additional courses as electives. PhD students have two specialised courses on research methods and tools.

8.2.4. Designing lectures and courses – basic curricular decisions

Objectives of EE – operationalisation of ambitious entrepreneurship for teaching

In recent years, consensus grew among entrepreneurship educators about a need to fill the gap between traditional small business and high tech entrepreneurship. Appropriate for the KU's approach is the title of a leading textbook by Katz and Green (2011), "Entrepreneurial small business". Authors of another major textbook declare that "you can be both entrepreneur and a small business owner" (Longenecker et al. 2011, p.5). In view of the lack of a widely accepted definition of ambitious entrepreneurship in academic research there was a need for a pragmatic operationalisation of this concept for entrepreneurship teaching at KU, as demonstrated in Exhibit 1-4. More specifically, KU followed a broader concept of an ambitious entrepreneur (Stam et al, 2012, p.26): An ambitious entrepreneur is someone who engages in the entrepreneurial process with the aim to create as much value as possible, which implies that KU has not focused only on high-growth or high-tech ventures.

Exhibit 8-4: Operationalisation of ambitious entrepreneurship for teaching at KU



Source: Kozminski University

The components of ambitious entrepreneurship depicted in the Exhibit are not exclusive but rather overlapping. The framework serves the designation of core and elective courses, as well as extra-curricular activities.

Pilot programme development

In view of the high percentage of KU students originating from families with business traditions, a dedicated pilot teaching and advisory programme was launched in 2012, named “**Family Business Development**”. Formally it was a workshop for master students who, instead of writing a standard master thesis, prepared a detailed development plan of the business run by their parents. In addition to Prof. Jerzy Cieřlik as workshop co-ordinator, an outside business consultant was recruited to assist students in the financial and market analysis.

Among ten students initially joining the programme, six dropped quickly. The key reason was the hesitance of their parents, small business owners, to release financial data. On the other hand the elaboration of a detailed development plan was considered by the students as more difficult and time-consuming than writing a standard master thesis. The remaining four students completed development plans and the results were encouraging. As all of their parents’ businesses were small firms, development plans were the first professional financial and market analyses ever prepared. Students equipped with such documents could demonstrate to their parents the practical relevance of their knowledge accumulated in the course of study at KU.

Based on the evaluation of the results of the pilot, the consulting project “**Family Business Development**” is now being offered at the undergraduate (BA) level for students with Entrepreneurship Major. The core course “New Venture Creation” has been redesigned to focus on ambitious ventures. In addition, “Internet-based Entrepreneurship” and “International Entrepreneurship” have been included as obligatory courses whereas “Franchising” and “Entrepreneurship in Creative Sectors” became elective courses.

Teaching methods

At the time when the ambitious entrepreneurship programme started at KU in 2004, KU EE teachers found that there was already a clear consensus among entrepreneurship educators worldwide. This consensus was that the teaching methods used should encourage active involvement of students in **solving practical problems**, which entrepreneurs are confronted with when starting a new business.

In the internet era, paper textbooks are still an important vehicle for conveying knowledge to students. However, it must be supported by additional tools and materials available electronically for students and lecturers. As a result, KU shifted from traditional lectures to workshops addressing practical issues with the use of additional didactic tools and course materials. In 2006 a modern **textbook “Ambitious Entrepreneurship”** was published in Polish (Cieřlik, 2006), with subsequent editions in 2008 and 2010. Simultaneously, a **related website** was developed by the author, containing additional materials like mini-cases, videos

and shortened version of the textbook in English for international students. Dedicated tools were developed in Excel for example, for evaluating business opportunities, elaborating initial business concepts and business plans, and selecting the optimal taxation regime. The website content is open to all visitors through a Creative Commons License, except some content available exclusively to entrepreneurship lecturers (e.g. PowerPoint presentations, tests, methodical notes). The exclusive content is available upon registration free of charge. The website was initially developed by Prof. J. Cieřlik but with the establishment of the National Network of Academic Entrepreneurship Educators (SEIPA) (see below section 1.5) the content was moved to its current domain at SEIPA (<http://www.seipa.edu.pl>).

Kozminski University has also followed another recommendation stemming from accumulated experiences of international universities in teaching entrepreneurship, namely adding various extra curriculum activities to regular entrepreneurship courses. Specific projects and initiatives are presented in section 1.3.

8.2.5. Setting of entrepreneurship teaching

Locations of EE offers

All courses for regular KU students are offered at the **KU campus in Warsaw**. Special programmes and outreach projects are also mostly offered at KU. There were various attempts to use **distant learning** which, so far, brought mixed results. With regard to training of entrepreneurship educators from other Polish universities (see 1.5.2 below) the major obstacle in conducting consultations and exchanging experiences resulted from excessive time required for travelling from distant locations. Several attempts were made to use distant learning with video-conferencing. However, this proved to be rather inefficient due to inadequate infrastructure and preference for direct contacts by the participants. At the same time, distant methods worked when providing consultations for young entrepreneurs. On implementing the Programme "Warsaw, the Capital of Ambitious Business" (see 1.3. below) an electronic platform was developed, allowing business consultants to monitor new business ventures based on core data regularly submitted by entrepreneurs online. As a result, it was sufficient to schedule face-to-face meetings only once a month.

Timing of EE offers

Timing of entrepreneurship courses for regular KU students depends on the teaching plan adopted at university level. With respect to the extra-curricular and outreach activities, the timing depends on the availability of external funds. Sometimes this creates delays which are detrimental for efficient project implementation. For example, the experiences with the programme of training entrepreneurship educators from other Polish universities indicated the need for repeating the basic training course every second year. This is because some trained entrepreneurship educators leave the university and new staff joins. KU has been able to obtain financing from the Ministry of Science and Higher Education for the two rounds in 2007 – 2011 but could not obtain additional budget for the consecutive period.

8.2.6. Instructors: teachers and mentors

EE teachers from KU

As of end-2014, the KU's team of EE teachers consists of six experts with different fields of specialisation:

- Jerzy Cieřlik, PhD, Associate Professor, Director of the Centre for Entrepreneurship, specialisation in entrepreneurship policy and ambitious entrepreneurship.
- Izabela Koładkiewicz, PhD, Associate Professor, Head of the Chair of Entrepreneurship, specialisation in family business and corporate governance.
- André van Stel, PhD, Associate Professor, specialisation in entrepreneurship and economic development as well as solo entrepreneurs.
- Svetlana Gudkova, PhD, Assistant Professor, specialisation in creativity and entrepreneurship as well as social capital and entrepreneurial networks.

- Piotr Kaczmarek-Kurczak, PhD, Assistant Professor, specialisation in entrepreneurship in creative industries, internet business, and international entrepreneurship.
- Marta Wojtyra, M.A., Teaching Assistant, specialisation in family business.

Based on international experiences of engaging practitioners in teaching entrepreneurship, Jerzy Cieślak, former CEO and founder of Ernst & Young Poland, was appointed as full-time Professor of Entrepreneurship at Kozminski University in 2004. The scope of his duties turned out to be much broader than it would be for a typical appointment of an Entrepreneur- or Executive-in-Residence. It encompasses teaching and research but also administrative responsibilities.

Occasionally, lecturers from other departments are invited to run specialist courses.

Guest speakers

KU frequently invites guest speakers on an ad hoc basis. There were also attempts to invite entrepreneurs as guest speakers for specific courses. Here however, the results were mixed. First, it was difficult to co-ordinate the participation of invited entrepreneurs in the regular courses due to their heavy workload. Last-minute cancellations took place. Second, the content of presentations made by entrepreneurs did not always corresponded to particular learning objectives. This latter shortcoming was partially remedied by elaborating detailed guidelines for entrepreneurship lectures on how to prepare and effectively manage the contributions of invited entrepreneurs.

8.2.7. Management of entrepreneurship education

Teacher and trainer management at KU

Training of entrepreneurship educators at KU reflects, on the one hand, accumulated experiences but also some internal university regulations. When a new course is introduced, a course leader (typically professor) prepares the course materials and runs a pilot course for students in which other lecturers participate. Newly recruited teaching assistants always start with participating in a course run by an experienced lecturer. Finally, according to recently adopted university-wide regulations, Heads of Chairs are obliged to regularly inspect teaching of all staff and give their input.

Extending ambitious entrepreneurship education to other universities

While establishing a solid base for teaching entrepreneurship at KU, several internal and external influences prompted initiatives to reach students and graduates also from other universities in Poland. The following factors were important:

- **Limited number of talented students:** Only a limited number of KU students qualify for participation in advanced extra-curricular projects. In such projects, the KU seeks to provide assistance such as training, mentoring and financial support for students to implement ambitious business projects. However, for some areas like entrepreneurship in creative sectors and technology-based entrepreneurship, many KU students were found to be simply not sufficiently equipped with the necessary knowledge, skills and talents.
- **Teaming up with other disciplines:** KU found that the key success factor in ambitious entrepreneurship is the formation of entrepreneurial teams with a diversified professional background, experiences and resources. KU is basically a business and law school. It was felt that teaming up with students in engineering, agriculture and arts studies would be beneficial.
- **Aiming for national leadership:** As part of a broader strategy, KU leaders thought that the university's competitive position could be strengthened not only through providing superior entrepreneurship education for KU students but also by becoming a widely recognised national leader in that field.
- **Using available infrastructure** played a key role. KU sought to set up a dedicated website with additional functionalities which served as an electronic platform for running entrepreneurship courses, allowing, inter alia, monitoring individual student projects. With

minor adaptation this platform can be used for wider projects involving participants from other universities.

- **Interest in EE from other disciplines:** Regarding external factors, growing interest in entrepreneurship as a career path developed in Poland among students from non-business studies. Such demand increased particularly after 2005 when the increasing supply of university graduates was confronted with saturating or even declining demand for such graduates in the corporate sector.

Due to these influences KU decided to launch extra-curricular activities to reach students from other universities – see the next chapter.

8.3. Extra-curricular projects in entrepreneurship education

Overview about extra-curricular EE activities at Kozminski University

In view of the KU’s ambition to also offer extra-curricular projects to other Polish universities, since 2006 practically all extra-curricular activities initiated at KU have been offered to a wider audience of students and graduates from other HEIs at the local (Warsaw Municipality), regional (Mazovia Region) and national levels. A brief description of such projects is given below. Exhibit 1-5 shows an overview.

Exhibit 8-5: Overview of extra-curricular EE activities at Kozminski University

No.	Name	Objectives	Target group	Offered in / since	No. of participants
1	How to start your own business	Training and professional advice from business consultants	Students from the Mazovia Region	2006 - 2007	120
2	Warsaw, the Capital of Ambitious Business	Supporting the idea of ambitious entrepreneurship	Students and university graduates living in Warsaw	2009 - 2011	360
3	Entrepreneurship in Creative Industries	Entrepreneurship training for artists	Creative arts professionals in Warsaw Metropolitan Area	2009 - 2013	130
4	INNOVATOR	Supporting high technology entrepreneurship	Young university teachers and PhD students in hard sciences	2007 - 2009	50
5	Aula Polska	Informal network for exchanging business ideas	Young enthusiasts of internet businesses	From 2012 onwards	120 - 150 in each session

A key enabling factor for running extra-curricular entrepreneurship projects was the availability of EU financing of such projects after Poland’s accession to the EU in 2004. Moreover, priority in financing was given to wider-scope projects, involving broader spectrum of beneficiaries.

How to start your own business

“How to start your own business” was a training and advisory programme for students in the Mazovia Region from 2006 to 2007. 120 students from 32 universities in the Mazovia Region received training and professional advice from business consultants. 25 of them started a new business, from which twelve received financial support from EU funds. This project helped to refine teaching methodologies to take into account the background and attitudes of non-business students. It also served as a testing ground for an already existing electronic platform and its capacity for running projects with a wider scope.

Warsaw, the Capital of Ambitious Business (2009 – 2011)

This EU-funded project in co-operation with Warsaw Municipality attracted 360 participants receiving training and consultancy. These were students and university graduates living in Warsaw. 228 of them started new businesses and 72 received financial support. In this project the idea of ambitious entrepreneurship was put forward for the first time in Poland, as an alternative of supporting self-employment on the one hand and high-tech on the other. The focus was on ambitious projects, albeit the large number of students and university graduates in Warsaw. At the same time the project uncovered a large potential for knowledge-based entrepreneurship among professionals willing to give up secure employment in large firms and starting their own business.

Entrepreneurship in Creative Industries (2009 – 2013)

“Entrepreneurship in Creative Industries” was another EU-funded project addressed to the creative arts professionals in the Warsaw Metropolitan Area. 130 artists were trained of which 100 started a new business with financial support from the EU. Again this project uncovered great demand for support of entrepreneurial activities and integrating the business community in creative sectors. This was reflected in the establishment of the Association of Creative Entrepreneurs by project participants.

INNOVATOR (2007 – 2009)

INNOVATOR was a high technology entrepreneurship course for young university teachers and PhD students in natural sciences. The project was sponsored by the Polish National Science Foundation. Altogether 50 young scientists received training and professional advice in three rounds. Authors of the best projects received further financial support from the National Science Foundation. Several leading spin-off companies emerged from INNOVATOR, one currently being quoted on the Warsaw Stock Exchange. Another interesting outcome of the INNOVATOR programme was the social high-tech project named Bank Mleka (Human Milk Bank). This is a non-profit organisation offering technologically advanced storage and distribution of natural human breast milk for babies. It was initiated by a young biotechnologist, lured to entrepreneurship while participating in the INNOVATOR programme. The experience accumulated during three rounds of the INNOVATOR programme pointed to some systemic weaknesses in the education of potential academic high-tech entrepreneurs. The participants, on average approximately 30 years old, were exposed to entrepreneurial thinking for the first time. This proved to be late as at that time their minds were focused on technological aspects of the new venture. The results, i.e. the number and quality of high-tech start-ups, could potentially have been much greater if INNOVATOR participants had received basic entrepreneurship training at the bachelor or master level.

Aula Polska (2012 onwards)

Aula Polska was an informal network of young enthusiasts of internet businesses. It started as a bottom-up initiative. Young people meet twice a month, listen to presentations from more experienced peers and exchange ideas during a subsequent pizza event. Each session gathers typically 120 to 150 participants. Since 2012 Kozminski University hosts Aula sessions at its premises and provides organisational and financial support.

Overall initial results

With the accumulated experiences in implementing extra-curricular entrepreneurship programmes, the organisers found that the wider formula of involving students and graduates from various universities was right. First of all it increased the quality of participating students. In fact, KU students represented less than 10% of participants. This was because in the selection process non-business students and university graduates presented better initial business concepts and were later more diligent in preparation of the fully-fledged business plans.

At the same time there is a positive “reverse demonstration effect” for KU students. An increased interest has been noted in specific courses like “Internet-based Entrepreneurship” and “Entrepreneurship in Creative Industries”. Since regular Aula Polska sessions are nowadays organised at Kozminski University premises, many KU students attend them regularly.

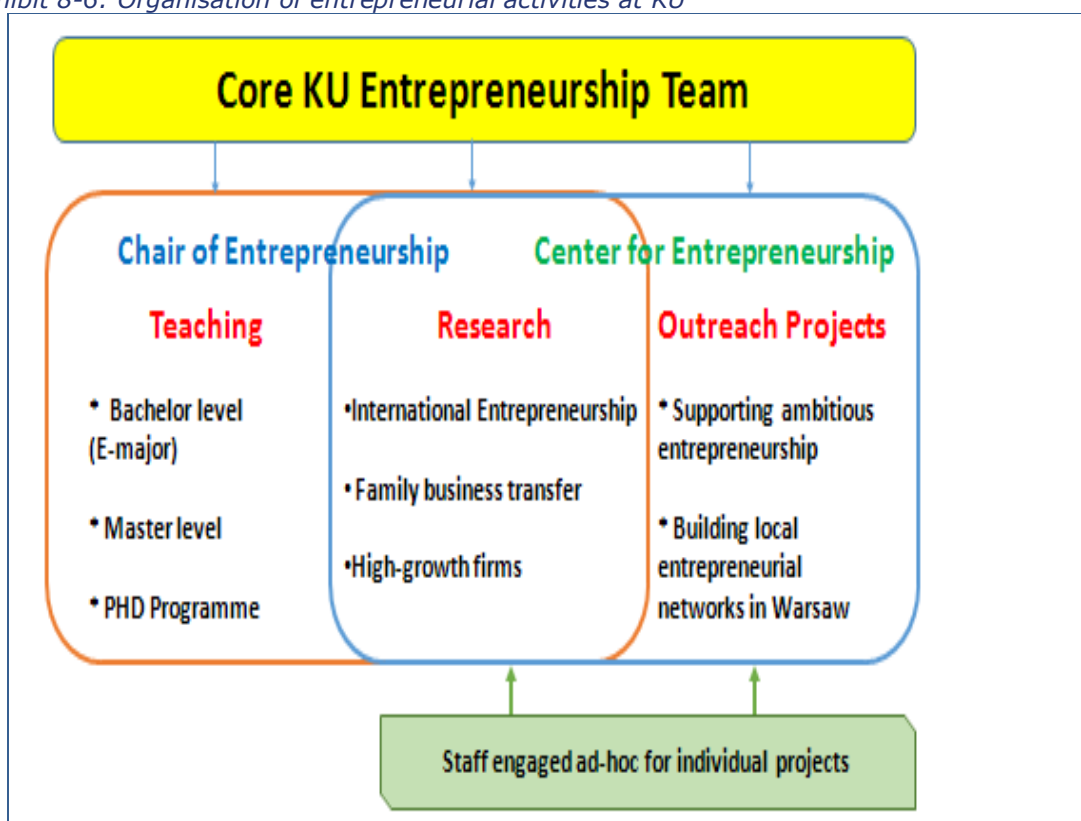
8.4. Institutional aspects of entrepreneurship education

Organisational set-up and change

The Chair of Entrepreneurship exists since the inception of Kozminski University. During the first decade (1993 – 2003) the focus was on implementing basic courses in entrepreneurship. In the second decade (2004 – 2013), attention shifted to ambitious forms of entrepreneurship in a wider context: prompting entrepreneurship development at the regional and local level, reaching to other universities, and extending the concept of entrepreneurship beyond the business sector.

As the scope of extra-curricular activities and research in entrepreneurship expanded, in 2010 the research and outreach activities were moved to the newly established Centre for Entrepreneurship¹³³. However, both units operate in an integrated way, under joint management, sharing both staff and premises (see Exhibit 1-6).

Exhibit 8-6: Organisation of entrepreneurial activities at KU



Source: Kozminski University

Mindsets and attitudes

A significant percentage of KU students have already been exposed to entrepreneurship before attending KU, either by running an own business or due to family business traditions. Therefore, KU attempted to shape their mindsets and attitudes not towards entrepreneurship in general but to the ambitious forms of entrepreneurship. To that end, the booklet presenting the coaching and consulting offer in entrepreneurship to KU students bears the title “We support ambitious entrepreneurship”. However, shifting mindsets turned out to be challenging: as described in section 1.3, experience with extra-curricular activities showed that non-business students and graduates from other universities so far showed more promising efforts to develop ambitious enterprises than students from KU. Second, the KU entrepreneurship team refrains

¹³³ See <http://www.kozminski.edu.pl/index.php?id=5012>, last accessed 23/3/2015.

from coaching routine business projects. This sometimes results in negative reactions from the students.

8.5. Outreach to external stakeholders

8.5.1. Types of relationships with external stakeholders

KU's entrepreneurial orientation is deeply rooted in its history as one of the first private higher education institutions in Poland. Later on, links with external stakeholders were formalised. In 2003, the International Corporate Advisory Board was founded with the participation of leading international and Polish executives. The growing number of internship programmes is managed within the framework of long term agreements with companies and financial institutions.

According to the experiences accumulated at KU, the **opportunities for direct engagement of entrepreneurs in teaching are quite limited**. It is very difficult to go beyond the invited guest speaker formula. This is due to the formalisation of the didactic process with specific requirements for course delivery and assessment. There are national and even EU-wide regulations which must be followed in this respect. Active entrepreneurs do not feel comfortable in such an environment, not to mention the limited time that they can devote to teaching students.

KU has built a strong **Alumni Club** with regular meetings, constant communication through a website, newsletters, social media and job counselling. Each year three KU alumni with the most spectacular and successful career paths receive special awards, the "Kozminski Lions". One of the awards is given to the most successful entrepreneur.

8.5.2. Training educators from other Polish universities

Lessons from international experiences

Training of entrepreneurship lecturers from other higher education institutions, particularly from non-business disciplines, was another important offspring of KU's ambitious entrepreneurship programme. The decision to launch a "training of trainers" approach was largely influenced by experiences from other countries in similar undertakings. The KU paid particular attention to national programmes for supporting venture-premiership lecturers in HEIs initiated by the UK National Council for Graduate Entrepreneurship established in 2004, later renamed to National Center for Entrepreneurship Education. Another example is the German organisation FGF (Förderkreis Gründungsforschung e.V.) which was instrumental in establishing chairs of entrepreneurship at a number of German universities. A similar approach was taken in the US in an initiative launched in 2011 to improve entrepreneurship education in 350 engineering universities across the country. A nationwide project called Epicenter is being financed by the US National Science Foundation and managed by Stanford University. It offers training for lecturers, sophisticated pedagogical tools and serves as a platform for sharing best practices.

Situation in teaching entrepreneurship in Polish non-business universities

The reason why KU concentrates on non-business universities in training the trainers reflects an urgent need. This is because entrepreneurship courses were almost non-existent at such universities ten years ago. On the other hand, KU's initial experiences in regional extra-curricular programmes demonstrated that non-business students, once equipped with relevant knowledge and skills and being familiarised with entrepreneurial thinking, put forward much better new venture projects than their business counterparts. After 2006, when KU's core academic textbook on ambitious entrepreneurship was published and accompanied by a dedicated website, there were a number of inquiries addressed to KU to run entrepreneurship courses outside KU. Such requests could not be accommodated due to time limitations and because of a potential conflict of interest.

"Training of trainers" projects initiated by KU during 2007 – 2011

In 2007, Kozminski University received a grant from the Polish Ministry of Science and Higher Education to train a first group of 20 university lecturers, preparing them for introducing basic courses in entrepreneurship at their universities. The support included:

- Methodological and pedagogical tools (PowerPoint presentations, tests) available to university teachers only;
- Teaching materials and tools for students available on the dedicated website – the original content has meanwhile been broadened and diversified, including videos and English language materials;
- Short (two-day) “kick-off” workshops for all participating lecturers;
- Ongoing support and monitoring of the implementation of the pilot course in entrepreneurship which was an obligatory requirement for all lecturers participating in the programme.

In 2008, the Ministry of Science and Higher Education provided finance to KU for training the next group of entrepreneurship educators. In addition to 20 lecturers from new universities, six pairs of lecturers from the previous group and consultants received training on the implementation of more advanced extra-curricular forms of entrepreneurship education, thus mirroring the KU’s experience with such programmes.

Entrepreneurship lecturers participating in the programme

During 2007 – 2011, the programme encompassed over 50 university lecturers from 40 non-business universities in Poland. The implementation of entrepreneurship courses marked a qualitative change in those universities, becoming a triggering factor for further local initiatives. At the same time it revealed certain problems and barriers:

- **Turnover of universities’ lecturers:** in several cases the lecturers trained in running entrepreneurship courses left their universities, which jeopardised the continuation of such courses. This seems to be inevitable and calls for a continued effort to “replenish” lost educators. It has been estimated that in order to ensure continuity and expansion in teaching entrepreneurship at Polish universities, every second year, 20 new entrepreneurship educators need to be trained. At the end of 2014, KU was seeking funding for the next round.
- **Entrepreneurial attitude of entrepreneurship educators:** the key lesson from the “training of trainers” programme is that successfully launching entrepreneurship education strongly depends on the entrepreneurial mindset of the lecturers. This does not mean previous business experience, but rather character traits like energy, drive and enthusiasm; inspiring students and shaping their entrepreneurial minds. The KU also considers a drive to establish contacts with the business community, launching new projects and seeking finance for such initiatives as important.

Unfortunately, such entrepreneurial attitudes as described in the following box text were found to be quite rare among lecturers participating in the programme. This may call for a more sophisticated selection of the next group of entrepreneurship lecturers receiving training and support.

An exemplary case of shaping lecturers’ entrepreneurial mindsets

Dr Agnieszka Skala, Assistant Professor from Warsaw Polytechnic, may serve as a good example for training teachers in entrepreneurship education. In 2007 she participated in the first group of university lecturers being trained in a KU-managed project. In 2008 she introduced a basic course on Innovative Entrepreneurship in one department of the Warsaw Polytechnic. The course was a major success and was rated highly by students. In 2009 she obtained funds to initiate a large-scale project aimed at launching entrepreneurship courses in an additional 15 departments of the Warsaw Polytechnic. She co-ordinated the training of entrepreneurship lecturers thus further extending the idea of “training of trainers”. In 2012, she co-founded the “Innovation Nest” (SPIN School), a nationwide initiative focusing on young promising internet start-ups. In 2013, she graduated from the prestigious Lean Launchpad Educators Program at the University of California in Berkeley, US.

Source: Kozminsky University

Support from the leadership of participating universities

The key enabling factor in launching entrepreneurship education was the support from the universities’ leadership. In a typical environment of hard science studies, agricultural or

engineering universities, the entrepreneurship subjects are being viewed as “soft”, thus less important than “hard” ones representing the core of students’ curricula. In order to implement entrepreneurship courses and convince the university teachers about their usefulness, a lecturer must rely on full support from the university’s management. Unfortunately, in a number of institutions this was not the case. As a partial remedy in the second round of training of lecturers, the final decision about admission was conditional upon a written declaration of support from the Rector of a certain university.

Network of Academic Entrepreneurship Educators in Poland (SEIPA)

The lecturers trained in KU experienced the “feeling of loneliness” while struggling to introduce entrepreneurship courses of their home universities. This experience led to the establishment of the Network of Academic Entrepreneurship Educators in Poland (SEIPA). This is an informal network composed of entrepreneurship lecturers participating in the KU-managed training programmes as well as others interested in relevant materials and methodologies, exchanging ideas, and best practices. In 2011, all teaching content was moved to the SEIPA website. KU’s Prof. Jerzy Cieřlik is the co-ordinator for the SEIPA network.

8.6. Impact and lessons learned

8.6.1. Measuring impacts of KU’s entrepreneurship education approach

When evaluating the impact of KU’s EE approach regarding key lessons learned and transferability to other universities, one needs to bear in mind KU’s “catching-up context”. KU believes its experiences are particularly relevant for universities lagging behind in EE and intend to quickly narrow the gap with leading international education institutions in this field. In this regard, the impact of the entrepreneurship education approach taken at KU can be evaluated in four distinct, albeit interlinked areas:

- **Driving students’ attention towards ambitious, growth-oriented ventures.** In its entrepreneurship courses, KU exposed students to alternatives to traditional small business thinking about entrepreneurship. Particularly, extra-curricular activities have been stressing the message to “do not think small”. The positive impact of this approach was demonstrated in a number of ways: The survival rate of businesses launched as a result of several extra-curricular projects implemented by KU as described above was much higher than the average in Poland. For example, according to a survey of firms receiving support under the programme “Warsaw, the Capital of Ambitious Business”, 72% of those firms established in 2010 were still active in 2013, whereas the average ratio for Poland in same period was 42%. Moreover, the ratio between employer- and non-employer firms was higher as well.
- **Filling the gap between small business and high-growth, high-tech ventures.** Entrepreneurship as a career option for university graduates is typically seen as a choice between traditional small business establishments and high-growth, high-tech ventures. KU’s experience helped to identify a substantial “intermediate zone” where university graduates could engage in ambitious business projects which basically have an imitative character but enable students to use knowledge and skills gained in their studies.
- **Involving students and graduates from various education institutions in extra-curricular projects.** Here the KU found a clearly demonstrable impact. By limiting participation to KU students, i.e. to business students, certain projects such as supporting entrepreneurship in the creative sector would not have been possible to implement. The “reverse demonstration effect” for the KU students should not be neglected as well.
- **Promoting entrepreneurship education in non-business universities.** KU sees a direct and clearly visible impact of its efforts to promote EE at other Polish universities: 40 Polish non-business universities launched entrepreneurship courses afterwards. This impact was achieved at relatively low costs. For training 52 lecturers from 40 universities, KU received two grants from the Ministry of Science and Higher Education, totalling 461,000 PLN or 110,000 euro. Thus the average cost per university was less than 3,000 euro.

An important outcome of KU's "training of trainers" approach was the establishment of the Network of Academic Entrepreneurship Educators in Poland (SEIPA). Although it worked as a loose network at the end of 2014, it had already played an important role in integrating the community of academic entrepreneurship lecturers in Poland. This may lead to a more formalised structure in the future.

8.6.2. Lessons learned – success factors for launching EE

Summary of lessons learned from this case

The know-how about EE accumulated by Kozminski University may be particularly relevant to universities with limited experience in teaching entrepreneurship. Based on the experiences accumulated since 2007, KU identified **three success factors** for launching entrepreneurship education in non-business universities: **entrepreneurial entrepreneurship educators, a network of academic entrepreneurship educators, and support from university leadership**. KU found that these factors mutually reinforce each other. The key figure in this process is an "entrepreneurial entrepreneurship educator" who receives support from the university's top management and is part of nationwide network.

Transferability to other universities

In principle, other universities may easily adopt KU's EE approach. There is material available that could facilitate a transfer of the approach or parts of it: KU's experiences in teaching entrepreneurship are described in a monograph (in Polish) "Education for Academic Entrepreneurship" (Cieślik et al., 2011). There is a small booklet available promoting ambitious entrepreneurship among students, published in Polish in 2013, titled "We support Ambitious Entrepreneurship". Various course materials, tools, and methodologies are freely available – under a Creative Commons License – on a dedicated website (www.seipa.edu.pl). Some materials are also available in English. These materials may help other universities to assess whether KU's approach could be valuable for them.

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Research for this case study was conducted by Professor Jerzy Cieślik, Director of the Centre for Entrepreneurship at Kozminski University, on behalf of the study for supporting the entrepreneurial potential of higher education (sepHE). The author has been deeply involved and in fact managed the process of engaging Kozminski University in ambitious entrepreneurship education. Although effort has been made by the author to ensure objectivity, some personal reflection was unavoidable.

Sources and references used include desk research plus:

Interviews and other sources

- Panel discussion held on 25 of July 2014 at Kozminski University premises with two entrepreneurship lecturers at Kozminski University Prof. Izabela Kołodkiewicz and Prof. Piotr Kaczmarek-Kurczak.
- Interview with Prof. Agnieszka Skala – an entrepreneurship lecturer at the Warsaw Polytechnic. The interview has been carried out on 23 July 2014 at Warsaw Polytechnic premises.
- The case study relied heavily on discussions and presentations of students and graduates participating in various extra-curricular programmes initiated by KU. Some of them have been summarised in an unpublished master thesis by M. Balicka (2009) or videotaped.
- As a background material, a large-scale questionnaire survey covering 28% of the entire population of KU students has been used. The survey has been administered on behalf of KU Chair of Entrepreneurship in May 2013.

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9. University of Liège, Belgium: VentureLab – establishing an entrepreneurial ecosystem at a university

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Abstract



Entrepreneurship education (EE) at the University of Liège (ULg) is initiated, driven and implemented by the University's management school HEC (École des Hautes Études Commerciales). At the heart of EE at ULg is the VentureLab, a non-profit entity linked to HEC-ULg. It maintains an ecosystem of EE to, firstly, encourage students to become engaged in entrepreneurial activities and, secondly, support students who are developing an entrepreneurial project. The principal elements of EE at ULg are the Master level programme HEC-ULg Entrepreneurs and an incubator. Further important elements include entrepreneurs in residence, a special university status for student entrepreneurs, a system of vouchers to consult experts, events like "the corner of opportunities", a club of student entrepreneurs, the "student entrepreneurial passport", the showcase for entrepreneurial projects, and a Master programme in creativity. The status of a student entrepreneur may be particularly innovative: It provides students who are seeking to start a new enterprise with specific advantages and support in their pursuit of a study programme. While fully supported from the university's top, EE at ULg takes a bottom-up approach. It is initiated by a group of enthusiastic people around the Chair of Entrepreneurship, and from there spreading throughout the university. HEC-ULg considers its approach as easily transferrable to other universities.

Case study fact sheet

▪ Full name of the university, location:	University of Liège (ULg), city of Liège, Wallonia, Belgium
▪ Legal status:	Public
▪ Campuses:	Two campuses: Liège city centre and Sart Tilman university campus. The Gembloux site (Province of Namur) hosts studies in agronomy sciences and biological engineering. Establishments in South Belgium: Arlon and Mont-Rigi, High Fens Oceanographic base Stareso in Calvi, Corsica
▪ Year of foundation:	1817
▪ Number of students (year):	More than 20,000 (2014)
▪ Number of employees:	5,000 employees 3,300 faculty members (both teaching and research) 1,700 administrative and technical support staff
▪ Budget in most recent financial year:	Operating income 2008: 314 million euro
▪ Academic profile (departments, major awards, role in national or regional higher education system):	Nine Faculties (Philosophy and Letters; Law, Political Science and Criminology; Science; Medicine; Applied Science; Veterinary Medicine; Psychology and Education; Agro-BioTech; Architecture), one School (HEC-ULg School of Management), one Institute (Institute for Human and Social Sciences)
▪ Entrepreneurship education profile:	ULg's Management School maintains and develops an informal entrepreneurial ecosystem at ULg
▪ Activities focused in this case study:	VentureLab and master programme HEC-ULg Entrepreneur
▪ Case gatekeeper:	Prof. Dr. Bernard Surlemont, Full Professor for Entrepreneurial Skills at ULg's Management School

(HEC-ULg)

Information included in this case study is from end of year 2014 unless stated differently.

9.1. The university's entrepreneurial profile

9.1.1. The university's overall approach to entrepreneurship education

Key characteristics of ULg's entrepreneurial ecosystem

The University of Liège (ULg) is the only full public university of the French Walloon-Brussels community in Belgium. Entrepreneurship education (EE) at the University of Liège (ULg) is part of a concept of an **entrepreneurial ecosystem**. The ULg's EE protagonists have established this ecosystem over many years and are seeking to develop it further continuously. ULg apply the biological notion of an ecosystem – a community of living organisms in their nonliving environment – to entrepreneurial activities at their university. The ULg's entrepreneurial ecosystem has emerged from and consists of networks of actors, such as academic staff, students, administrative units, partner entrepreneurs and companies, and activities related to entrepreneurship education.

The heart of the ecosystem is called the "**VentureLab**"¹³⁴. The VentureLab is an entity located at ULg's Management School (HEC-ULg – HEC is the abbreviation of "Hautes Études Commerciales"). According to the Academic Director of the Venture Lab, Prof. Bernard Surlemont, the VentureLab's overall objective is twofold: First, motivating students to become engaged in entrepreneurial activities, and, second, supporting students and young alumni (until two years after graduation) from all over the university in their entrepreneurial activities. The VentureLab represents the institutionalised interface between entrepreneurial education and the stakeholders of the entrepreneurial ecosystem. This means in particular preparing for and starting a new company. At its location, adjacent to the business school – almost next door on the same street - VentureLab provides the physical infrastructure for many EE activities.

The VentureLab has three **missions**: (1) supporting the transition of students' and young graduates' entrepreneurial activities into employment creation; (2) contributing to the economic revitalisation of the Liège region and; (3) providing answers for social questions.

A key task of the VentureLab is to provide orientation to students so that they connect with other actors needed for funding, coaching, grants, and other resources. VentureLab's **activities** include organising seminars for students and entrepreneurs, offering start-up weekends, and providing coaching for current and former student projects. It is located in an adjunct building to the management school and provides seminar rooms and co-working space for students of entrepreneurial programmes. In November 2014, VentureLab was launched as an institution of the University. This formalisation is meant to improve efficiency and increase the capacity for supporting entrepreneurial activities. Furthermore, VentureLab is currently expanding its services to educational institutions in the Province of Liège and in Luxembourg.¹³⁵

Further **core components of the ULg's entrepreneurial ecosystem**, related to the VentureLab, are a Master-level study programme named HEC-ULg Entrepreneurs (Entrepreuriat) created in 2005, and a student incubator. The students of the HEC-ULg Entrepreneurs Master programme can use the VentureLab's facilities. The VentureLab provides the interface between the entrepreneurs and practitioners teaching in the MSc programme. Further components of the ecosystem include (details provided further below in this case study):

- (1) Entrepreneurs in residence.
- (2) A special status for student entrepreneurs.

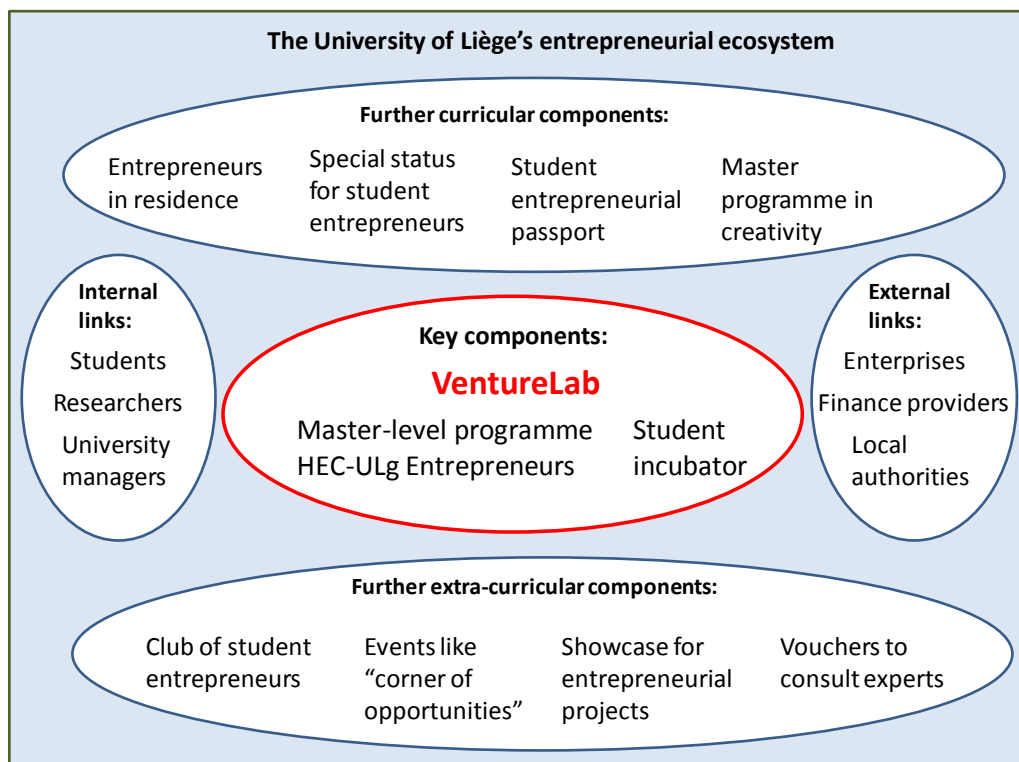
¹³⁴ See <http://www.venturelab.be>.

¹³⁵ Comprising Haute Ecole de la Province de Liège, Haute Ecole Libre Mosane, Haute Ecole de Namur-Liège-Luxembourg, Haute Ecole Charlemagne, Haute Ecole Robert Schuman, Haute Ecole de la Ville de Liège, Conservatoire royal de Liège, Ecoel Supérieure des Arts Saint-Luc et l'École supérieur des Arts de la Ville de Liège.

- (3) Vouchers to consult experts, which allow students to use a certain number of hours in which they have access to experts, such as consultants, lawyers, technical experts and IT specialists. These external experts offer their expertise for free.
- (4) Events like “the corner of opportunities”, where students meet entrepreneurs to discuss entrepreneurial issues and receive feedback on their project and initiatives.
- (5) A club of student entrepreneurs.
- (6) The “student entrepreneurial passport”.
- (7) Master programmes in entrepreneurship and in creativity.
- (8) A network of partnering enterprises and other cooperation partners, including local authorities.

Some of these components are more than ten years old; others have just been put into place. Exhibit 9-1 shows an overview about ULg’s entrepreneurial ecosystem.

Exhibit 9-1: Overview about the University of Liège’s entrepreneurial ecosystem



Source: empirica

This case study explores how the ULg developed entrepreneurship education within its entrepreneurial ecosystem, paying particular attention to the question whether and how it is possible to deliberately implement such an ecosystem.

Ecosystem history and outreach

The history of entrepreneurship education at ULg dates back to the early 1980s, when ULg established the technology transfer office to commercialise research output. As a result, the rectorate felt that such commercialisation would be facilitated by educating and supporting students in entrepreneurial activities. Later on, the idea of entrepreneurship education was spread across all faculties and became an accepted part of the University. Today, the University of Liège considers itself as a pioneer in entrepreneurship and entrepreneurship education in Belgium.

9.1.2. Leadership and governance

Importance of government strategies

The ULg's approach toward entrepreneurship education is initiated and implemented by a group around Professor Bernard Surlemont, Professor for Entrepreneurial Skills at the ULg's Management School.

While the VentureLab receives financial support from private sponsors, a charity foundation (InBev Baillet-Latour) and structural funds (ESF and European Fund of Regional Development), EE initiatives are independent of government policies.

Importance of entrepreneurship in the university's strategy

In its **mission statement**, ULg as a full university with several faculties emphasises the two traditional pillars of a university, research and teaching. In addition, it prides itself on a third pillar that is aimed at valorisation of research for the benefit of society: "The ULg also stands out through its very wide and very varied range of scientific and valuation society-oriented activities. (...) These activities include the active policy of ULg as regards highlighting the importance of research, resulting in the creation of more than 80 spin-off companies and the implementation of tools and services accompanying the various valuation stages (intellectual property, management training, financing, partner research, ...)".¹³⁶

The **strategy of the Management School** HEC-ULg is more explicit and specific about EE. Among its five core values the HEC-ULg emphasises "creative entrepreneurial audacity" which aims to educate and support students to become entrepreneurs after the completion of their degree programme.¹³⁷ According to the Dean of HEC, Wilfried Niessen, entrepreneurship is firmly embedded in the strategy of the management school.

Extent of high level commitment to implementing entrepreneurship

The top-level university leadership team, including the rectorate, supports EE. While there is no specific budget or functional responsibility dedicated to entrepreneurial education at the university level, the university provides for work space for EE activities – especially the VentureLab – and human resources in terms of a chaired professorship and university assistants.

Level of faculties' and units' autonomy to act

The entrepreneurial ecosystem around VentureLab is embedded within and supported by HEC management school, which within the university enjoys almost full autonomy about its initiatives, budget, and personnel decisions.

Similar to other full public universities, the faculties at ULg are largely independent and are managed in a decentralised way. This has implications for initiating and implementing EE: Each faculty targeted for EE activities needs to be lobbied and convinced about the merits of each EE initiative in order to be approved and implemented at the faculty level.

Bernard Surlemont illustrates this with the example of the entrepreneurial passport, a certificate students are awarded if they accumulate a certain number of credits for participating in entrepreneurial activities. While HEC-ULg has taken the lead in initiating and implementing the entrepreneurial passport, each faculty needs to be convinced of the merits of the certificate and subsequently approve and implement it for its students. This has proven challenging in those faculties which are rather alien to the idea that knowledge should be used for business purposes, e.g. in the medical faculty and in the philosophical faculty.

University's importance for driving entrepreneurship in its environment

Since the 1950s, Liège has been severely affected by the decline of the coal and steel industries. The University plays an important role as an educational institution providing the skills basis to counter the negative effects of the industrial decline of the region. Entrepreneurial education and the VentureLab – especially with its links to the local educational institutions – also contribute to revitalising the regional economy.

¹³⁶ See http://www.ulg.ac.be/cms/a_16259/en/missions.

¹³⁷ See <http://www.hec.ulg.ac.be/en/node/1232>.

In addition to private-sector entrepreneurship, HEC-ULg maintains a so-called “Peak of Excellence” in the area of Social Enterprises and Social Economy. Since the 1990s, the ULg’s Centre for Social Economy (CES) deals with the topics of social economy and social entrepreneurship.¹³⁸ There is some degree of cooperation with VentureLab in terms of sharing of access to each other’s networks. CES is, however, not dealt with in this case study. Beyond the confines of ULg, HEC also co-operates with polytechnic universities in Liège and the Liège region.

9.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

Entrepreneurship education at ULg is implemented by several key actors. The General Director of the VentureLab is **Bernard Surlemont**, full Professor for Entrepreneurial Skills at the ULg’s Management School. He is also Academic Director of the Master HEC-ULg Entrepreneur programme. Surlemont has been building the ecosystem since the mid-1990s. He is the single most important actor of EE at ULg.

An additional manager of the project is **Hubert Brogniez**, who is also entrepreneur in residence in the VentureLab. Professors Sybille Mertens (Cera Chair in Social Entrepreneurship) and Benjamin Huybrechts (SRIW-Sowecsom Chair in Social Economy Management) are responsible for the topics of social economy and social entrepreneurship.

Other elements of the entrepreneurial ecosystem are the **entrepreneurs in residence**, who are nominated and selected by the VentureLab based on their experience, their speciality and talents. They are expected to co-operate with VentureLab.

HEC-ULg is also tapping expertise through **partnerships** with a vast number of experts from finance, legal services, technology, and commerce. They are, for example, involved in the process of coaching students and participating in juries for evaluating entrepreneurial projects of students.

Financial resources for entrepreneurship education

As a non-profit organisation, VentureLab seeks funding through financial support from companies (e.g., BNP Paribas Fortis, Rossel RTL Group) and public policy programmes, such as the EU structural funds. The University provides a physical infrastructure and human resources to several EE-related activities.

9.2. Entrepreneurship in curricula and teaching

9.2.1. Overview about curricular offers

Curricula offers and units providing them

All curricular offers in entrepreneurship education at ULg are run by the HEC-ULg Management School. HEC-ULg integrates curricular EE offers at other faculties and schools. It offers courses at all academic levels, from Bachelor to Master and executive education, as well as PhD.

- At Bachelor level there is also an “Introduction to Entrepreneurship” course, which is an elective for the “Economics in Management” degree.
- There are six courses in entrepreneurship, most of them for Master degree students in Management seeking to specialise in entrepreneurship.
- Two Master courses deal with social entrepreneurship and target students in Population and Development Studies as well as Labour Sciences.
- Two courses are for students at the executive level which deal with creativity.
- One course is at the PhD level, which is a doctoral seminar about entrepreneurship.

¹³⁸ See www.academie-es.be.

Almost all courses are taught by Bernard Surlemont (two of which are taught in collaboration with Professor Huybrechts). The only exception is the two courses in social entrepreneurship that are taught by Sybille Mertens.

In line with the overall educational strategy of the school as part of a university, the emphasis of entrepreneurship education is at master level. The areas of entrepreneurship and innovation are so-called “transversal elements” across all four master programmes. Exhibit 9-2 shows an overview of the curricular offers in EE at the University of Liège.

Exhibit 9-2: Overview about curricular EE offers at the University of Liège

No.	Name and teacher	Objectives	Target group	Offered since [year]	No of participants in 2014/15
Bachelor level					
1	GEST0006-2 Introduction to entrepreneurship (Bernard Surlemont) ¹³⁹	At the end of this course, students will be able to: <ul style="list-style-type: none"> - Identify their strengths and weaknesses in terms of entrepreneurial abilities - Understand the implications of an entrepreneurial approach - Apply what they have learnt to identify an entrepreneurial opportunity - Use positive psychology theories to construct their own entrepreneurial approach - Better understand the current societal stakes 	Elective Bachelor degree in Economics and Management, 3rd year, Elective Bachelor degree in Business Engineering, 3rd year	2002	45
Master level					
2	GEST0214-2 Personal project (Bernard Surlemont) ¹⁴⁰	This course aims to enable students to implement a personal, concrete project through the creation of a business plan.	Master degree in Management, professional focus in Entrepreneurship, 2nd year	2010	5
3	GEST3050-1 Creativity and design (Bernard Surlemont) ¹⁴¹	<ul style="list-style-type: none"> - Being capable of professional team work - Developing a critical sense (arguing) - Creative conception of solutions 	Master degree in Business Engineering, professional focus in Intrapreneurship, 2nd year	2010	20
4	GEST3156-1 Opportunity identification (Bernard Surlemont) ¹⁴²	n.a.	Master degree in Management, professional focus in Entrepreneurship, 2nd year	2014	18
5	GEST3157-1 Business Model Generation	n.a.	Master degree in Management, professional focus in	2014	18

¹³⁹ See <http://progcours.ulg.ac.be/cocoon/en/cours/GEST0006-2.html>.

¹⁴⁰ See <http://progcours.ulg.ac.be/cocoon/en/cours/GEST0214-2.html>.

¹⁴¹ See <http://progcours.ulg.ac.be/cocoon/en/cours/GEST3050-1.html>.

¹⁴² See <http://progcours.ulg.ac.be/cocoon/en/cours/GEST3156-1.html>.

	(Bernard Surlemont) ¹⁴³		Entrepreneurship, 2nd year		
6	GEST3158-1 Mission creation (Bernard Surlemont) ¹⁴⁴	n.a.	Master degree in Management, professional focus in Entrepreneurship, 2nd year	2004	
7	GEST3160-1 Networking and financing (Bernard Surlemont) ¹⁴⁵	n.a.	Master degree in Management, professional focus in Entrepreneurship, 2nd year	2014	
Executive level					
8	GCER0119-1 Creativity (Bernard Surlemont) ¹⁴⁶	Introductory course to introduce aspects of creativity.	Executive master students	2014	
9	GCER0120-1 Enlarge Creativity (Bernard Surlemont, Emilie Vandermeiren) ¹⁴⁷	Advanced course to elaborate on further aspects of creativity.	Executive master students	n.a.	
PhD					
10	GDOC0010-1 Doctoral Seminar in Entrepreneurship (Bernard Surlemont) ¹⁴⁸	The objective of the seminar is to give students insight about the major theoretical subjects and methodologies in the field of entrepreneurship.	PhD Students of the HEC Doctoral Programme	n.a.	

Source: University of Liège

9.2.2. Target groups

Main target groups of entrepreneurship education

The ULg's entrepreneurial ecosystem is available to the whole university. EE at ULg targets students and recent graduates (up to two years after graduation) from all faculties. At the master level, roughly one third of EE participants come from HEC-ULg Management School, while two thirds are from other faculties (one third engineers and one third from other fields such as law). This has to do with the structure of master programmes. To start with, there are master students who study exclusively with HEC for two years to obtain the master, e.g. in entrepreneurship. In addition, there are students, who have already completed a two-year master programme, and study for a third year at HEC to obtain their second master degree.

The Technology Transfer Office's responsibilities also include continuous education.¹⁴⁹

9.2.3. Designing lectures and courses – basic curricular decisions

Objectives

¹⁴³ See <http://progcours.ulg.ac.be/cocoon/en/cours/GEST3157-1.html>.

¹⁴⁴ See <http://progcours.ulg.ac.be/cocoon/en/cours/GEST3158-1.html>.

¹⁴⁵ See <http://progcours.ulg.ac.be/cocoon/en/cours/GEST3160-1.html>.

¹⁴⁶ See <http://progcours.ulg.ac.be/cocoon/cours/GCER0119-1.html>.

¹⁴⁷ See <http://progcours.ulg.ac.be/cocoon/cours/GCER0120-1.html>.

¹⁴⁸ See <http://progcours.ulg.ac.be/cocoon/cours/GDOC0010-1.html>.

¹⁴⁹ See http://www.ulg.ac.be/cms/a_16290/interface-entreprises-universite and <http://www.interface.ulg.ac.be/>.

The overall objective of EE at ULg is to support students in developing and implementing entrepreneurial activities. This also applies to curricular offers. The key vehicle towards this objective is the creation of an entrepreneurial ecosystem at the University. ULg's approach is to seek establishing long-term relationships between students and the ecosystem, covering not only the period of education but also extending to entrepreneurial activities after students completed their study programme.

Key curricular offer: Master programme HEC-ULg Entrepreneur

The **flagship** programme for EE at ULg is the Master-level **HEC-ULg Entrepreneurs programme**, which is bilingual (French and English). It has the explicit objective of developing entrepreneurial skills and is characterised by practical learning and teaching methods. The Entrepreneurs programme includes courses and business co-operation. The number of students in the Entrepreneurship programme is limited because the pedagogical approach and related coaching activities are resource intensive. Existing resources allow for a capacity of about 30 students per year.

Business co-operation in the Entrepreneurs programme

The programme involves extensive contacts and co-operation with businesses, for example through in-company missions. Students work in interdisciplinary teams, which include students of management, engineering, law, and/or other backgrounds, on real projects, connected directly to the entrepreneurial community of the region and coached by professionals and entrepreneurs. Five juries in a total of about a hundred professionals assess the project presentations of students at the end of the taught units.

In addition, during a six-week "Right-Hand-Man" mission, individual students are shadow a company director every day and learn about his or her life as an entrepreneur. Finally, as part of a project, students are provided with the opportunity of developing their own business, coached by an experienced entrepreneur.¹⁵⁰

Courses in the Entrepreneurs programme

The HEC-ULg Entrepreneurs programme includes various courses for developing entrepreneurial skills. In the **Business Creation** course (five weeks), students work on a business-creation project. This course is supported by Sowalfin, the Walloon SME finance and guarantee company (in French: Société Wallonne de Financement et de Garantie des Petites et Moyennes Entreprises). Supervised by a mentor, student teams must draw up a comprehensive business plan detailing all aspects of a real creation: testing and validating the idea, establishing a management team and organising human resources, studying the market and competitors, deciding on the financial model and the strategy, registering the establishment as a legal entity, and developing a comprehensive financing dossier.

Another course is **Business Takeover and Transfer**. It involves teams of students to determine the conditions for the sale or purchase of a successful business and the development of a business plan for the future enterprise under the supervision of a specialist in sales and acquisitions (five weeks, November – December).

During the course **Sale and Negotiation** (two weeks, December), participants are split up across different points of sale within the EuroCenter network, a retail store chain.¹⁵¹

The **Growth Strategy** course (eight weeks, January – February) involves, first, to draw up an (e)valuation of a business company and, second, decide on a strategy for growing or repositioning the enterprise or a part of its activities.

Finally, students can voluntarily choose "**Marketing**" and "**Development of an Individual Project**" as course units.¹⁵²

Further important element: Master programme in Creativity

The Master of Creativity is an executive master programme with 60 credit points according to the European Credit Transfer and Accumulation System (ECTS). It is organised around the

¹⁵⁰ See <http://www.hec.ulg.ac.be/en/HEC-ULg/programs/business-school-programs>.

¹⁵¹ See <http://www.eurocenter.be>.

¹⁵² See http://www.hec.ulg.ac.be/en/students/becoming-entrepreneur_7151.

themes of understanding the creative economy, inspiring and initiating creative services, building creativity and implementing creative ideas in a project context.

Entrepreneurship education at PhD level

Entrepreneurship education at ULg is also firmly established at the PhD level. At the end of 2014 there were two doctoral seminars in the field of entrepreneurship. First, the **Doctoral Seminar in Entrepreneurship**, run by Prof. Bernard Surlemont, provides students with insights into the major theoretical subjects in the field of entrepreneurship. It also examines the methodologies used in this area. Students learn about various perspectives, examine different methodologies, explore some original empirical research and make connections between theory and empirical research. The pedagogical approach implies student presentations and interactive discussions.¹⁵³

Second, the **Doctoral Seminar in Social Entrepreneurship**, run by Prof. Sybille Mertens & Prof. Benjamin Huybrechts, focuses on the social enterprise and social entrepreneurship. Based on the critical analysis of theoretical and empirical literature, students become acquainted with several research avenues in the field. They are then asked to locate their own research project regarding the extant literature and to discuss their upcoming research agenda with the teachers and the other students.¹⁵⁴

Entrepreneurship education at Bachelor level

At the bachelor level, the learning outcome "creativity and entrepreneurial spirit" is embedded in the overall learning outcomes for the programme. Furthermore, all students participate in a business game, where they have to manage a small enterprise. Finally, there is the course "Introduction to Entrepreneurship" which is an elective for the "Economics in Management" degree.

Methods and media

HEC-ULg implements an active learning approach, which is based on real cases and project-oriented teaching at the Master level. It encourages students to take part in national and international competitions. Especially noteworthy is the support to so-called junior companies, run by students and coached by members of faculty through HEC service facilities: HEC Consulting Group, HEC-ULg Investing Group, and HEC-ULg Advisory.¹⁵⁵

9.2.4. Setting of entrepreneurship teaching

Locations

Entrepreneurship teaching and learning either takes place in lecture halls and classrooms or, if it is practical work in companies, on the premises of the co-operating enterprises.

Timing

All EE courses are normally offered each study year. Some last several weeks, others take the whole year. Sessions normally take several hours per day, no matter whether it is classroom work or visits to external places.

9.2.5. Instructors: teachers and mentors

Academic staff of the university

There are only a few professors teaching entrepreneurship at ULg. Most courses are taught by Bernard Surlemont who is the Professor of Entrepreneurship and also Academic Director of the Master HEC-ULg Entrepreneur and Director of VentureLab.

Professors Sybille Mertens (Chair of Social Entrepreneurship) and Benjamin Huybrechts (SRIW-Sowecsom Chair of Social Economy Management) are responsible for the topics of social economy and social entrepreneurship.

"Real entrepreneurs" as teachers

¹⁵³ See <http://www.edtgestion.hec.ulg.ac.be/?q=7&course=31>.

¹⁵⁴ See <http://www.edtgestion.hec.ulg.ac.be/?q=7&course=37>.

¹⁵⁵ See http://www.ulg.ac.be/cms/c_45415/les-atouts-de-hec-ulg.

At ULg, entrepreneurship education to a large extent involves outside practitioners: they take over approximately 90% of teaching. The remainder of 10% of EE activities are taught by faculty members. The external teachers are experienced and successful entrepreneurs. VentureLab involves three entrepreneurs in residence, i.e. entrepreneurs who have office space and a contract with VentureLab for teaching at HEC-ULg.

Mentors

Mentoring is considered an essential component of entrepreneurial education at HEC Liège. It is performed by experienced entrepreneurs and organised through VentureLab.

9.2.6. Management of entrepreneurship education

Teacher and trainer management

The choice of teaching staff is based on several selection criteria, including relevant experience and systematic student feedback. The teaching staff does not receive any training, but is involved in a comprehensive **mentoring system** with members of the faculty. Mentors are following seminars on mentoring techniques.

Managing student support

As of 2014, the University of Liège introduced a new category of student status, the **student entrepreneur**. The idea behind the student entrepreneur status is analogous to a special status some universities award to students who are, at the same time, pursuing sports or artistic activities at an international level. The student entrepreneur involves an officially recognised special student status that enables the students increased flexibility during the period of their studies. This new status is targeted at students wishing to start a new enterprise and provides those students with specific advantages and support in their pursuit of a study programme, for example by offering them to do parts of their studies through projects related to their start-up, increased flexibility in exam scheduling, providing infrastructure in terms of special access to the services provided by VentureLab, tutoring and coaching facilities through specialists linked to VentureLab, privileged access to the university's incubator and advice. They also have preferential access to study guidance services ("Guidance etude") and employment support ("ULg Emploi"). They are especially supported by the co-ordinator for student living quality and have special arrangements in terms of scheduling their exams or practical projects. The new status was initiated by HEC-ULg and approved by the ULg's Administrative Council. Students can apply for this status for a period of twelve months and later renew the status.¹⁵⁶

The decision about the status of student entrepreneur is left with a committee consisting of representatives of the University, faculty and entrepreneurs. So far there have been thirteen applicants, eleven of whom have been accepted by the committee. Two applicants were rejected based on lack of motivation.

Student entrepreneurs are coached through the VentureLab and the University's non-profit incubator.

Internal and external network management

The HEC Alumni organisation maintains close relationships with alumni with regard to their role as parts of the ULg's entrepreneurial ecosystem. However, the most important factor for maintaining relationships related to EE are networking activities organised and managed by Bernard Surlemont.

¹⁵⁶ See http://www.ulg.ac.be/cms/c_4164841/en/l-ulg-adopte-un-nouveau-statut-d-etudiant-entrepreneur?hlText=entrepreneur&hlMode=exact&hlText=entrepreneur&hlMode=exact&hlText=entrepreneur&hlMode=exact, http://le15jour.ulg.ac.be/jcms/c_46633/fr/quand-dji-vou-dji-pou, http://www.ulg.ac.be/cms/c_4168566/fr/les-avantages-du-statut-etudiant-entrepreneur-ulg, http://www.ulg.ac.be/cms/c_4135247/fr/etudiant-entrepreneur-ulg, and [http://www.ulg.ac.be/cms/c_4168475/en/la-commission-etudiant-entrepreneur-ulg?hlText=entrepreneur&hlMode=exact&hlText=entrepreneur&hlMode=exact&hlText=entrepreneur&hlMode=exact](http://www.ulg.ac.be/cms/c_4168475/en/la-commission-etudiant-entrepreneur-ulg?hlText=entrepreneur&hlMode=exact&hlText=entrepreneur&hlMode=exact&hlText=entrepreneur&hlMode=exact&hlText=entrepreneur&hlMode=exact).

In terms of international outreach, the ecosystem involves an informal network of academic institutions from France, Switzerland and Finland, mainly for the purpose of sharing experiences.

Management of curricular integration and attracting new groups of students

Curricular integration of entrepreneurship courses is most advanced in management school programmes. For other faculties, entrepreneurship education is on a voluntary basis.

Evaluation of courses and programmes

The development of the flagship programme (HEC Entrepreneurs) involves a focus group which involves representatives from the School, former students, entrepreneurs and two external academics. A commission is responsible for the redesign of the programmes. In terms of key performance indicators, the activities are measured by looking at the number of start-ups and job creation in the respective start-ups.

Management of continuous education

Recent graduates – up to two years after graduation – are offered the possibility to obtain support for their entrepreneurial activities from VentureLab.

Formal evaluation of learning outcomes

The assessment of and feedback to students with respect to EE is organised around three pillars: First, a jury consisting of practitioners assesses project presentations delivered by the students. Second, Bernard Surlemont and other assistants assess project report documents. Third, there is usually a written final examination.

9.3. Extra-curricular activities related to entrepreneurship education

Overview about extra-curricular EE activities at ULg

Extra-curricular activities are an important part of entrepreneurship education and the entrepreneurial ecosystem at ULg. Activities include the “entrepreneurial passport” for incentivising participation in such activities, such as an “opportunities café”, an entrepreneurs club and the “corner of opportunities”.

Relationship between curricular offers and extra-curricular activities at ULg

The master-level HEC Entrepreneur programme does not involve any extra-curricular activities, as the projects themselves require extensive time beyond what would be considered normal in academic programmes, requiring the full engagement and involvement of students.

“Entrepreneurial passport” for incentivising participation in extra-curricular activities

A relevant offer to all students from all faculties is the **entrepreneurial passport**, which students of any faculty can receive once they have accumulated a sufficient number of points. Points can be obtained by participating, for example, in extra-curricular entrepreneurial events, courses, and activities organised by the incubator, by participation in entrepreneurial conferences and by participating in the activities organised by the junior entrepreneurs. Depending on the number of points, a bronze, silver or gold certificate is awarded by HEC Liège. The intention of this passport is to encourage students to become involved in entrepreneurial activities and to compensate students for their input in those activities. For students, the entrepreneurial passport can be useful in the application processes to signal entrepreneurial spirit and engagement.

Further extra-curricular activities

At a very basic level, there exists an “**opportunities cafe**” which allows students to meet entrepreneurs and involves presentations from external experts.

9.4. Institutional aspects of entrepreneurship education

9.4.1. Organisational set-up and change

Organisational implementation

EE at HEC-ULg follows a centralised organisational approach. Academic resources concerning the entrepreneurial ecosystem are organised from within the management school. VentureLab's aim is to receive a budget covering three years, for example through private fundraising and European Union funding. The VentureLab itself is run as a non-profit organisation, with the involvement of the management school and educational institutions of the Province of Liège and Luxembourg.

In terms of governance, several stakeholders are involved. The Rector represents the University, while the regional high schools are represented by their directors. In addition, entrepreneurs (Mr. Brogniez, Mr. Woitrin and Mr. Pire) are represented on the VentureLab's board. Funding is partially secured through financial support from private and public institutions (see above).

Measures for coordinating and integrating EE across the university

Entrepreneurship education, while supported by the rectorate, is usually initiated, implemented and co-ordinated by members of the management school HEC Liège, and here especially by the group led by Bernard Surlemont.

Managing the acquisition of resources

The University funds a chaired professorship and university assistants in the field of entrepreneurship, which represents the labour input into entrepreneurial education. There is no specific additional budget available for entrepreneurship education.

9.4.2. Laws, statutes and codes

Incentives for staff to engage in or support entrepreneurship education

There are no specific material or immaterial incentives for staff to engage in entrepreneurial education.

9.4.3. Mindsets and attitudes

Raising awareness for the importance of entrepreneurship

Bernard Surlemont's mission and the intention of all EE activities at ULg is to raise awareness for the importance of entrepreneurship among all stakeholders of the university and beyond, including students, faculty, administration, alumni, and co-operation partners.

The idea of the VentureLab ecosystem is based on three pillars:

- (1) A set of **coherent actions** which reinforce each other and fit together, including events for raising awareness, teaching for education, student-entrepreneur status to be more flexible with studies, and incubation. "Hardware" for incubation is provided in the form of co-working space and "software" through coaching by entrepreneurs in residence.
- (2) A **culture of "responsibility"** which HEC-ULg wants to instil in its students. HEC-ULg seeks passionate students who take the steering wheel of their life and project and make sure that the "incubee" does not expect "cocooning".
- (3) A strong articulation with the regional ecosystem that supports entrepreneurship. The mission is also to guide students and provide a bridge from the VentureLab to all other activities and devices that can support entrepreneurship in the region.

Encouraging entrepreneurial behaviour

All EE activities at ULg aim at emphasising the relevance and importance of entrepreneurial activities and the University's support of entrepreneurship. Apart from the ecosystem's many activities in this respect, the recently established status of student entrepreneur may be particularly innovative and noteworthy.

9.5. Outreach to external stakeholders of entrepreneurship education

The HEC-ULg Management School manages the University's entrepreneurial ecosystem in close cooperation with external partners. The ecosystem maintains close links with numerous institutions:

- Enterprises: e.g. RTL GROUP.
- Financial institutions: e.g. SOWALFIN.
- Support services: e.g. CIDE-SOCRAN.
- Incubators, accelerators, science parks and technology parks: e.g. LEANSQUARE.
- International partners: Venturelab.ch in Switzerland and Start-Up Sauna in Finland.

CIDE-Socran is a particularly interesting case, as it is a spin-off company initially established by Bernard Surlemont, who is still a member of the Board. CIDE-Socran is a non-profit organization engaging in coaching and consulting activities, especially marketing strategy as well as commercial and financial management. Its Board includes representatives from ULg, the Walloon region, public investors and large private companies. CIDE-Socran is involved in a partnership with the HEC entrepreneur programme. It provides projects, three to four colleagues for mentoring, and lecturers for teaching. It benefits from the relationship as it recruits up to two HEC entrepreneurship graduates per year.

9.6. Impact and lessons learned

9.6.1. Evaluating impacts of the entrepreneurship education approach

Overview of impact evaluation methods applied

At the programme level, HEC-ULg systematically measures intended learning outcomes with respect to entrepreneurial spirit in the master thesis. In addition, there are annual student and lecturer feedback surveys, which form part of a feedback loop connected to HECs strategy.

As the entrepreneurial ecosystem organised around and formalised through VentureLab is in the process of being firmly established, a more thorough evaluation system is currently in the process of being developed. According to Bernard Surlemont, it is part of the "to do list" to measure the impacts of the VentureLab.

The HEC's Dean, Wilfried Niessen, stated that HEC is currently developing a balanced scorecard, which will also include references to educational elements of innovation and entrepreneurship. However, this will not only focus on entrepreneurship in the narrow sense but also include social entrepreneurship and intrapreneurship. A Business School Impact Survey will measure the number of start-ups, professional networking activities, job creation related to university spin-offs and the position and organisation of alumni.

9.6.2. Lessons learned

Summary of lessons learned from this case

The case of ULg-HEC highlights several points about critical success factors and contingencies in relation to entrepreneurial education, which can be divided into three categories: administration, teaching, and resources.

(1) University administration and intra-university relationships

At ULg as well as at other full universities, the establishment and operation of activities related to entrepreneurial education faces the challenge of a cultural gap or distance between the bureaucratically organised public administration and the entrepreneurial spirit and culture of the entrepreneurial activities. In public administration, decision-making processes are lengthy and time-consuming; and they require the signatures of several actors. Entrepreneurs are not used to these constraints and perceive them as restrictions that affect their performance negatively.

In addition, the independence of the different faculties requires effective co-operation between all organisational units involved, despite potential differences in academic approaches and

philosophies. In the case of ULg, this relates to initial scepticism EE was facing at the medical and natural sciences faculties.

At ULg, the issue of a cultural gap between EE activities and public sector governance structures is also visible. However, several factors can moderate potential tensions and frictions. First, ULg-HEC as a faculty is fairly autonomous within the university (governance) system with respect to strategy development, decision making, budget allocation and personnel decisions. Second, aspects of EE are firmly embedded within the mission statement and the teaching strategy of HEC-ULg. And, last but not least, HEC's Dean is very supportive of EE activities as he is an entrepreneur himself and is involved in EE activities of the ecosystem.

(2) Teaching- and curriculum-related factors

The integration of curricular and extra-curricular activities involves a number of challenges. In comparison to "management science" courses, entrepreneurship education may face the challenge of being based less on theory and empirical research, and focused more on practical, hands-on activities. While this may increase employability and chances of setting up a company; the nature, content and approach of EE may vary significantly from the more academically oriented management courses.

In relation to the European Credit Transfer System as well as with respect to the accreditation of the programmes, aspects of assessing outcomes and workload of EE-related courses may present a challenge.

(3) Personnel and resources

In the case of HEC-ULg, most entrepreneurial activities are initiated, implemented and co-ordinated by the network of people around Bernard Surlemont. This highlights the importance of individual persons and networks for the success of entrepreneurial education.

Transferability to other universities

In terms of evaluation of the venture lab ecosystem, HEC-ULg considers the model as "100% transferable". It does not involve specific resources or preconditions. However, from an outside perspective it seems that a strong personality with a long experience and a wide network contacts, such as Bernard Surlemont, would need to be in place to run similar activities.

References

Research for this case study was conducted by Stefan Zagelmeyer, Manchester Business School, on behalf of empirica for the study “supporting the entrepreneurial potential of higher education” (sepHE). Sources and references used include desk research plus:

Interviews

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- Hubert Brogniez, Managing Director VentureLab, Entrepreneur in Residence, HEC-ULg, 29 September 2014, telephone interview, and 21 April 2015, personal interview on site in Liège.
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10. Linz University, Austria: Inspiring teaching and a support network for academic entrepreneurs

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Abstract



The main hub for entrepreneurship education at Johannes Kepler University Linz (JKU), Upper-Austria, is the university's Institute for Entrepreneurship and Organisational Development (IUG). Entrepreneurship teaching is delivered by the IUG team and an established network of external lecturers. The institute's landmark approach to delivering entrepreneurship to students from all faculties entails a concentrated portfolio of courses in entrepreneurial management based on real-world entrepreneurial challenges for students to learn from. These courses are offered in cooperation with university patent scouts and academic entrepreneurs (the "patent-based business planning" and "innovation lab" courses are highlighted in the case). The flexible integration of external lecturers enables: a) offering a sustained hands-on entrepreneurship teaching in concert with IUG staff and, since it is based on the same people, b) a seamless coaching of potential entrepreneurs from the university within a network of regional start-up support and incubator institutions in Upper-Austria.

Case study fact sheet

▪ Full name of the university and location:	Johannes Kepler University; Linz (Austria)
▪ Legal status (e.g. public or private)	Public
▪ Location (if applicable: branches):	Linz (Upper- Austria)
▪ Year of foundation:	1966
▪ Number of students:	Approx. 19.000
▪ Number of employees (broken down by teaching, research and administrative staff):	1782 academic employees and 894 non-academic employees (no distinction is made between teaching and research staff). Third-party employees of the above: 499 academic employees and 194 non-academic employees (2013)
▪ Budget in most recent financial year:	Allocated budget issued by the federal government in 2013: 98.6 million euro
▪ Academic profile:	JKU hosts four distinct faculties: Social Sciences, Economics and Business (SOWI); Law (RE); Engineering and Natural Sciences (TN) and – since March 2014 – also Medicine (MED) (see: http://www.jku.at/content/e213/)
▪ Entrepreneurial profile:	Entrepreneurship education at JKU is delivered through the university's lead institute "Institut für Unternehmensgründung und Unternehmensentwicklung" (IUG; Institute for Entrepreneurship and Organisational Development); the institute has won the EC's European Enterprise Award 2010 "Promoting the Entrepreneurial Spirit"
▪ Activities focused in this case study:	Design of curricular entrepreneurship teaching – in particular "patent-based business planning" and "innovation lab" courses; regional support network for coaching individual entrepreneurs from university
▪ Case contact person(s):	Norbert Kailer; Director IUG / Professor of Entrepreneurship JKU

Information included in this case study is from end of year 2014 unless stated differently.

10.1. The university's entrepreneurship education profile

10.1.1. The university's overall approach to entrepreneurship education

Johnannes Kepler University (JKU) in Linz, the capital city of the Austrian province of Upper-Austria, follows a fairly concentrated approach towards entrepreneurship education (EE) around its "Institut für Unternehmensgründung und Unternehmensentwicklung" (IUG; Institute for Entrepreneurship and Organisational Development; <http://www.jku.at/iug/content>). The institute is domiciled in the Faculty for Social Sciences, Economics and Business (SOWI).

Norbert Kailer, professor of entrepreneurship, is the head of the Institute. One characteristic feature of the approach is to operate core EE activities through a small team of IUG teaching staff (10.2.5) in close co-operation with a substantial number of external lecturers from entrepreneurship practice, such as start-up consultants from private business and public service institutions, incubator and technology managers, as well as academic entrepreneurs (10.5.2). This allows IUG to pursue a (necessarily) resource-efficient approach and, at the same time, to implement its philosophy of giving entrepreneurship students access to real academic entrepreneurs and to people providing advice and material support to new venture projects at JKU and in the region of Upper-Austria. Regarding EE, the strategy enables IUG to offer the following:

- A rich curriculum of hands-on entrepreneurial management courses.
- Further extra-curricular activities, in particular platforms for networking and exchange between potential student and graduate entrepreneurs, alumni entrepreneurs, and professionals in start-up support in Upper-Austria.
- A chain of individual start-up support and coaching for university members interested in setting up their own business.

For its continuous efforts to establish and advance academic entrepreneurship in Upper-Austria, the IUG team has won the European Commission's "European Enterprise Award 2010 – Promoting the Entrepreneurial Spirit".

The following **case has two main aspects** centred on entrepreneurship teaching at the IUG in concert with its internal and external co-operation partners for entrepreneurship at JKU. The *first* focus is on the design of curricular EE offers made by the IUG in entrepreneurial management and business planning, in particular two courses where student teams do the following:

- a) Develop their own business ideas based on JKU patents from engineering and science (the "Patent-based Business Planning" course for business students);
- b) Work on solving practical entrepreneurial management problems in co-operation projects with academic entrepreneurs who bring these management challenges from their ventures right into class (the "Innovation Lab" course for master students from science and engineering) (for a detailed discussion in the case see 10.2.3 below).

The *second* focus is on the set-up of the above chain of support with EE at the individual level. The case explores the path from entrepreneurial learning in class towards pursuing one's own business idea within the support infrastructure set up by the IUG and regional players dedicated to entrepreneurship. Additional discussion and teaching materials on entrepreneurship at JKU published by IUG staff can be found, e.g., in Kailer (2000, 2010a, 2010b, 2012), Kailer and Gutschelhofer (2002), Kailer et al. (202, 2013, 2014), Kailer and Weisz (2014), Kailer and Wimmer-Wurm (2012), Wimmer-Wurm et al. (2013).

10.1.2. Leadership and governance

Importance of government strategies

Since the entrepreneurship professorship rooted from an endowed chair, national government funding programmes did not play an important role in the beginning. However, the Federal Ministry for Transport, Innovation and Technology (BMVIT) with its Impulse Program "AplusB – Academia plus Business" (www.apusb.biz) has fostered the establishment of high-tech incubators in the main regions of Austria, one of which – the Upper Austrian High Tech

Incubator "tech2b" (www.tech2b.at). – is located in Linz, catering for the region of Upper-Austria. The university is one of the shareholders (amongst other regional higher education institutions), and staff from the incubator is part of the network co-operating with the IUG. The IUG as "training partner" of the tech2b incubator offers a range of extra-curricular networking activities in cooperation with tech2b.

In 2014, JKU – together with other universities in Upper Austria, Salzburg and in Tyrol, obtained grants from the Federal Ministry for Science, Research and Economy (BMWFW) to establish a centre for knowledge transfer with regional co-operation partners ("WTZ WEST"; Wissenstransferzentrum West; see 10.4.1). This is also important for IUG's entrepreneurship teaching since one core element of the centre will be to further develop and scale IUG's patent-based business planning course as a means of technology transfer. The IUG as well as JKU patent scouts are involved in this project.

Importance of entrepreneurship in the university's strategy

The IUG itself originated from an endowed chair (the first of its kind in Austria). Entrepreneurship had been discussed in the region of Upper-Austria and its capital Linz around the turn of the millennium with the desire for JKU to establish education offers in this field. After singular EE courses and symposia in 1999 (Kailer et al. 2000), from 2000 to 2003 an endowed chair was sponsored by the Government of Upper Austria, the Town of Linz, the Chamber of Commerce Upper Austria and Bank Austria (Gutschelhofer/Kailer 2002). The IUG became a regular institute funded by the university in 2003. Within this organisational unit, EE has been understood broadly with offers not only for students from the Faculty of Social Sciences, Economics and Business (where the IUG is located) but also for students from other faculties, in particular Science and Engineering, where a line-up of course offers has evolved over time (10.2). As expressed by the Vice Rector for Research, the University's main task for support in terms of entrepreneurship within the domain of science and engineering is to fill the pipeline for technology utilisation and potential start-up projects in particular – and the EE activities targeted at the Faculty of Engineering and Natural Sciences are an important vehicle for this.

In the JKU development plan 2013-2018, six fields of excellence have been defined. The excellence field "Management and Innovation" includes four areas, one of them "Entrepreneurship in the Economy and Public Administration" (Entrepreneurship in Wirtschaft und Verwaltung).

Level of faculties' and units' autonomy to act

The IUG and its staff act fairly independently, in particular in terms of defining contents of EE. However, entrepreneurship teaching delivered by the institute takes place in a context of education regulation and a resource setting, which reportedly seems to impact on the design of the entrepreneurship course portfolio and individual start-up coaching (see 10.2.6 and 10.4.1).

Organisational implementation

As introduced above, the university organised entrepreneurship and its teaching in a concentrated structure around the IUG in a magnet approach as the place to go to for those interested in entrepreneurship on campus. This is in terms of delivering EE to different target groups of students, as well as for the operation of the IUG StartUp Center as a point of contact for potential entrepreneurs. Both are funded from the resources of the IUG.

University's importance for driving entrepreneurship in its environment

Generally, JKU has a substantial impact on the labour market of the region. An alumni survey conducted by the IUG indicated that around three-quarters of all graduates start working in the region of Upper-Austria (Kailer et al., 2012). Regarding entrepreneurship itself, the GUESSS Survey 2013 (Global University Entrepreneurial Spirit Students' Surveys) administered for Austria by the IUG shows that more than one fifth of students in current generations intend to become entrepreneurs five years after finishing their studies (Kailer et al., 2014 - for a discussion of these surveys and further literature, see <http://www.jku.at/iug/content/e55642>). An overview of actual business start-ups and succession projects by former IUG entrepreneurship students and graduates can be found at <http://www.jku.at/iug/content/e49536>). In addition, the Institute also aims at developing potential career paths for students to work in professional services and public institutions that are involved in consulting, coaching, and funding start-ups and promoting business succession.

In fact, many of the external lecturers and actors from regional institutions that support entrepreneurship were associated with the IUG before as graduates or members of university staff.

10.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

Essentially, the university people substantially involved in entrepreneurship teaching come from the IUG. The institute has only four members of internal teaching staff (10.2.5). In addition, it co-operates with (alumni) entrepreneurs involved in teaching (10.2.3; 10.2.5) and a number of external lecturers who teach a significant share of regular courses, often in team teaching with internal instructors. Internal teaching staff has substantial experience in business and further education, in particular competency development.

Financial resources for entrepreneurship education

The main part of financial resources for EE is reflected in the personnel budget consisting of the members of IUG staff (four teaching and research staff, one administrative). In view of this somewhat challenging resource base for delivering high-quality university-wide entrepreneurship education (and the specific challenges posed by temporary employment of mid-level teaching faculty), the Institute aims at adding to its funding by acquiring grants to pursue additional research and teaching projects (see <http://www.jku.at/iug/content/e55642> on IUG’s third-party research projects and the section on managing resource acquisition in 10.4.1).

10.2. Entrepreneurship in curricula and teaching

10.2.1. Overview of curricular offers

Curricular EE at JKU is provided by IUG teaching staff and the institute’s network of external lecturers (10.5.2). Teaching staff deliver a range of different entrepreneurship courses and seminars to different target groups (10.2.2). The line-up of courses in the entrepreneurship specialisation for bachelor (and diploma) students from the Faculty of Social Sciences, Economics and Business follows a straight-forward structure of compulsory introduction courses (entrepreneurship and business development; Unternehmensgründung und -entwicklung), seminars (SE) and electives (Intensivierungskurse; IK), in particular in Business Planning, Entrepreneurial Finance, and Business Development and Succession.

A specific feature of EE at the IUG is the persistent focus on “practice-oriented”, hands-on EE activities (see the sections on learning objectives and course design in 10.2.3). For example, there is an array of courses in business planning and entrepreneurial management where students develop business ideas and solve challenges in “real life” start-up management. Frequently, course work in the intensive courses (IK) unfolds together with the entrepreneurs facing these challenges in their start-up firms or with JKU’s patent scouts (“Patentscouts”).

The case study focuses on two of these elective intensive courses (IK) – **Patented-based Business Planning** (“PATENTes Business Planning”¹⁵⁷) and **Innovation Lab**. The latter is offered for science and engineering students in the Law and Business Master’s degree programme (“Master Recht und Wirtschaft für TechnikerInnen”). In the following sub-chapters, different aspects of curricular EE at JKU will be highlighted along these two extensive entrepreneurship courses and supplemented with additional insights into the curricular approach of the IUG towards entrepreneurship teaching. The table below provides a general overview of curricular EE offers at JKU.

Exhibit 3: Overview of curricular EE offers at JKU Linz

No.	Name	Objectives	Target group	No. of participants in [year2013]

¹⁵⁷ “Patent” also means smart or ingenious in German language.

1	Introduction to Entrepreneurship and Organisational Development	Introduction to entrepreneurship, start-up and development of enterprises	Bachelor students (SOWI: social sciences, economics and business studies)	approx. 200
2	Entrepreneurship and Business Development	<p>KS 1: The course aims at providing students with tools to establish their own business and pursue self-employment.</p> <p>KS 2: The course focuses on entrepreneurial finance and is designed to help to make better investment and financing decisions in entrepreneurial settings. The objective also aims to foster the understanding of theoretical concepts with regard to Corporate Venturing and Start-up Financing.</p> <p>KS 3: the final course in the specialisation provides general knowledge in corporate development with a focus on business succession</p> <p>In all courses the insight in entrepreneurial business practices is enhanced through guest lectures and networking activities.</p>	Bachelor and diploma students (social sciences, economics and business studies – SOWI)	450
3	IK 1 Business Planning (range of parallel courses)	Strategic business modelling, business planning, business idea presentation and evaluation	Bachelor and diploma students SOWI	150
4	IK 2 Entrepreneurial Finance	IK2 aims at preparing students for these decisions, both as entrepreneurs and venture capitalists. In addition, the course includes an in-depth analysis of the structure of the private equity industry.	Bachelor and diploma students SOWI	175
5	IK 3 Financial Planning	Preparation of a financial plan, valuation of a company.	Bachelor and diploma students SOWI	220
6	IK 4 Biz Kick	BizKick! (once a year) is a series of events that is organised in cooperation with the University of Applied Sciences Upper Austria, the Upper Austrian Chamber of Commerce and the Johannes Kepler University. Within a timeframe of six weeks, student teams have to find a business idea, to write a business plan and to put this idea into practice by generating first revenues. Course slogan: "Being an entrepreneur for one semester". The main purpose is to arouse the student's interest and awareness for self-employment and to illustrate the reality of entrepreneurial life	Bachelor and diploma students SOWI and TNF	25
7	IK 5 and 6	<p>IK 5 (once a year) is transfer-oriented and focuses on start-up management. Students get to know appropriate tools to elaborate, i.e. a strategy paper and also get involved in planning later implementation.</p> <p>IK 6: Specialised topics in entrepreneurship: i.e. legal aspects of business succession, sales training, competency development, crisis management in SME</p>	Bachelor and diploma students (SOWI)	50
8	Seminars in Entrepreneurship	In the Bachelor-Seminar as well as in Seminar 1, students work on current issues regarding the latest entrepreneurship research. The objective is to develop an academic paper that reflects the current state of research in the field of Entrepreneurship	Bachelor and diploma students SOWI	240

		In the final Seminar 2 advanced student teams work on theoretical themes and/or empirical surveys including presentations		
9	Innovation Lab	Evaluating business models, work on specific practical problems of real enterprises	Master students (Business and Law for engineering and science students)	30
10	Entrepreneurial Knowledge for Students from Science, and Engineering & Entrepreneurship in the Creative Industry	IK "Entrepreneurial Knowledge for students from Science and Engineering: The aim of this workshop-based course is to get to know basic knowledge in entrepreneurship. The inputs are attuned to founding a business in the engineering context. Teams of students work out a business plan. IK "Business development in the Technological Sector - from Innovation to Marketability": Based on lectures from experts and practitioners, students deepen their entrepreneurial knowledge on special issues like patents, business model development and entrepreneurial finance.	Bachelor and diploma students	75
11	Thesis writing seminar	Coaching for students writing a diploma or master thesis in entrepreneurship	Diploma and master students (SOWI)	25
12	Seminar and Colloquium for PhD candidates	Coaching (in cooperation with professors from other institutes) for students writing their PhD theses (in the field of entrepreneurship, SME, family enterprises, entrepreneurial finance, technology transfer and related fields)	PhD candidates (SOWI – not restricted to entrepreneurship)	25

10.2.2. Target groups

Main target groups of entrepreneurship education

Entrepreneurship teaching at the IUG targets the following groups in terms of the future career paths and overall employability (OeH, 2013; Kailer, 2012):

- Staff and students from JKU's four faculties with an interest in entrepreneurship, entrepreneurial business development or intrapreneurship;
- Students interested in business succession (e.g. in family business which is a backbone of the SME economy of Upper-Austria as one of the core industrial regions of the country);
- Students interested in working as so called "Gründungshelfende" (e.g. in start-up consulting and coaching in incubators, technology parks, consultancies, banks, chambers of commerce and industry, etc.);
- Alumni, in particular alumni entrepreneurs, to be integrated in on-campus EE (generally as guest speakers and role models and practically, e.g., in entrepreneurial management projects with JKU students in IUG's entrepreneurship specialisation courses).

IUG's approach thus goes beyond aiming exclusively at student and graduate start-up creation directly. Rather, the broader set of target groups also aims at contributing to the development of entrepreneurial mind sets ("instilling an entrepreneurial touch" as one of the interviewees put it) in indirect target groups who, later in their careers, might be in a position to support start-ups and entrepreneurship in society or act entrepreneurially in established organisations.

With regard to curricular and departmental segments, entrepreneurship at JKU is anchored in the curriculum of both bachelor and master degree programmes within the Faculty of Social Sciences, Economics and Business (SOWI). In numbers, more than half of the business and economics graduates choose the entrepreneurship specialisation provided by the IUG (160 in 2013). Furthermore, entrepreneurship is an elective for students within the Faculty of

Engineering and Natural Sciences (TN) where interdisciplinary courses also include students from the local University of Art and Design Linz (Kunstuniversität), addressing business planning in technology as well as creative entrepreneurship (approx. 50 to 100 participants per year).

Overall, EE at the university appears to be well tailored to the different target groups. This is particularly seen in terms of the following:

- *Students' background and degree studied*; e.g. in a business planning course for the above science, engineering and art students in comparison to courses for business students ("Unternehmerisches Wissen für Studierende der TNF & Selbständigkeit im kreativen Umfeld"; IUG, 2014);
- *Business competences and experience*; e.g. in hands-on entrepreneurial management courses where students work in teams and take roles according to their competences and prior experience so as to manage heterogeneity in class;
- *Profession*; for example, in extra-occupational master programmes where the time structure of courses is adjusted to professional part-time studies.

Continuous education

At the post-graduate level, the university offers several extra-occupational master degree courses ("berufsbegleitende Masterstudiengänge"). Entrepreneurship is an elective in JKU's General Management master and one of the compulsory subjects in the master programme in Law and Business for Science and Engineering (Recht und Wirtschaft). In the latter, the Innovation Lab course is offered (see 10.2.3 for details).

10.2.3. Designing lectures and courses – basic curricular decisions

Objectives

In relation to the target groups of EE, a general objective of entrepreneurship teaching at the IUG is the employability of JKU graduates through entrepreneurship as a career path ("Karriereoption Selbständigkeit" – self-employment as a career option). This also includes the intention to qualify start-up consultants and other professions involved in entrepreneurship policy and start-up support ("Gründungshelfende"). The corresponding prime objective is to develop entrepreneurial competencies in students ("unternehmerische Kompetenzen"; "Gründungskompetenzen"; Kailer, 2012; IUG 2013, 2013a). Practically, entrepreneurship qualification at Linz also aims at giving students access to the Upper-Austrian start-up and entrepreneurship network, in particular for students to personally get in close contact with experienced start-up consultants and people involved in the support infrastructure for entrepreneurship in the region (e.g. through the involvement of these external stakeholders in entrepreneurship teaching or at extra-curricular events like JKU's founders café ("Gründercafé") and the founders fair ("JKU-Gründermesse") (see 10.5.2 and 10.3.1 below).

At the level of individual courses, one overarching objective is the idea to familiarise students with concepts of entrepreneurial management and their application to practical start-up and business development problems through the students themselves. This is often in close co-operation projects with entrepreneurs and their ventures, e.g. in the focused **Innovation Lab** course but also in other courses such as the Business Planning course (IK 1) taught by Gerold Weisz, external lecturer and managing director of "akostart oö - Akademisches Startup Netzwerk Oberösterreich") – a regional Upper-Austrian pre-incubator for academic start-ups. Similarly, within the **Patent-based Business Planning** course, management students apply tools like the business model canvas to real patents from the university's Faculty of Engineering and Natural Sciences so as to develop and command application competencies within the tool box of entrepreneurial management instruments (IUG, 2013). Additionally, in both the innovation lab and patent-based business planning courses, students strengthen interdisciplinary teamwork and presentation competencies in comprehensive course elements throughout the semester.¹⁵⁸

¹⁵⁸ In both courses there are parts where direct feedback and reflective discussion of students' teamwork and presentations is integrated (e.g. in individual feedback sessions and investors' trade fairs where student projects are presented and evaluated – see the content section below).

Contents

The team of IUG entrepreneurship staff and its network of external lecturers teach entrepreneurship courses both for larger groups of 200 students and smaller classes from 25 to 40 students. The larger courses are typically the introduction courses which provide the fundamentals of entrepreneurial management and venture growth (necessarily) in a lecture-type format (Unternehmensgründung und -entwicklung; UG I-III; see 10.2.1 above) and also include guest speakers. Based on this, there is a differentiated teaching portfolio on offer for students in so called “intensive courses (IK)” (entrepreneurship specialisation courses) with formats strongly dedicated to practical aspects of entrepreneurial management (i.e. competency development, crisis management, business succession law, sales training, management of start-ups).

The IUG team puts substantial teaching resources in the IK specialisation range where courses are regularly offered in parallel to enable teaching formats with smaller groups of students. In particular, within the IK 1 Business Planning course students can choose from different course options – one of which is the patent-based business planning IK course discussed in more detail below. In addition, there are IK business planning courses taught by external lecturers from different areas of entrepreneurship practice.¹⁵⁹ In the course offered by Alexander Stockinger from the start-up service of the Austrian Economic Chamber (“Wirtschaftskammer Österreich”; WKO), students work in teams (seven teams of four students each), developing business plans from self-selected business ideas. The business ideas in the course may come from a range of industries, following the philosophy of the WKO to be open for start-ups from all sectors. Typically, students work with different institutions involved in regional start-up support, for example, in collecting market data and evaluating their business ideas. Similarly, in a business planning course taught by Gerold Weisz from the region’s academic pre-incubator institution “akostart”, students team up and work together with entrepreneurs from the akostart pre-incubator to tackle current management challenges in the ventures of these entrepreneurs (e.g. internationalisation or sales strategies).

Patent-based Business Planning

Students in the Patent-based Business Planning course are usually from the Business Administration department while the patents used in the course are from the Faculty of Engineering and Natural Sciences. The central idea of the course is for students to develop potential product or service applications based on the technical patents, build a business model, and plan for subsequent opportunity exploitation; examples are product and service ideas for flexible batteries (e.g. applicable in intelligent wear) and servicing of oil pipelines (based on a patent from mechatronics; Energy Harvester/ PipeSec¹⁶⁰). The course is taught by Birgit Wimmer-Wurm from the IUG in co-operation with patent scouts, typically young doctoral or post-doc scientists from engineering and science. The patents themselves root from inventions in basic research, often from physics and mechatronics. With around thirty participants in the course, students build teams and take on different team roles based on their competencies and personal interests (CEO; finance manager; infrastructure manager; marketing manager, and product manager). The course is structured in different phases and workshops, with students fulfilling different tasks throughout the semester.

Patent Workshop

The course kicks off with an introduction and a patent workshop (of approximately three hours contact time). Students organise their teams, choose their team roles, and each team picks a patent to be explored throughout the course. The patents will be presented by the patent scouts or the original inventors from the Engineering and Science Faculty and the student teams familiarise themselves with their patents (in a time slot of around 90 minutes). This element is both central and, at the same time, difficult for student learning in the course. Students need to explore and understand what the patent actually amounts to and what its advantage may be. For EE instructors, the presentation of patents by the scouts is a balancing act between telling

¹⁵⁹ IUG staff also developed course formats which go beyond just planning a new business. For example, in the Biz Kick course students develop their own business *and* put into practice on campus (in competing groups of students starting with a small amount of funding and the goal to make money from their business within five weeks).

¹⁶⁰ The PipeSec student team has been one of the winners in the Austrian i2b business plan competition in 2014.

just enough (in terms of exemplary practical applications of the patent the scouts may have in mind) and telling as little as possible to avoid students from developing too narrow a focus on the potential of a patent.¹⁶¹ At the end of the patent workshop, students summarise the basic points and issues of their patents on posters.

Creativity Workshop

As the next step in the course, in the following there is a creativity workshop. In the meantime students may and should discuss the patent and its practical potential with their relatives and friends. This feeds into the creativity workshop where the main task for students is to find possible applications for their patents. The workshop is usually operated in the Innovation Lab sprint domiciled at the Fachhochschule Wels (University of Applied Sciences Wels). Students use electronic whiteboards to create, arrange, rearrange, and discuss possible ideas for applications in areas of daily life like leisure, household, or sports (see the exhibit below). In this brainstorming phase for idea generation, the patent scouts will take a backseat, refraining from interfering with students' idea flow. The patent scouts will give their opinion on the two most promising application ideas for each patent in discussion with the student teams on the basis of their technical understanding of the patents (evaluation phase). These two possible applications will then be mapped out on posters by students, pinpointing the technical advantages of the patent in the envisioned application setting.

Business model generation

The two potential product or service applications undergo technology screening and preliminary market analysis before the teams delve into business planning for their favourite idea.¹⁶² To facilitate the planning process students develop a business model canvas (the tool is to be introduced by course instructors in a short input section). This enables students to explore interrelationships between the building blocks of the canvas from a holistic perspective of business models.¹⁶³ The student teams present their business model canvas concepts which will be discussed and evaluated in the course. In terms of formal output, student teams prepare business plan drafts, receive feedback from instructors, and submit their final versions at the end of the course after the investor trade fair (IUG, 2013). The business plans prepared in the course are submitted to a nationwide business plan competition ("i2b") where student teams from the course have achieved top ranks in the latest editions. In 2013, three out of five teams in the Austrian final round came from this course (<http://www.jku.at/iug/content/e49383>).

Investor trade fair (student presentations)

The investor trade fair is essentially a role play format in which students take on the dual roles of: a) entrepreneurs presenting their business idea and, b) investors making decisions on investing virtual money. The fair has a frame in which student teams aim at convincing investors in a ten-minute management presentation followed by a five-minute Q&A investment screening session before the teams make their investment decisions.

The overall concept of the course has developed over time. For example, the investor trade fair has started from what have been traditional classroom student presentations in the beginning. Also, the creativity workshop has been taken on board to give students more room to develop suitable application ideas (before that students jumped right into possible applications and business models after the patents had been presented by the patent scouts). Further improvements in the course are made from semester to semester by the instructors and the patent scouts involved in teaching.

Innovation Lab

In contrast to the patent-based business planning course, where the focus is on preparing a complete business plan, the innovation lab course (IUG, 2013a) follows a different approach. Students tackle practical entrepreneurial management problems in their team projects. These management problems stem from start-ups and young enterprises, for example from the akostart pre-incubator and tech2b high-tech-incubators in the region. Typically, though

¹⁶¹ In the course different approaches have been tried out over time: explaining the patent exemplified by possible applications and explaining the patent purely in technical terms (without reference to applicability, which, however, does not seem to benefit student understanding).

¹⁶³ In this phase, the nine building blocks of the canvas will be assigned to the different managerial team roles defined at the beginning of the course.

essentially set in the management arena, the problems also feature a technical perspective since students in the course usually have a strong technical background (that is in the university's master programme in law and business for engineers and natural scientists). It will be the entrepreneurs from the above start-up and young enterprises who present the management problems to students and function as role models of academic entrepreneurs. Entrepreneurs will stay involved throughout the course to work on and discuss possible problem solutions with their student teams. The course is facilitated by a member of staff from the IUG and an external business consultant who is with the tech2b incubator.

The course *kicks off* with students to build teams, entrepreneurs to introduce and present selected management problems in their start-ups, and the two instructors to provide input on the business model canvas tool. Familiarisation with this tool is essential since the student teams should appreciate and address not only their specific entrepreneurial management problems, e.g. developing a sales strategy for a start-up, but also the context of the overall business model of their assigned venture. And student teams – together with the founder(s) of the business – often come across interrelated management challenges that require additional attention.¹⁶⁴ In addition to the business model canvas as a “meta tool”, students receive input on more specific tools (e.g. from marketing or strategy) that they may want to use. In the *second session*, student teams present their business model canvases for the start-ups and management problems. The concepts will then be evaluated and discussed in due course while the course instructors give feedback to each of the student teams. In the *final session*, the final concepts will be presented by the student teams, including management implications and recommendations. The final management reports have to be submitted one week later to allow the teams to integrate received feedback from the presentations (see 10.2.4 regarding the formal evaluation of the course). The Innovation Lab course gives students the opportunity to work on “real-life” start-up and entrepreneurial management problems in close, hands-on co-operation with academic entrepreneurs and their ventures. At the same time, the entrepreneurs receive added value including the management suggestions provided by their student teams and the class.

Methods

In entrepreneurship teaching different methods and approaches for supporting the objectives of the respective courses are employed, for example:

- Student team work as a format to support participants' problem-centred learning in the Innovation Lab and other business planning courses in which students work on practical entrepreneurial management problems requiring different problem-solving competencies manifested in different team roles.
- Role play segments, e.g. in the investor trade fair at the end of the patent-based business planning course where students assume the roles of entrepreneurs and investors (and learn to navigate both the view of founders to present business ideas as convincing investment opportunities and the (critical) view of investors in the investment screening process).
- Developing students' competence profiles with a special method for competences diagnosis and development (KODE®) developed by Prof. Volker Heyse and Prof. John Erpenbeck.
- Practical training on examples of real business cases.

Media

Similarly, both electronic and traditional media are used to facilitate learning in the courses, for example:

- Electronic whiteboards (including multi-touch-sketching-walls) within Sprint Lab/ Front End of Innovation Lab – used in the patent-based business planning course (during the creativity workshop) to facilitate students' creative search for patent applications.
- Electrostatic flexible whiteboard sheets, which can be put on almost every hard surface and are used in the idea generation phase or at the end of the course for creative presentations.

¹⁶⁴ Course instructors, however, will make sure that the management problem is defined in a way compatible to students' course work.

- Traditional posters and flip charts, often at milestone points at the end of course phases and specific workshops for students to summarise and consolidate results of course sessions and as a preparatory input to proceed to the next step of their course work.
- “Moodle” as an electronic object-oriented learning platform on an open-source base to support course management and communication exchange.

Informal evaluation of learning outcomes and feedback for students

Evaluation of student learning and subsequent feedback to students is provided by different types of people in different informal course settings:

- *Students* (and *instructors*) in class: student presentations, e.g. of business models or solutions to management problems – feedback by fellow students and instructors as management issues will be discussed in detail including routes for further development or improvement.
- In bilateral meetings with *instructors*: options for individual feedback are integrated in the time schedule of the courses, in particular to receive feedback before specific course milestones are due (e.g. the management report in the innovation lab course).
- *Entrepreneurs* (involved in the courses): in the business planning courses where real management problems of start-ups are addressed, the founders and managers of these businesses offer discursive feedback to students’ problem analysis and their process to derive management implications.

In particular as students continue to refine their business idea beyond original course work (e.g. in the patent-based business planning course), there may follow a further feedback process, potentially on the route to real student or graduate entrepreneurial behaviour (see the section on student support in 10.2.6)

10.2.4. Setting of entrepreneurship teaching

Timing

For the two courses discussed in detail (but also for other course offers in the “Intensivierungskurs” segment), it stands out that course sessions do not follow a traditional format of a specific weekly contract time sliced into time slots of ninety minutes. Rather, sessions tend to be longer (often around half a day or even entire days) with less frequent meetings throughout the term. These extended course meetings are tailored to the contents and objectives of the sessions (e.g. to get students to familiarise themselves with the technical patents during the kick-off or for students to practice role play at the investor trade fair in the patent-based business planning course). Further, EE instructors emphasise the need to give students sufficient time to think through, for example, the patents they got introduced to or the feedback they received on their management reports during the patent-based business planning and innovation lab courses.

Formal evaluation of learning outcomes

In the formal evaluation process, a range of different student outputs will be marked, depending on the format and size of the course. The lecture-type introduction courses have an end-of-course written exam for capacity reasons. The courses in the entrepreneurship specialisation also formally evaluate student presentations of and interim reports on business plans, idea screening protocols and management concepts with a focus on the final versions of submitted business planning/ modelling and management papers (reflecting between 50% and 60% of the overall mark; IUG 2013 and 2013a).

10.2.5. Instructors: teachers and mentors

Professors, other employees and external lecturers of the university

There are different groups of instructors involved in entrepreneurship teaching at JKU: IUG staff, external lecturers, entrepreneurs, people involved in start-up support (“Gründungshelfende”) and patent scouts (<http://www.jku.at/iug/content/e49272>). The IUG is

the central unit at the heart of EE at the university. The IUG is headed by a tenured entrepreneurship professor. In addition, there are three lecturing and research positions ("UniversitätsassistentInnen") in entrepreneurship with fixed-term work contracts. IUG teaching staff has a background in management studies, business and economic education, and further education. The institute also integrates about ten external lecturers with two related strategic aims¹⁶⁵: a) to enhance the resource base for entrepreneurship teaching and, b) to involve entrepreneurship practitioners in teaching. The external lecturers are typically entrepreneurs or start-up/ business consultants and incubator managers from the Upper-Austria region as well as specialised experts (e.g. in sales training or finance). Also, the system of establishing a pool of external lecturers ensures continuity in teaching to some extent. This is important because internal mid-level teaching staff is employed only temporarily in the higher education system in Austria.

"Real entrepreneurs" as teachers

At JKU, business founders and entrepreneurs are a core element of entrepreneurship teaching beyond one-off guest lecture events. Rather, in the business planning specialisation courses, entrepreneurs and their current management challenges take centre stage (see 10.2.3 above). For example, in the business planning course offered by Gerold Weisz, the instructor brings around four to five entrepreneurs from the akostart pre-incubator into the course. For the student teams, the co-operation with the founders involves the development of a mutual understanding of the management problems raised by the founders at the outset of the course, working (sometimes on-site at akostart) on alternative problem solutions, as well as presenting and discussing their analysis, solutions, and recommendations for implementation¹⁶⁶. Occasionally, student internships and employment with the akostart ventures become an immediate output from the course.

10.2.6. Management of entrepreneurship education

Teacher and trainer management

The personnel development unit of JKU organises and operates a campus-wide programme for training of the university's teaching staff. The programme is compulsory for all new teaching personnel and thus not specific to entrepreneurship teaching. The course programme offers a tool box of didactic instruments and opportunities for building and improving lecturing competences (in interdisciplinary courses). In addition, there is a system of mentoring and peer-group visits of lectures/ seminars. This training is reported to be useful for teaching entrepreneurship because of its multi-faceted character with many different teaching situations and forms of interaction with students.

Managing student support

Managing the potential transformation from students of entrepreneurship in lectures and seminars towards students with a strong interest in becoming entrepreneurs is central to IUG's overall approach. To address the particular target group of students interested in founding their own business, to offer advice, and to organise extra-curricular activities for potential founders, the IUG has established a Start-Up Centre at JKU, situated within the institute (<http://www.jku.at/startup/content>; IUG 2014a). The extracurricular activities are specifically dedicated to offer a networking platform for potential founders and regional institutions providing start-up support and counselling. The activities run by the Start-Up Centre include, e.g., a regular founders café ("Gründercafé") with founders and "Gründungshelfende" - those who support entrepreneurship, a start-up fair ("Gründermesse"; organised with the Junior Chamber Upper-Austria ("Junge Wirtschaft")), a founders dialogue event ("Gründerdialog") and other formats (10.3.1).

The Start-Up Centre is led and operated by Christine Blanka, a post-doc researcher and lecturer in entrepreneurship from the IUG team. Since it operates on a fairly limited resource base provided solely from IUG's resources, the centre is primarily an initial, low-threshold contact point for JKU students and staff interested in founding a business. For academic venture projects in their very early stages, the centre provides information material and initial consulting

¹⁶⁵ The composition of the curriculum taught by external lecturers is adjusted by the IUG every semester according to teaching needs and available budgets.

¹⁶⁶ Reportedly, the EE instructor of the course takes a backseat, particularly in the analysis and discussion phases of the course.

(e.g. related to discussing the feasibility of business ideas and to issues in initial business planning).¹⁶⁷ Further, the IUG has established a network of close co-operation partner institutions within Upper-Austria for providing further start-up support to JKU members (10.5.2).

In particular, start-up coaching is provided by the akostart pre-incubator where the university is one of the shareholders of the academic incubator (together with other Upper-Austrian education institutions).¹⁶⁸ With regard to technology venturing, the Start-Up Centre offers a taught course on the basics of entrepreneurship for students from engineering and science and, in co-operation with the tech2b incubator, consulting for students envisioning a high-tech start-up project. More general advice and support is provided by the Start-Up Service of the "WKO Wirtschaftskammer Österreich". These instruments of start-up support are also tied back into EE and students' development of entrepreneurial competences with the employees of the WKO Start-Up Service, akostart, and tech2b involved in entrepreneurship teaching as external lecturers. Overall, the IUG and its start-up support network in the region offer a chain of shared support with the Start-Up Centre at the front of the gateway of entrepreneurship students in curricula and, subsequently, individual support for student and graduate start-ups within the above regional network.

A typical case comes from a team of students in the Patent-based Business Planning course who are currently at a crossroads between finishing their studies and establishing a start-up based on a business idea and patent from the course. The student team originally developed a product to measure snow loads (e.g. on roofs) in the construction sector. The business idea later migrated to a different area of application and the team still has to make key decisions as to if and how to further pursue the project. Currently, the students are in contact with their instructor from the course and have taken their patent scouts on board. Later the project may be moved to the tech2b incubator for further support.

Internal and external network management

The IUG has had positive experiences with endorsing university start-up support and students' learning about hands-on entrepreneurship (at the IUG and the Start-Up Centre) by bringing on board people from regional institutions who are also involved in entrepreneurship teaching. This enables JKU students to become familiar with opportunities for start-up advice and resource support. In terms of offering platforms for the integration of and communication between alumni (entrepreneurs), current entrepreneurship students and JKU staff, the extra-curricular founders café and fairs are a meeting point for all (including the regional "Gründungshelfende") and a platform for presentations and discussions with JKU academic entrepreneurs. These entrepreneurs are also part of the group of founders and start-ups integrated in the specialised business planning courses. Currently, the IUG is in the process of broadening this base of entrepreneurs by collecting data on its entrepreneurship alumni to track their careers and entrepreneurial behaviour.

Evaluation of courses and programmes

In addition to general university-wide course evaluation, the IUG pursues a non-formalised approach of ad-hoc evaluation of courses. Experiences and routes for further improvement are discussed on a semester basis between IUG staff as well as external staff, such as the patent scouts, external lecturers, and entrepreneurs involved in entrepreneurship teaching.

¹⁶⁷ Note that the personnel resources of the centre, which solely come from IUG's budget, are limited and thus only initial consulting can be offered. However, according to their specific needs, potential entrepreneurs are then transferred to the strong network of external support, in particular the start-up service of the Chamber of Commerce, the akostart pre-incubator and the tech2b high-tech-incubator.

¹⁶⁸ In fact, after the founding of akostart detailed and continuous coaching and counseling of individual start-ups moved from the Start-Up Centre to the pre-incubator.

10.3. Extra-curricular activities related to entrepreneurship education

10.3.1. Overview of extra-curricular entrepreneurship activities

JKU has established a range of different extra-curricular activities for the target groups of potential and actual entrepreneurs amongst students, graduates, alumni, and staff. The aims of these activities are: a) to provide a platform for communication, networking and co-operation around hands-on start-up, business succession and business development activities and, b) to support individual start-up and business venturing projects within the above target group community. Among these efforts to foster co-operation and start-up promotion, regional network partners around the university's IUG play an important role, for example in teaming up with the Start-Up Centre in consulting to individual entrepreneurs and as frequent participants in networking events like the "founders café" or "dialogue with entrepreneurs". The exhibit below offers an overview of the extra-curricular activities in entrepreneurship. Their relation to curricular education (which is the main focus of this case) and the relationships with regional network partners as external stakeholders are discussed in 10.2.6 and 10.5.

Exhibit 4: Overview of extra-curricular EE activities at JKU

No.	Name	Objectives	Target group	No. of participants in [2014year]
1	Founders Café	Networking event for (potential) entrepreneurs with other entrepreneurs and start-up consultants	Students, alumni and employees of JKU, entrepreneurs	250
2	Founders Fair	Networking event organised by the Junior Chamber of JKU, supported by IUG; information desks of consultants, Austrian Economic Chamber, banks, etc. (approx. 20 exhibitors)	Students, entrepreneurs and successors	250
3	Start-Up Centre	Initial consulting in the start-up phase; organisation of extra-curricular activities of the IUG	Students, alumni and employees of JKU	
4	Entrepreneurs Dialogue	Entrepreneurs reporting on their start-up activities	Basically students	
5	Business Plan Coaching and Start-up Consulting Days	Coaching with experts from tech2b and the start-up service of the WKOÖ (started in 2014)	Students, alumni and employees of JKU	15 appointments per year

In addition to the networking activities listed above, the IUG organises discussions with entrepreneurs within curricular courses or separated extra-curricular events (about 15-20 per year).

10.3.2. Details of extra-curricular activities

Extra-curricular activities are relevant for the university. They are, however not in the focus of the case. Extra-curricular activities which are important for the regional network in terms of supporting and coaching individual students, graduates, or staff planning to found a business are integrated in chapter 10.2.6 (e.g. IUG's StartUp Center and its activities).

10.4. Institutional aspects of entrepreneurship education

10.4.1. Organisational set-up and change

Measures for co-ordinating and integrating entrepreneurship education across the university

Since the IUG is the anchor of the university's magnet approach of entrepreneurship, the institute represents the central node in co-ordinating EE across JKU organisation.¹⁶⁹ The IUG and its curricular and extra-curricular activities are reported to be well accepted and appreciated within the university. However, the resource environment for the further development of entrepreneurship in general, and activities in entrepreneurship teaching in particular, seems challenging (see the next sub-section on managing the acquisition of resources below). One of the aims of the IUG with regard to a further integration of EE in the university institution would be to move the university's leadership from considering entrepreneurship as a core theme of the IUG towards pursuing entrepreneurship as a development goal of the JKU organisation as a whole.¹⁷⁰ However, beyond top-down leadership to advance entrepreneurship, activities and opportunities for spreading entrepreneurship also originate bottom-up from individual EE activities. One example of this is the co-operation between the business and the engineering and science faculties of the university within the patent-based business planning course where university patent scouts work jointly with IUG staff to develop business ideas and potential venture projects from the university's patent base (see 10.2.3 for details). In 2014, the university established a third-party funded project in technology and knowledge transfer. The co-operation on patent commercialisation within the above entrepreneurship course of the IUG is one of the core elements of this project (the "Wissenstransferzentrum West"; see <http://www.jku.at/iug/content/e49383>).

Managing the acquisition of resources

JKU funds entrepreneurship education through the budget of the IUG as a regular institute of the university. In addition, the university in general, and the IUG in particular, put efforts into acquiring further third-party funding for entrepreneurial activities. These efforts are important for two reasons:

First, most of the mid-level teaching personnel in public higher education in German-speaking countries are in non-tenured temporary employment, which results in a high level of labour turnover. Projects funded by third parties offer scope for employing EE personnel which the university is only allowed to employ on fixed-term contracts for a limited time horizon.¹⁷¹

Second, the volume of the regular budget of the IUG is fairly limited (four full-time equivalent research and teaching staff and a small four-digit budget for material expenses). This basic resource endowment is fairly inflexible while enrolment to entrepreneurship (and other) courses is handled fairly open at JKU, thus leading to noticeable bottlenecks in entrepreneurship teaching and, reportedly, to challenges in maintaining the didactical quality in overcrowded entrepreneurship courses. The IUG, however, tries to address such bottlenecks by offering additional courses via external lecturing or stretching the teaching load of IUG staff who have a strong intrinsic motivation to engage in entrepreneurship teaching.¹⁷²

¹⁶⁹ Moreover, the IUG and the university currently aim at establishing an Entrepreneurship Charta for higher education institutions in Upper-Austria so as to anchor entrepreneurship more strongly in the education system of the region (WKOÖ/Academia Superior, 2013).

¹⁷⁰ In fact, entrepreneurial behaviour and knowledge ("unternehmerisches Verhalten und Wissen") has been taken on board as one of the development goals of the university. However, with a plurality of different goals and organisational demands from the university's departments and research disciplines it is considered challenging in IUG's view to substantially improve the resource base for entrepreneurship education from regular funding from the university's annual budget.

¹⁷¹ This is widespread practice in the public higher education sector in German-speaking countries like Austria. Labour regulation allows employment at higher education institutions for a maximum of four years in Austria (six years in Germany; with additional periods of employment)

¹⁷² The IUG's efforts to alleviate capacity bottlenecks for entrepreneurship students have been validated by representatives from the local branch of the Austrian National Union of Students (Österreichische HochschülerInnenschaft).

10.4.2. Mindsets and attitudes

Raising awareness for the importance of entrepreneurship

In addition to IUG's visible campus-wide extra-curricular activities the institute has made efforts to promote its EE offers, to showcase the entrepreneurial careers originating from JKU (student/graduate and alumni entrepreneurs), and to highlight the potential opportunities in acting entrepreneurially. For example, entrepreneurship events, the offers of the Start-Up Centre, portraits of JKU entrepreneurs as role models, and the work and support services of JKU's network of "Gründungshelfende" have been published in campus and alumni magazines, often featuring a whole issue dedicated to start-ups and entrepreneurship (e.g. Kepler Society Karriere News, Mai 2012 – Gründer Extra; Kepler Society 13 März – Karriere News Gründer Extra, 2013; JKU Univationen 2/13; JKU Campus News 02/2014; OÖ Nachrichten Campus, März 2014).

Overall, in the academic year 2013/14 around 150 students were enrolled in the entrepreneurship specialisation. In terms of employability the IUG's clear objective is to contribute to developing entrepreneurial mindsets in these students with self-employment as a tangible career option ("Karriereoption Selbständigkeit"). An alumni survey conducted by the IUG amongst JKU alumni (Kailer et al., 2012) has shown that 30% of them were involved in entrepreneurial activities (as entrepreneurs or intrapreneurs, succeeding in or running a family business; also see 10.6.1) or were planning the start-up.

Encouraging entrepreneurial behaviour

The interviewees in the case¹⁷³ reported a range of catalysts and obstacles from different areas towards true entrepreneurial behaviour of university members, in particular among current and former students. The main *obstacles* (from the perspective of JKU students) to start a business are reported to be lacking financial resources, the perceived financial risks in starting one's own business, and the absence of marketable business ideas.¹⁷⁴ These (and other) potential start-up barriers may be addressed to some extent by EE with designs of curricular and extra-curricular EE activities which generate actionable business ideas (e.g. on the basis of university patents, but also more broadly) and which give students real access to (regional) players that provide consulting and finance. The *catalysts* entail elements both outside and inside the university organisation.¹⁷⁵

- *Regional context*: Upper-Austria features a strong industrial base with family firms and a backbone of SMEs with both ample opportunities for starting new businesses and needs for business succession¹⁷⁶.
- *Functioning regional support network of "Gründungshelfende" for academic start-ups* (as mentioned by the interviewees in different facets): the support network has been established and promoted at JKU and within the region for more than a decade; entrepreneurship students get in touch with actors and institutions in new venture support within the network during their studies.
- *Network and communication platforms within JKU*: extra-curricular activities like the founders café and the founders fair facilitate networking amongst nascent and experienced entrepreneurs, members of all regional universities interested in starting-up, and the network of "Gründungshelfende".
- *Chain of support for individual potential entrepreneurs*: within the above network students as potential entrepreneurs get support alongside the path from studying entrepreneurship on

¹⁷³ In all interviews, respondents have been asked for their opinion regarding possible drivers of entrepreneurial activity at their university (the drivers mentioned in the text have been replicated across individual interviews).

¹⁷⁴ As reported in the sub-sample of students at JKU within the Austrian National GUESSS Survey – Kailer (2012); Kailer et al. (2012); data on the current Austrian GUESSS Survey co-ordinated by the IUG is available online at <http://www.jku.at/iug/content/e55642> (including a brief report on data for the JKU sub-sample).

¹⁷⁵ For a further discussion of the entrepreneurial potential, activities, and context factors at JKU and in Austria see Kailer and Wimmer-Wurm (2012), Kailer et al. (2012), Wimmer-Wurm et al. (2013), and Kailer et al. (2014).

¹⁷⁶ See <http://www.jku.at/iug/content/e49536> for an overview of alumni start-up founders and entrepreneurs amongst the group of former IUG entrepreneurship students.

campus towards starting a business supported by the Start-Up Centre and the regional start-up network (see 10.2.6).

- *Hands-on, practical focus of EE:* the offer of business planning and problem-centred entrepreneurial management courses – though not sufficient in itself –contribute to encouraging entrepreneurial behaviour (see 10.2.3; in particular the patent-based business planning and innovation lab courses); an important design element of the course offers seems to be the opportunity for students to work in teams on real start-up challenges and business ideas, often together with academic entrepreneurs and the people from the above mentioned support network serving as external lecturers.

10.5. Outreach to external stakeholders of entrepreneurship education

10.5.1. Types of relationships with external stakeholders

The IUG has a range of relationships with external stakeholders. Two related types of co-operation stand out in particular with regard to EE: a) the major group of external lecturers coming from outside the university and, b) the coaching and support services provided for start-ups from the university by regional institutions. These two paths of stakeholder involvement in EE overlap. However, this is a positive characteristic as external lecturers originating from these regional institutions do build bridges between entrepreneurship students and their professional work as consultants at start-up/ business plan consulting days or fairs. Many EE instructors in the pool of external lecturers have graduated in entrepreneurship from JKU or even worked with the IUG before moving to the professional start-up service, technology, or finance sector or founding their own business. Generally, this structure of personal, long-lasting relationships between the IUG staff and professionals from external stakeholder institutions has evolved into a support network for academic entrepreneurship around JKU. Within the network, it seems to work well to keep the wheels in motion on a frequent basis and to generate incentives for network members to support JKU entrepreneurs continuously (e.g. as their ventures become incubator firms and register as members of industry chambers etc.).

10.5.2. External stakeholders involved in entrepreneurship education

Enterprises

The most important form of involving enterprises in EE at the university is surely the continuous integration of start-up entrepreneurs in the IUG's business planning courses where entrepreneurs co-operate with student teams; frequently start-up internships and further collaboration projects evolve from initial class-room learning (see 10.2.3).

Support services

Both professional consultants and public start-up service employees are represented on the board of external lecturers associated with the entrepreneurship teaching portfolio at the IUG (e.g. professionals from WKO's start-up service). And, as noted in 10.5.1, the same people also offer advice and support to students interested in founding their own venture or pursue a career as "Gründungshelfende" in a similar way (see 10.2.3 and 10.2.6 for details).

Incubators, accelerators, science parks and technology parks

In much the same way, the university co-operates with all institutions which provide a home for start-ups and ventures from science. As a shareholder, the university is closely related to the pre-incubator "akostart oö Akademisches Startup Netzwerk Oberösterreich", which is dedicated in particular to domiciling venture projects from higher education institutions in Linz (e.g. offering co-working spaces close to the campuses; www.akostart.at) and to the technology incubator tech2b (www.tech2b.at).

10.6. Impact and lessons learned

10.6.1. Evaluating impacts of the entrepreneurship education approach

Overview of impact evaluation methods applied

The IUG puts a focus on instruments for further evaluating EE provided beyond traditional methods like exams or ex-post course evaluation by students. Three of these instruments are presented below: participation of student teams in national business plan competitions, local GUESSS sub-surveys, and alumni surveys.

Student teams in business plan competitions

This instrument is integrated directly in EE courses and is used in the business planning courses within the entrepreneurship specialisation for business students. Business plans written by student teams are submitted to national business plan competitions (such as the i2b competition). This provides not only a useful incentive instrument for students (JKU teams have been very successful in these competitions) but also a valuable tool for external feedback from the juries of these competitions.

Local GUESSS survey

The IUG leads the Austrian national initiative within the global university entrepreneurial spirit students' survey (GUESSS). In fact, IUG has been part of the GUESSS initiative (formerly ISCE) since its start back in 2006. The institute also publishes local surveys from the sub-sample of JKU students (f.i. Kailer and Wimmer-Wurm, 2012), including their extent of entrepreneurial intent, perceived barriers and chances in self-employment and business succession (within the context of other occupational choices), career ambitions, and evaluations of JKU's education and support offers in entrepreneurship. These surveys are valuable also in terms of Austrian national and international comparisons as well as – though not a true panel study – inter-temporal insights from previous GUESSS rounds (see Kailer et al., 2012, 2013, 2014 and, for the history of IUG GUESSS Surveys, <http://www.jku.at/iug/content/e55642>).

Entrepreneurship alumni survey

The institute has also conducted its own online alumni survey of JKU graduates with a sample of around 2.700 questionnaires (Kailer et al., 2012). Alumni surveys offer a good opportunity to explore the common time lack between participating in EE and actual entrepreneurial behaviour of students and graduates. Such ex-post evaluation of EE activities by alumni (who have already started their professional careers) also offers a useful addition to traditional ad-hoc evaluation of EE in class by the current generation of students. Though operating with limited resources, staff of the institute (assisted by thesis students) are currently in the process of setting up a more detailed database of alumni who studied in the entrepreneurship specialisation and, in particular, alumni entrepreneurs. With this database future entrepreneurial career paths may be tracked, for example, in the form of qualitative case studies and teaching cases.

10.6.2. Lessons learned

Summary of lessons learned from this case

Four distinct features stand out within the differentiated concept of entrepreneurship education operated by Johannes Kepler University Linz through its Institute for Entrepreneurship and Organisational Development ("IUG"): 1) the concentrated approach of the IUG on hands-on entrepreneurial management centred on real entrepreneurial challenges for students (**stimulating entrepreneurial challenges in a focused curriculum**); 2) the pronounced integration of entrepreneurs and professionals in start-up support ("Gründungshelfende") as external lecturers (**entrepreneurs and "Gründungshelfende" in entrepreneurship teaching**); 3) the grown regional network for coaching individual academic entrepreneurs conjunct with class-room teaching (**chain of support for potential student and graduate entrepreneurs**) and; 4) the evaluation of entrepreneurship at JKU in the context of repeated student/ graduate surveys (**evaluation of EE and entrepreneurial careers**).

These features contribute to support and motivate students, graduates, and alumni to consider entrepreneurship as a career option, for example in self-employment, business succession, and work in start-up support organisations like incubators, technology parks, financing institutions,

or in public start-up service. The approach is well aligned with the context in which the IUG operates as the core organisational unit delivering EE within the university. Both the above features and their conformance to the work and resource environment offer interesting lessons to be learned; the most instructive part of the case in terms of particular EE activities is the design of the “Patent-based Business Planning” and “Innovation Lab” courses:

(1) *Stimulating entrepreneurial challenges in a focused curriculum*: The course formats in entrepreneurial management (in particular business planning) based on real challenges for student teams to work on, constitute an engine for students to build competencies to develop their own business ideas, screen opportunities, and solve management problems in the course of exploiting these opportunities in a new business. This is in particular in the *Patent-based Business Planning* and *Innovation Lab* courses discussed in 10.2.3 where patent scouts from the university and real entrepreneurs provide authentic input in the teaching process and students work on building business ideas based on university patents held by the university and tackle entrepreneurial challenges in academic start-ups. A key driver of fine tuning the design of these courses to enhance students’ learning has been the process of continuous improvement initiated by internal IUG staff teaching these courses. Institutionally, sustainability of such elaborate EE offers is challenged by the typical fluctuation of mid-level teaching staff employed only temporarily at Austrian universities. IUG has found a viable path to at least partly ensure continuity and sustainability in its teaching portfolio through a long-term pool of external lecturers who often have worked with or studied at the institute before.

(2) *Entrepreneurs and “Gründungshelfende” in entrepreneurship teaching*: In addition to being an element of sustainability in entrepreneurship teaching, external lecturers also contribute to the practice-oriented teaching of entrepreneurship at JKU. This is not only in the typical function of entrepreneurs as role models, but also the approach to include professional “Gründungshelfende” from regional institutions of start-up support in curricular teaching in a systematic and continuous way (rather than one-off guest lectures or detached individual extra-curricular events). This approach also appears to be useful with regard to running IUG’s teaching portfolio resource-efficiently in light of the limited internal resource base of the institute. In terms of teaching objectives, the close contact of students to such entrepreneurship professionals in class is a core element of the bridge to the established network for venture support at JKU within the region of Upper-Austria.

(3) *Chain of support for potential student and graduate entrepreneurs*: In essence, students at JKU can rely on a chain of support should they be interested in pursuing their own business idea and starting their own business. Three aspects stand out in terms of the effectiveness of the approach: First, support emanates directly from class-room teaching by external lecturers and by IUG staff who also run JKU’s Start-Up Centre i.e., those persons who can address perceived start-up barriers by offering advice and material support for individual entrepreneurial careers are well known to students. Second, the network around the IUG is based on close personal contacts between people from the different institutions involved (the WKO, the akostart pre-incubator and tech2b high-tech incubator, other Upper-Austrian HEIs, and many others). This enables a fairly informal co-operation in processes of coaching individual academics and supporting start-up projects across institutions in the network. Third, the extra-curricular activities like the Founders Café and start-up fair events organised regularly by the Start-Up Centre help to maintain the network over time and provide a communication platform for potential entrepreneurs from university.

(4) *Evaluation of EE and entrepreneurial careers*: IUG’s efforts to conduct regular evaluation surveys among former and current students, in particular as the country co-ordinator for Austria in the international GUESSS initiative (Global University Entrepreneurial Spirit Students’ Survey), are important to argue the case within the university for the importance of entrepreneurship, for example its significant contribution to graduate employability as well as to the infrastructure for economic development and business activity in Upper-Austria.

Transferability to other universities

Overall, the magnet approach around the IUG as the single lead organisation delivering entrepreneurship education at Johannes Kepler University seems transferable. This is in view of the effective use of what is a comparatively lean internal resource base. In particular, higher education institutions planning to establish and expand their infrastructure in entrepreneurship teaching may find the case of the IUG to present a valuable blueprint. A focused combination of a portfolio of courses dedicated to hands-on entrepreneurial management and a strong network

of external lecturers may allow setting up a curriculum in a flexible and resource-effective way and, at the same time, getting real-world practice into class. It will, however, require systematic and continuous efforts of committed university entrepreneurship staff like the IUG team in order to maintain such a teaching portfolio and a conjunct network of people providing regional start-up support around a university's potential entrepreneurs.

Others may also find IUG's teaching and course material useful and in fact the innovative patent-based business planning course is planned to be scaled to a transferable module format in the context of a knowledge transfer project funded by the Austrian government. Generally, mixed research and transfer projects fuelled by third-party funding may allow enlarging the resource base for entrepreneurship teaching. However, this may only be a feasible path for specific teaching and content formats attractive to third-party funding institutions, for example, related to technology entrepreneurship and patent commercialisation (in the area of innovation and technology policy) or sustainable and green entrepreneurship (in the area of public sustainability and environmental policy).

Finally, IUG's approach to evaluate entrepreneurship and graduate careers at Linz by contributing to larger national or even international surveys like the GUESSS (or other studies where entrepreneurship scholars are open to expand their data collection) may be interesting to follow. Such co-ordinated impact evaluation may generate insights to (further) improve entrepreneurship teaching and to raise the appreciation of entrepreneurship in higher education.

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Research for this case study was conducted by Marc Grünhagen (Researcher /Lecturer in Entrepreneurship, Schumpeter School of Business and Economics, University of Wuppertal, Germany), on behalf of the study for supporting the entrepreneurial potential of higher education (sepHE). Sources and references used include desk research plus:

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11. University of Ljubljana, Slovenia: Applying the Design-Thinking approach to entrepreneurship education

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Abstract



The Faculty of Economics of the University of Ljubljana (FELU) offers courses on undergraduate, graduate and MBA level in entrepreneurship education (EE), including specialisations in entrepreneurship. In 2006, FELU introduced the Design Thinking (DT) approach to EE. DT is a human-centred, action-oriented and iterative problem-solving and idea-generating method. In courses applying DT, student teams generate business ideas, develop entrepreneurial projects and test prototypes through engaging with customers. The DT approach was meant to overcome downsides of a more traditional way of EE, focusing on writing business plans, which FELU applied before. The business plan approach did not trigger much creativity and did not lead to many new ventures. The Ljubljana case shows that the application of DT can generate valuable business ideas and change mindsets towards a consciousness of "being capable". DT courses comprising entrepreneurial projects, start-up weekends and "three euro challenges" were found to be stimulating, action-orientated EE formats. Furthermore, FELU teachers successfully introduced DT in schools for pupils at the age of 12 to 15 and for unemployed people as well. High student motivation as well as suitable staff and sufficient resources for prototyping are important preconditions for achieving good results in applying DT. However, the case study also revealed legal barriers to student entrepreneurship: students lose their privileges when they start their own business, and selling a product without having a company is prohibited.

Case study fact sheet¹⁷⁷

▪ Full name of the university and location:	University of Ljubljana, Faculty of Economics Ljubljana University (FELU), Ljubljana, Slovenia
▪ Legal status	Public
▪ Location:	Ljubljana, Slovenia (FELU branches: Skopje, Macedonia; Prishtina, Kosovo)
▪ Year of foundation:	1919 (FELU: 1946)
▪ Number of students:	48,822 (FELU: 5,500)
▪ Number of employees	5,972 FELU: 165 faculty (including teaching assistants) 97 (administration staff) 25 long term part-time contracts with foreign faculty
▪ Budget in most recent financial year:	308,347,488 EUR (FELU: not available)
▪ Academic profile:	23 faculties and three art academies
▪ Entrepreneurial profile:	Courses on undergraduate, graduate and MBA level, specialisations in entrepreneurship: BSc, BA and Master.
▪ Activities focused in this case study:	The Design Thinking approach – implementation and experiences at the University of Ljubljana
▪ Case contact person(s):	Prof. Tea Petrin, (former EE programme director), FELU, Prof. Mateja Drnovšek, (head of academic department of EE), FELU

¹⁷⁷ Source for University of Ljubljana data: http://www.uni-lj.si/university/university_in_numbers, Source for FELU data: Prof. Drnovšek.

Information included in this case study is from end of year 2014 unless stated differently.

11.1. The university's entrepreneurship education profile

11.1.1. The university's overall approach to EE

Key characteristics of EE at the University of Ljubljana

At the University of Ljubljana, entrepreneurship education (EE) is taught at the Faculty of Economics (FELU). One basic EE course is also conducted at other faculties. The objective is empowering students to create new businesses, to manage early-stage ventures and to respond entrepreneurially in any other relevant context. EE courses are composed of theoretical EE and the hands-on application of the Design Thinking (DT) approach.

The goal and the contents of EE at FELU evolved over time. It started in 1989, i.e. before the change of the economic system in former Yugoslavia, with one graduate course. Macroeconomic considerations from Prof. Aleš Vahčič, former Deputy Minister of Economy before the civil war, and Prof. Tea Petrin, former Minister of Economy from 1999 to 2004 in Slovenia, built the basis for the introduction of EE. They saw a need for competition and entrepreneurship, including the development of start-ups and SMEs, in order to avoid the collapse of the economic system. Before and after the war, the aim of EE at FELU was first to increase awareness, to develop an entrepreneurial culture among the students and to change their mindsets so that they would recognise the possibility of self-employment or of working in a start-up company.

In 2006, Prof. Vahčič introduced the Design Thinking¹⁷⁸ methodology at FELU, following a visit at the d.school, the Hasso Plattner Institute of Design, in Stanford, US¹⁷⁹, where the methodology was originally developed. The ambition behind DT is to achieve a human-centred, problem-solving and idea-generating method, which is oriented towards the working process of designers. The DT approach, developed by the d.school in Stanford, consists of five steps, used in an iterative way: empathise (i.e. understand the users), define (the problem), ideate (i.e. develop ideas and solutions), prototype, and test.¹⁸⁰ Various authors adapted the order and the steps from three to seven stages.¹⁸¹

Exhibit 1-1 illustrates on the left hand side, the basic logic of the process, which seems to be circular or linear at first sight. However, the actual (cognitive) process is rather an iterative way to reach a solution in different learning cycles, switching between the stages, as depicted in the picture on the right. The stages are combined according to the information needed, in particular situations throughout the project. New insights, especially during prototyping and testing, may lead to adjustments in the prior stages, such as redefining the problem, reconsidering customer needs, the need to find new solutions, the adaptation of the prototype, and additional tests.¹⁸² Applying DT, the role of the teacher is supposed to change from being an ex-cathedra lecturer to acting as a coach in supporting the student teams in their development process.

¹⁷⁸ See Plattner et al. (2009); Waloszek (2012); Ingle, B. (2013); d.school (2013).

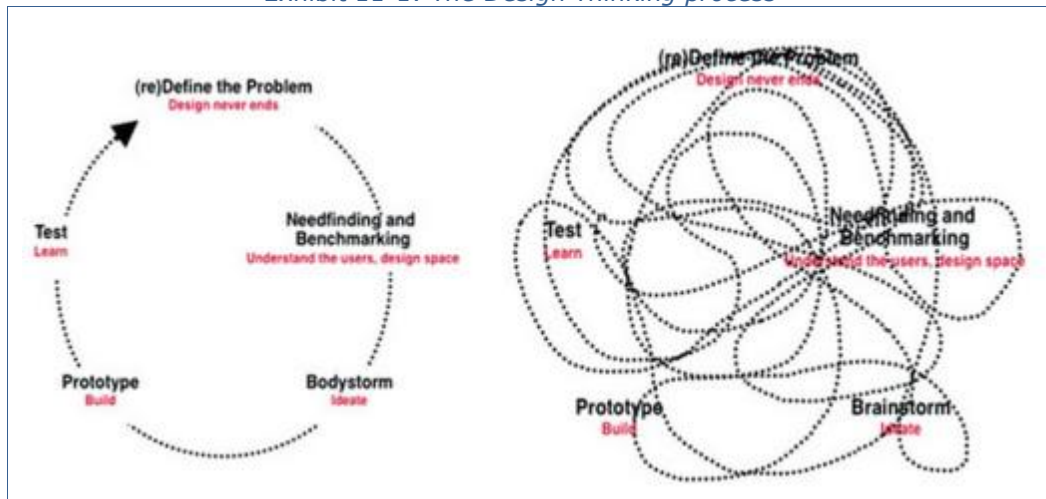
¹⁷⁹ See <http://dschool.stanford.edu/>.

¹⁸⁰ In Exhibit 1-1, steps one and two are swapped. Nevertheless, the underlying idea persists.

¹⁸¹ E.g. Plattner et al. (2009): (1) understand, (2) observe, (3) define point of view, (4) ideate, (5) prototype, (6) test. An overview of different process models can be found in Waloszek (2012).

¹⁸² See Zupan et al. (2013), p. 3f.

Exhibit 11-1: The Design Thinking process



Source: Zupan et al. (2013) from Meinel/Leifer (2011), p. 14.

Hence, at FELU, key aspects of using the concept are an in-depth understanding of potential customers’ problems and needs, team-based generation of ideas, fast and low cost prototyping and testing, and an iterative way of connecting the different steps. The multi-disciplinarity of teams, a core part of the general DT approach, is not yet achieved in most of the courses since students from other faculties are not regularly involved.

Today, DT is applied at FELU in several EE courses at undergraduate and graduate levels as well as in the MBA programme. DT is also applied in extra-curricular activities comprising start-up weekends, EE in schools for pupils at the age of 12 to 15 and EE for unemployed people. These can be considered as new models in EE.

Publicity of the case

While the original approach from Stanford can be seen as a general problem-solving and idea-generating approach for multiple disciplines, the University of Ljubljana was one of the first universities to connect the Design Thinking approach to EE. This connection has also found attention in literature.¹⁸³ However, the FELU case is not yet widely known across Europe.

11.1.2. Leadership and governance

Extent of high level commitment to implementing entrepreneurship

The Rector of the University of Ljubljana (Prof. Dr. Ivan Svetlik) has a positive attitude with regard to entrepreneurship, according to one interviewee. In his previous position as a Minister of Employment, he passed a law in order to foster entrepreneurship and self-employment of previously unemployed people. The Vice Rector (Prof. Maja Makovec Brenčič) of the University is highly supportive of the DT approach and promotes it across the University. In addition, the FELU’s past Dean and the current Dean were said to be supportive of the DT approach. DT is also well promoted within FELU. Every year one strategic conference and one pedagogical conference are held by the faculty. In recent years, the DT approach was promoted in these conferences.¹⁸⁴

Importance of entrepreneurship in the university’s strategy

EE and DT do not have a top priority in the University of Ljubljana’s strategy. The orientation towards research and academic excellence dominates the overall strategy. However, **entrepreneurship is mentioned explicitly** in the strategy’s section “3.3. Use of knowledge -

¹⁸³ See e.g. Ingle (2013), Zupan et al. (2013).

¹⁸⁴ In June 2014, the academic unit of entrepreneurship was asked to use DT to manage one of the conference’s parallel sessions. In 2013, the DT approach was presented to all faculty members.

third dimension of the university” of the University’s strategy: “The University of Ljubljana exercises social responsibility by transferring the created knowledge into practice. This is achieved by the developmental, research, and professional activities, by employment of graduates in other organizations, by encouraging entrepreneurship, by counselling services and by including professional experts in educational activities, by lifelong learning programmes.”¹⁸⁵

Level of autonomy to introduce EE courses

FELU established the DT approach bottom-up. This was possible because of the faculty’s actual autonomy in designing their courses. At FELU, there is a two tier approach with regard to the teachers’ autonomy: teachers and the team of the academic unit can make independent decisions about small changes in teaching pedagogy and methods used, materials and the like. Big changes such as names of the course and the names of the lecturers responsible for the course need to be accredited through the Slovenian Quality Assurance Agency for Higher Education (SQAA, in Slovenian NAKVIS¹⁸⁶). The teachers have to announce course changes to the SQAA annually. However, it was stated in the interviews for this case study that normally no one would refuse proposed changes if they are in line with the learning objectives of the course.

11.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

The academic department of entrepreneurship was formerly led by Prof. Vahčič and Prof. Petrin, both of whom retired in July 2014 but are still active. Today the unit is led by Prof. Mateja Drnovšek who co-ordinates EE course outlines and contents in her team. Formally, the academic department of entrepreneurship comprises nine professors, associate and assistant professors as well as teaching assistants. Two entrepreneurs, Dr. Rok Stritar and Blaž Zupan, are employed and teach at FELU, mostly with the DT method, while pursuing their academic career. One assistant professor, Prof. Dr. Anja Nabergoj, regularly teaches at Stanford University, Hasso Plattner Institute (“d.school”).

Financial resources for entrepreneurship education

When introducing the DT approach, the material and some equipment in the prototyping room was financed by Prof. Vahčič and Prof. Petrin from their own private money. Later, when other instructors beside Prof. Vahčič used the room, the university paid for the extension and the additional equipment of the prototyping facility. In fact, the academic Department of Entrepreneurship has not been allocated any budget. Its decision power is therefore limited. The University and FELU receive funding per student, which is then allocated by FELU. Additionally, FELU funds novel teaching approaches such as DT, which is beyond the lump-sum money per student. This is based on money FELU earns with commercial research, consulting and part-time education programmes.¹⁸⁷

11.2. Entrepreneurship in curricula and teaching

11.2.1. Overview about curricular offers

The entrepreneurship education curriculum at FELU comprises theoretical EE courses and the “hands-on” application of DT in various courses on undergraduate, graduate and MBA level. FELU offers a specialisation in entrepreneurship on undergraduate level (BSc and BA) and on graduate level (Master in Entrepreneurship), both in Slovenian language.¹⁸⁸ The EE course “Business Design” is part of FELU’s MBA Programme. Exhibit 1-2 shows a list of FELU’s EE courses which are offered after Bologna reform was introduced in 2006. The graduate programme on entrepreneurship was introduced already in 1992. Some of the courses in the

¹⁸⁵ See <http://www.uni-lj.si/university/strategy/> for the University’s mission, http://www.uni-lj.si/university/mission_values_and_vision/ for its mission statement, and for FELU http://www.ef.uni-lj.si/mission_&_vision.

¹⁸⁶ See <http://test.nakvis.si/en-GB/Content/Details/8>.

¹⁸⁷ Several other schools within the University are not that proactive and solely depend on the money allocated by the university (government).

¹⁸⁸ A Master programme in English is offered in Prishtina, Kosovo, which is not analysed in this case.

Bologna graduate entrepreneurship programme are a continuation of the first programme introduced in 1992. Some of the courses are electives.

Furthermore, there are EE bridges to school education in Slovenia as well as EE offers to unemployed people.

Exhibit 11-2: Overview about curricular EE offers at the University of Ljubljana

No.	Course name	Objectives / contents	Target group	Offered since [year]	No. of participants in 2013/14
Undergraduate					
1	Entrepreneurship (FELU)	Basics of business plan, partially DT method (recently)	Undergraduate FELU students (Bachelor degree)	1996	370
2	Entrepreneurship (Erasmus)	Basics of business plan, DT method / project work ¹⁸⁹ : Development of viable, desirable and technologically feasible prototypes Market testing of the prototypes	Undergraduate Erasmus students at FELU (Bachelor degree)	2010	140
3	Entrepreneurship (other faculties)	Basics of business plan, DT method / project work: Development of viable, desirable and technologically feasible prototypes Market testing of the prototypes (This course combines contents of the course "Entrepreneurship" (1) and "Entrepreneurial Project 1" (4). There is more focus on project work and DT than in the Erasmus course.)	Separate courses for undergraduate students (bachelor degree) at the Faculty of Chemistry, the Faculty of Civic and Geodetic Engineering, the Faculty of Computer and Information Science, the Faculty of Natural Sciences	2010	approx. 60-100 at each faculty
4	Entrepreneurial Project 1	DT method / project work: Development of viable, desirable and technologically feasible prototypes Market testing of the prototypes	Undergraduate FELU students, (Bachelor degree)	2006	65
5	Effective Presentations	Training students' communication skills, partially DT method (recently)	Undergraduate FELU students, (Bachelor degree)	2006	30
6	Family Business	Specificities of family-run businesses	Undergraduate FELU students, (Bachelor degree)	2006	20
7	Development of Entrepreneurial Opportunities	DT method / project work: Empathy, opportunity identification, opportunity development	Undergraduate FELU students, (Bachelor degree)	2006	37

¹⁸⁹ The Erasmus course "Entrepreneurship" (2), constitutes a mix of contents of the course "Entrepreneurship" (1) and "Entrepreneurial Project 1" (4).

8	Risky ventures	Theoretical / seminars: Financial planning for growing entrepreneurial ventures	Undergraduate FELU students, (Bachelor degree)	2006	65
9	Entrepreneurs' Profile	Theoretical/case studies Specificities of different profiles of entrepreneurs (starting from different theoretical approaches) and their role in the economy and society as well as identifying factors of their success	Undergraduate FELU students (Bachelor degree)	2010**	12
Graduate					
10	Theory of Entrepreneurship	Theoretical / seminars: Introduction to different important topics in entrepreneurship theory Practical application of theoretical concepts	Graduate FELU students, (Master degree)	2006*	50
12	Technological Entrepreneurship	DT method (partially): Developing technological opportunities Technology management New product development	Graduate FELU students, (Master degree)	2006	35
13	Counselling for SMEs	Counselling to SMEs, theoretical aspects and practical applications	Graduate FELU students, (Master degree)	2006*	35
14	Entrepreneurial Project 2	DT method / project: New product development through DT method, action oriented	Graduate FELU students, (Master degree)	2006	40
15	Financing growing ventures	Addressing specific issues related to financing start-ups and growing ventures	Graduate FELU students, (Master degree)	2006*	43
16	Cluster dynamics	The role of cluster in start-up promotion	Graduate FELU students, (Master degree)	2006	Currently not offered
17	Entrepreneurship policy and infrastructure	Theoretical justification for entrepreneurship policy, entrepreneurship policy in practice, institutional support to entrepreneurship	Graduate FELU students, (Master degree)	2006*	16
18	International Entrepreneurship	Theoretical / seminars: SME internationalisation	Graduate FELU students, (Master degree)	2008	35
19	Business Ethics	Learning of business ethics through cases of specific situations	Graduate FELU students, (Master degree)	2006*, **	50
20	Innovation management	Addressing specific issues related to IP in young ventures	Graduate FELU students, (Master degree)	2006*, **	40
21	Change management	Understanding and learning about processes of corporate renewal	Graduate FELU students, (Master degree)	2006**	40

22	Business Design	DT method: Understanding and developing solutions for established ventures through DT	MBA / Executive students at FELU	2012	15
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Notes:

* This course has its roots in the first version of the entrepreneurship programme at graduate level which was introduced at FELU in 1992 (PHARE programme in cooperation with Sterling University, Institute of Social Science, The Hague and Universidad Politecnica de Madrid).

** Elective course

11.2.2. Target groups

Main target groups of entrepreneurship education at FELU

FELU offers EE mainly to students from the same faculty. An exception is the undergraduate course “Entrepreneurship”, which is taught to about 60 to 100 students each semester at the Faculties of Chemistry, Civic and Geodetic Engineering, Computer and Information Science, and Natural Science. The other EE courses are offered to FELU students at undergraduate, graduate or MBA level.

FELU recently developed five profiles of students as target groups for EE, according to the students’ career targets. The development of these profiles was motivated by a faculty-wide initiative of the FELU Board to revise the graduate entrepreneurship courses. The profiles include:

- Start-up entrepreneurs;
- Successors of a family business;
- People interested in social ventures or companies or other social organisations;
- Employees developing business models and opportunities for growth-oriented new companies and growth in existing companies;
- Start-up consultants.

Before, there were only three target groups specified for the graduate Master of Science in Entrepreneurship programme: start-up entrepreneurs, entrepreneurship policy makers, and successors in family businesses.

Bridges to school education

In 2013, FELU started an EE programme pilot in Slovenian primary schools.¹⁹⁰ The course called “With Creativity and Innovativeness to an Enterprising Mindset” includes DT and is tested in ten primary schools for pupils at the age of 12 to 15 (in the 7th, 8th and 9th grade). The course is offered as an extra-curricular school activity. In the school year 2015/16 it will be offered as an elective course. The objective of the course is to develop an entrepreneurial mindset of pupils in primary schools. It is considered to be too early to include the target of building a new business at that age. The course’s focus is on problem-solving and becoming active with the DT method “through real problems, through real projects that they need to implement in the real world. It is not something that they learn from their books” (Blaž Zupan).

The primary school EE programme was initiated at a forum of stakeholders from politics, ministries and various agencies where FELU presented the design thinking approach. The Director of the Research Centre from the governmental agency for education saw the need to apply the DT approach in primary schools as a basic problem solving method. The administrative part of the project is managed by one person in the governmental agency, while Blaž Zupan from FELU is responsible for the content, the methodology of the course including

¹⁹⁰ Primary schooling in Slovenia is divided into two periods and ends at the age of about 14/15 with the second period. See: http://en.wikipedia.org/wiki/Education_in_Slovenia.

DT and the teachers' education. The teachers' education in DT was conducted in a two-day workshop with two teachers from each primary school, 20 teachers in total.¹⁹¹

At the beginning of the course, the pupils, together with the teachers, started with observing and looking for real problems relevant and meaningful to them. One project, for example, evolved from the problem of unused school rooms – due to the decreasing number of primary schools' pupils in Slovenia. Using the DT approach, the pupils installed a sports room where people could use sports equipment for training during free time. The course participants equipped the room after finding some sponsors. They posted rules on how to use the room and they promoted the use of the room to other primary students. Another project was initiated in co-operation with the Slovenian tourist society. The society sought to upgrade an educational trail in the forests. The primary pupils redesigned the trail, created signs, did some test tours with the teachers as guides and handed over the developed solution to local guides when ending the course.

In the project pilot, feedback meetings with the teachers were conducted in the middle and at the end of the project. It was pointed out that it is necessary that the pupils choose problems on their own in order to ensure their motivation and active participation. In the test phase, some teachers had imposed the topics, which led to poor motivation and poor results, since the problem was not meaningful to the pupils. In contrast, in another project, the teacher gave the pupils two weeks to observe problems in their surroundings, i.e. at school and with their family at home. After writing the collected problems on the wall, they chose to work on new lockers for the school, which was a very successful project implemented by highly motivated pupils: "They really dig into everything because they find it meaningful. They go outside and bring people in. They work after hours, they work during weekends." The rule that the teachers should leave the pupils to choose their problems will therefore be part of the adapted curricular rules in the rollout phase. As regards the role of the teachers using the DT approach, it was pointed out that the role change from a traditional teacher to a coach was sometimes difficult. In the traditional role, the teachers "know everything" and they decide the content and the homework they give. In the new role, they have to accept the topics the pupils chose and coach them in the DT process. In this case, the teachers sometimes know less about the problem and its focused solution than the pupils.

Additionally, after the pilot programme was over, a separate half-day workshop was held at each of the ten schools. All teachers were invited to attend and learn the method and think about the ways it could be implemented within or among their individual courses. More than 250 teachers attended these workshops, a number which indicates a high level of interest.

Since the pilot project was successful, the target of the project team, including the governmental agency, is to offer the course to all 400 primary schools in Slovenia in next year's curriculum.

Continuous education: DT course for unemployed people

Together with the Employment Service of Slovenia, FELU developed a DT course for 30 unemployed people. The course took three months, with a weekly class of three hours. Two FELU teachers and an experienced professional delivered the course. The combination of young FELU teachers and an experienced professional was said to be very fruitful. One FELU teacher also mentioned that interdisciplinary teams of three people would be an optimal size to teach DT.

According to the teachers, it was especially interesting to see how the unemployed participants changed their mindset and perception during the course. At the beginning, they were very pessimistic with regard to their situation: "There are 120,000 people unemployed, the unemployment rate is 12%, there is no way we can find a job." Applying DT, they were increasingly proactive in understanding potential employers, especially their economic situation, their concerns when employing people, and their needs. Over 60% of the participants of the course found a job or started their own business. The course teachers considered the offer a success.

¹⁹¹ Asking the question, whether the two days are appropriate to educate teachers, the interviewee responded: "If they get it, they get it in 2 days, if not I can work with them a month."

11.2.3. Designing lectures and courses – basic curricular decisions

Objectives

The general objective of EE at FELU is empowering students to start new businesses and helping them manage early ventures. Applying DT in EE intends to create valuable business ideas and also to develop a hands-on, action-oriented mind-set and relevant skills which students can use in practice.

Key aspects in using the DT concept at FELU in the different courses include the following:

- A deep understanding of potential customers' problems and needs, for example through interviews and customer visits;
- Joint, team based generation of ideas in brainstorming sessions;
- Visualisation of the ideas through sketching and fast, real prototyping;
- Real world testing, involving potential customers for feedback and learning;
- An iterative way of applying the different steps in loops, learning from failure and successes.

The reason for introducing the DT approach at FELU in 2006 was the downside of the traditional EE approach applied before. The former focused on developing and writing business plans. Many students simply "recycled" ideas and business plans from the years before. Moreover, the ideas were not seen as very creative and remained abstract, as the development of the business plan was mainly a writing exercise. A lecturer estimated that a large part of the students, approximately 70%, did not really understand that they were supposed to develop a business: "Students would forget about the big goal of developing a business, they would split the work into small tasks and then put everything together." In addition, the impact of EE was considered to be low, since few of the students actually started new businesses.

Until today, DT has increasingly permeated the courses, although some courses remain theoretical and are taught in a traditional, ex-cathedra way.

In the following, selected course examples illustrate how the DT approach was implemented at FELU, why it was implemented in a certain way and what experiences were made during the implementation in terms of successes and failures. A key challenge throughout the courses is the low motivation of a part of the students in conducting DT projects, especially at undergraduate level.

The following are the four main courses in which DT is applied and which are described in more detail: "Entrepreneurship", "Development of Entrepreneurial Opportunities", "Entrepreneurial Project 1" (all undergraduate level) and "Entrepreneurial Project 2" (graduate level). According to one interviewee, FELU "started with courses that are the most action oriented. Since then, the DT approach has spilled over to other courses as well". The course "Effective Presentations" illustrates that DT can also be applied to teach other subjects than entrepreneurship.

"Entrepreneurship" – Undergraduate

The course "Entrepreneurship" is mandatory for almost all undergraduate students of the economic faculty. Therefore, approximately 400 students participate each year in the Slovenian track and approximately 150 in the English (Erasmus) track. The Erasmus course "Entrepreneurship" constitutes a mix of contents of the course "Entrepreneurship" for FELU students and "Entrepreneurial Project 1" (described below), since the Erasmus students only have one course in EE. Introducing the DT approach in a course of such a large size, i.e. 400 students, in the FELU track was described to be a challenge.

Before the introduction of DT, the students were split into groups according to their surnames. A mentor was assigned to each group. At the beginning of the course, the students spent three to four weeks to determine their business idea. Thereafter, they developed a business plan with weekly homework and weekly presentations of what they did during the week. At the end, they presented a complete business plan. Since this approach did not trigger a satisfactory level of motivation and creativity, the teachers changed the course radically by introducing DT and adapting the course plan as well as the team composition. Instead of spending four weeks on developing an idea, the students now have to group and develop an idea in advance in order to attend the course: according to the interviewed lecturer, "that worked perfectly" in the last

course in 2013/2014. Two weeks before the course started, the lecturers had posted this requirement and the related process on the internet for those who did not have an idea that there was a market place available with an organised way to match up. The market place was not virtual but physical, with an announced time to meet in a room at FELU. Thus, students were not grouped according to their surnames but had to choose their own group ("as in the real world as entrepreneurs"): in the first official meeting of the course, the teams had to present an idea "that would be their first prototype." Hence, the students received the first feedback in the first session, which was described to be very helpful.

In addition, the teachers cancelled the weekly mandatory seminars. Instead, the students had the possibility to sign up for individual consultancies (via internet) which were not mandatory. After three weeks the students had to present their project and a first business plan to a jury of three people, including academics and entrepreneurs, in order to receive further feedback. The presentation included a developed solution including prototypes, tested market needs and a preliminary business plan including financial issues. The jury gave "real life feedback", such as not being "too nice". In order to avoid very subjective assessments, especially with regard to the "appeal of the idea", the jury is always composed of three people. After this presentation, the students had theoretical lectures, e.g. on more extensive financial planning using an Excel-based simulation tool. For the final presentation in front of the jury, they had to further develop their business plan and work on the aspects that the jury had pointed out. Again, the students could sign up for individual consultancies in between the two presentations.

According to the teacher of this course, the results of the course improved significantly: "We found out that for the last 20 years we did the seminars in vain". The teacher, who is an entrepreneur himself, mentioned that the share of ideas that could be turned into actual businesses was much higher with the new approach. Moreover, teachers gave better grades throughout the whole class. However, the results between groups with motivated students and groups with unmotivated students could be better distinguished due to very good performance of the motivated ones and poor performance of unmotivated ones.

"Development of Entrepreneurial Opportunities" – Undergraduate

The course "Development of Entrepreneurial Opportunities" is offered to students at the undergraduate level (Bachelor degree) with a specialisation in entrepreneurship. The course runs for six weeks with a "double load" of two official sessions a week. In addition, the students have to meet at least twice a week for group work on the projects. According to one lecturer, it is important that students meet several times a week and not just once in order to achieve good working results. After a two-hour introduction of DT in the first class, the students have to work on two DT projects, one lasting for two weeks and the second one for four weeks. The teachers introduce a broad topic, for example healthy food, for which the students have to interview customers, develop ideas and build prototypes. Recognising the difficulties that especially undergraduate students will face in interviewing real customers, the course starts with interviewing students at the university before any other external target groups can be interviewed.. The lecturers also bring potential customers into the classroom and help students to develop the conversation. One teacher stated that especially at the undergraduate level, the coaching of the student teams and developing students' trust in the teachers as coaches convince the students more about the DT method, rather than PowerPoint presentations of international firms that have already used the method successfully. Such presentations would be more important to graduate or MBA students, as they already work in companies and might have to argue internally to apply the method.

The course also contains the "Three Euro Challenge", which was asserted by one interviewed undergraduate student to be a very good learning experience. The challenge stems originally from an exercise by Tina Seelig at Stanford University. FELU adapted it for their purposes. Each student team receives three euros and has to develop and sell "something" to earn money. The team with the highest earnings wins the competition. The time period in which the money has to be gained varies from 48 hours to ten days. In one course in which an interviewed student participated, student teams sold home-made lemonade, muffins or wine, collected and sold scrap metal or organised a club event with entrance fees. Due to the legal problems of selling without a registered company, the teachers allowed the students to ask people also for charitable donations. According to the participating student, this influenced the selling experience as the charity aspect "gave a lot of extra points". In any case, the event was seen as

a very good learning experience since the students had to overcome contact barriers and to sell their value proposition to real customers.

"Entrepreneurial Project 1" – Undergraduate

The course "Entrepreneurial Project 1" is offered to students in their last year of undergraduate studies in the entrepreneurship specialisation. The objective of the course is to develop an individual entrepreneurial project. In the first years after introducing the DT approach in 2006, the focus was on group work with mentors from businesses and academia and a few lectures in between the project work. In 2013 and 2014, there was a change towards an individual approach, while also eliminating most lectures. The students should develop their own projects which might be turned into businesses later on. For students whose parents own a company, there was also the possibility to analyse problems and find solutions in and for the family business. However, the results of the course in 2013/2014 were not as good as expected. While one part of the students was said to be really motivated to achieve good results, a large part of students was not motivated for the individual projects despite having the possibility to choose their own projects. The importance of choosing the problems and ideas to work on by themselves was mentioned by some of the interviewed students as a contributing factor toward their motivation.

The results of the last course were considered to a large part as poor in terms of projects and prototypes, and the degree of satisfaction of both students and teachers was not high. According to the interviewees, one reason for the low motivation among students was the repeated application of the DT method in their undergraduate studies. Anticipating such problems, the teachers' original aim was to develop the course "one step further", with the target of setting up students' own business. However, most of the participants showed limited entrepreneurial intention according to the interviewees, including both students and teachers. This was attributed to the limited entrepreneurial culture in Slovenia in general, and the influence of the parents, the negative connotation of entrepreneurship and profit as well as legal and economic barriers (see sections 1.4.2 and 1.4.3 below in this case study). In addition, it was mentioned that some of the students have ideas but sometimes they think these ideas are not good enough, too "crazy", or they do not talk about it because they fear negative feedback and failure. Moreover, the individual consultation sessions during the projects were not sufficiently successful either. Each student had the possibility to receive individual consultations twice during the project. Sometimes "they felt under attack" when the teachers posed questions to them. Other students brought a non-disclosure agreement (NDA) to the teachers, being afraid that their idea could be stolen. In this course, the individual ideas and projects are not shown to others, only to the teachers, who in these cases signed the NDA. A large part of the students, however, "had the mission to get out as soon as possible". Both teachers and student as interviewees stated: "If someone does not want to develop his entrepreneurial project, you cannot help him. If students have their own projects, about which they are enthusiastic, then you can teach them very well."

The second part of the course in 2013/2014, a **mandatory start-up weekend**, was mentioned to be very successful. Start-up weekends were a result of DT work which a student had done on one of the FELU courses. In start-up weekends, an entrepreneurial project based on the DT approach is developed within a weekend. It starts on Friday evening, with a final presentation on Sunday. At the beginning, a brief market place is organised, in which the students divide into two teams for one and a half hour. Thereafter, they start to work "as quickly as possible", distributed over ten rooms of the university. The teachers take a consulting role by visiting the teams in a relaxed and hands-on atmosphere, "having fun" together with the students. The students develop their ideas, build prototypes and test them on the market in three days up to the final presentation in front of a jury. The jury consists of three panellists, not including the teachers from the weekend, but sometimes including investors. They grade the students on their business ideas, presentations and prototypes. Up to now, six start-up weekends were realised, with the last one being mandatory. According to a teacher, the mandatory start up weekend "turned out to be super great. It was so successful because people did not have anything else on their mind. They just come there and worked on their projects. They would throw away a weekend and say 'so we are here we can work on the project'". Compared to the voluntary start up weekends, the lecturer said that the mandatory weekend was even better at achieving good results in terms of ideas, prototypes and presentations.

"Entrepreneurial Project 2" – Graduate

In the course “Entrepreneurial Project 2”, at the graduate level, the students work in teams on developing new ideas and prototypes. In contrast to the course “Entrepreneurial Project 1”, which was for undergraduates and in which the individual ideas and projects are not shown publicly, in Project 2 everything that is developed is public property. When the course is finished, students and teachers can take the ideas and start a business (see the description of Optiprint and Printbox as a successful example in chapter 1.6). For building the prototypes, students have to take some of their own money to buy prototyping material. However, there is also a small course budget available for buying material. Partly, also in the first years of undergraduate studies, the students work on projects that have been initiated by company partners. The company partners stem mainly from Prof. Vahčić’s network, who still teaches graduate courses. Working with company partners has the advantage that the students receive practical experience in working together with the companies.

“Effective Presentations”

One of the teachers chose to apply DT in the course “Effective Presentations”. The students had to give at least five presentations during the course in a “trial and error” process. The student audience gave feedback for improving the presentations. The teachers acted as moderators and also gave hints. The course was one of the best-graded courses with regard to student satisfaction. The students stated that they learned very much. According to the lecturer, the advantage of applying this method is that students can keep their authenticity with individual feedback. They are not influenced by a standard way of doing a presentation, which would be taught in the traditional way. “Basically we do not teach them anything. We force them to teach themselves and that is a very effective way”, as quoted by the teacher responsible for the course.

11.2.4. Setting of entrepreneurship teaching

For FELU students, the EE courses take part in faculty rooms. At FELU, “pragmatic” prototyping rooms with relevant tools such as screwdrivers, pliers, drilling machine, etc. have been established (see pictures in the annex) which students in DT use after passing a security and quality test. EE courses at other faculties, i.e. Chemistry, Civic and Geodetic Engineering, Computer and Information Science, and Natural Sciences, are held by FELU teachers, but there are no prototyping rooms available.

11.2.5. Instructors: teachers and mentors

Professors, other employees and external lecturers of the university

The academic department of entrepreneurship at FELU comprises nine teachers (see full list in the annex). There have been four full professors until July 2014. In July 2014, Prof. Dr. Tea Petrin and Prof. Dr. Aleš Vahčić, who initiated DT at FELU, retired but are still active in the EE unit. In addition, two assistant professors and five teaching assistants give lectures in EE. Guest lecturers, e.g. from companies in Prof. Vahčić’s network, are invited to complement the lectures, also in the courses taught with the DT approach.

Out of the nine active professors, assistant professors and teaching assistants, four apply the DT method. One assistant professor, Prof. Dr. Anja Nabergoj, teaches regularly in Stanford at the d.school leveraging the experiences between the two institutions.

“Real entrepreneurs” as teachers

FELU’s entrepreneurship unit also comprises two entrepreneurs, Dr. Rok Stritar and Blaž Zupan, MSc. They are fully employed at FELU while running their companies (see further details in section 1.6.1). They teach mostly in courses including DT, e.g. Entrepreneurship, Entrepreneurial Projects, Development of Entrepreneurial Opportunities, Effective Presentations. Both are also involved in research on entrepreneurship. Dr. Rok Stritar completed his PhD thesis at FELU, while Blaž Zupan is actively researching DT in his doctoral studies. As entrepreneurs, they intend to give direct, “real life” feedback to the students. Since they see students as responsible for their entrepreneurial projects, they give them more freedom in the courses in terms of organising their work and limited attendance in seminars. The increased freedom seems to work especially well for students with high motivation and involvement. It is

discussable whether the direct feedback and the increased self-responsibility foster the learning impact on students with low motivation and low self-confidence. One interviewee mentioned the low level of active involvement in one of the courses. On the other hand, some interviewees mentioned that more freedom, for instance, in terms of choosing their own problem, often leads to increased motivation and involvement.

11.2.6. Management of entrepreneurship education

In the academic department of EE at FELU, new teachers are introduced to DT through an informal “master-apprentice” model. Inexperienced teachers start co-teaching with experienced DT teachers. As they receive feedback throughout the courses by the experienced teachers and by the students, they become increasingly independent. In 2006, after Prof. Vahčič introduced DT at FELU, he started involving Anja Nabergoj, Rok Stritar and Blaž Zupan in teaching the methodology. Mateja Drnovšek shortly joined thereafter and received, together with Anja Nabergoj, additional DT coaching at the d.school in Stanford. Today, all of them teach DT autonomously in their courses. The informal “master-apprentice” qualification system continues with new and young teachers.

11.3. Extra-curricular activities in entrepreneurship education

Overview about extra-curricular entrepreneurship activities

Extra-curricular activities at the University of Ljubljana related to EE comprise start-up weekends, consulting as well as workshops and presentations for external organisations.

Exhibit 3: Overview about extra-curricular EE activities at the University of Ljubljana

No.	Name	Contents	Target group	Offered since [year]	No. of participants in 2013/14:
1	Start-up Weekends	DT method / project in one weekend	All students from the University	2014	~ 400
2	Consulting	Projects including DT, teaching the DT methodology	Companies and their employees	2014	30 + 20 (two sub-projects in 2014)
3	Workshops and Lectures	Introduction of DT, working with DT	Other universities, nascent entrepreneurs, governmental organisations, unemployed, established ventures	2006	n/a

Start-up weekends

FELU’s start-up weekends are usually voluntary events. An exception is one mandatory event in the undergraduate course “Entrepreneurial Project 1”. The weekends are open to students from all faculties of the University of Ljubljana, the University of Maribor and Primorska University. Most start-up weekends are, in fact, not organised by FELU but by other faculties or other Slovenian institutions supporting entrepreneurship. However, the structure is similar to the mandatory weekend described above and FELU teachers mentor the teams. For example, one start up weekend in 2014 was sponsored and organised by the University of Ljubljana’s Biotechnical Faculty and its students, but it was open to students from all faculties. The weekend focussed on the topic of “how to create value from wood” since Slovenia has an abundance of forests. In the academic year 2013/14, approximately 400 students took part in six start-up weekends, including the mandatory one.

Consulting

FELU also applied the DT approach in a consulting project for a major Slovenian company on two occasions. The first occasion concerned organisational redesign and strategy building, the second was of a technical nature. There were no students involved in the activities. The participants (30 and 20) were the employees of the company. The consulting work was intended

to teach the DT methodology. The participants were meant to learn how to think and work using the methodology.

In addition, the academic unit conducted consulting projects to solve companies' challenges with the staff of the unit applying DT – for example, increasing the number of visitors of a major Spa and wellness centre in Ljubljana. In those projects there were a few students involved as the "workforce". All of the consulting activities were considered to be successful.

Workshops and lectures

FELU staff members often conduct lectures and small DT workshops outside the University of Ljubljana. For example, the external locations include other universities during university events, for nascent entrepreneurs in the start-up ecosystem in Slovenia, in governmental organisations, for unemployed people (see chapter 1.2.2.), and also in established ventures. The objective of the lectures and workshops is to introduce the DT methodology and to foster problem solving in a DT manner among the participants. The FELU team does not keep track of the number of workshops and participants.

11.4. Institutional aspects of entrepreneurship education

11.4.1. Organisational set-up and change

Application of DT in other faculties

EE including DT already spilled over to other faculties at the University of Ljubljana. A course called "Entrepreneurship" is offered to undergraduate students at the Faculties of Chemistry, Civic and Geodetic Engineering, Computer and Information Science, and Natural Sciences. There is a separate course held at each faculty. Similar to the Erasmus course, the course taught at the other faculties includes a mix of contents of the courses "Entrepreneurship" for FELU students and "Entrepreneurial Project 1". However, in the latter course, there is more focus on project work and DT than in the Erasmus course, so it is more comparable to "Entrepreneurial Project 1". However, no prototyping room can be used because the lectures are held in other faculty locations.

Depending on the faculty and year, usually 60 to 100 students attend the course at each faculty. The courses are conducted by different teachers of FELU's academic Department of Entrepreneurship. Until the academic year 2014/15, the teachers did not co-ordinate themselves much with regard to the content of the lectures at the other faculties. Today, such co-ordination takes place and the content offered in courses other faculties is similar.

FELU offers EE to other faculties when Vice-Deans from other faculties demand for it. One interviewee from FELU said that "it is not that we would be selling our method to other faculties".

Barriers to multi-disciplinarity

Multi-disciplinarity of the DT approach is, apart from a few exceptions, not yet achieved. Exceptions were the courses "Entrepreneurial Project 1 – undergraduate" in the year 2007/2008 and all the start-up weekends. In the course "Entrepreneurial Project 1" in the year 2007/2008, six students from the Faculty of Architecture and five students from the Faculty of Mechanical Engineering joined the 70 students from FELU. In the mandatory start-up weekend in the year 2013/2014, for example, 72 students from FELU and 22 students from the Faculty for Natural Sciences took part. In other words: students from economics and from other faculties do not yet learn and work together in a considerable scope. The following barriers to implementation of multi-disciplinarity in the DT courses were identified:

- Geographical distance: Other faculties are located far away from FELU, as for example, the Electro-Technical Faculty (more than 5 km).
- Professional culture: Engineering students were described as looking down on students of economics, which makes teamwork difficult.
- Resource limitations: Financial funding for prototyping rooms and human resources in terms of teaching capacity is limited at the moment.

11.4.2. Laws, statutes and codes

Legal barriers for students to act entrepreneurially

As regards the implementation of DT and EE in general, the interviewees mentioned several legal barriers in Slovenia influencing the students' mindsets and behaviour and consequently, the work of the academic unit. The barriers were seen as key factors in reducing students' entrepreneurial intention and motivation throughout the courses.

A major barrier to student entrepreneurship in Slovenia is that **students lose their privileges when they start and register their own business**. This is independent of the income they earn. Students' privileges comprise, for example, low taxes for student work and low cost board and lodging. Apart from these obstacles, the students also have to pay extra taxes as soon as they are legally registered as a "solo entrepreneur". In the interviews, a possible workaround was mentioned: if a student wants to avoid losing privileges, his or her father or mother can formally be the owner of the firm, employing the student.

There are also legal barriers for testing ideas in the real world, which is highly relevant when applying DT. If students test their business ideas by trying to sell them to real customers, "they start to break the law very quickly", because **selling a product without having a company is prohibited**. The students sometimes refuse to sell their prototypes due to this reason. Therefore, the EE team at FELU is discussing to set up a legal organisation for this purpose. Students would then be allowed to sell their prototypes in a legal way, invoicing it to the organisation.

11.4.3. Mindsets and attitudes

Socio-cultural issues hampering entrepreneurial mindsets

According to the interviewees, Slovenia does not have a pronounced entrepreneurial culture. Post-socialist mindsets are still very prevalent, especially among the students' parents. They prefer a career of working in public administration, state-owned organisations or large enterprises. Entrepreneurship still has a negative connotation due to the country's history, including the times of system change after 1989 when so-called "entrepreneurs" took advantage of a corruptive environment.¹⁹² Furthermore, it was mentioned that profit is often seen as negative and failure has a strong negative connotation in Slovenia.

On the other hand, as described above, the enthusiasm of many students in EE courses, the large number of participants in voluntary entrepreneurial workshops, and the interest among pupils to become involved in entrepreneurial projects indicate a mindset change among young people in Slovenia.

11.5. Outreach to external stakeholders of entrepreneurship education

After the civil war, an **infrastructure of entrepreneurship** was built up in Ljubljana, including incubators, venture capital providers, and GEA College, a privately owned business school specialised in teaching entrepreneurship. They are all working closely together with FELU. Prof. Petrin played a significant role in helping to set up this infrastructure.

Prof. Vahčič used his networks with **companies** for starting projects in the entrepreneurial project courses: up to ten practitioners per course were involved presenting companies' challenges, which the students solved using DT. Today, the students work more on their own projects, since in the past, the companies' problems were sometimes too narrow for a group project, according to one interviewee. Working on practitioners' and real companies' challenges is therefore now only a part of two courses, "Technological Entrepreneurship" at graduate level, and the MBA course "Business Design".

Yet, **guest speakers** from practice regularly complement the EE classes. For example, in the course "Entrepreneurship" at undergraduate level, four to five practitioners are involved per semester. Even in the theoretical course "Theory of Entrepreneurship", Prof. Petrin always

¹⁹² It was said that there were a lot of "stories in the media".

invited three to four guest speakers from start-ups, from existing ventures or social entrepreneurs.

External stakeholders are also involved in the **Board of the Faculty of Economics**. It consists of 28 members, all of them prominent persons from the business world. In former times, only large companies were represented in the Board. Through the initiative of Prof. Tea Petrin, two directors from two smaller high-tech and biotech ventures are now included: Ivo Boscarol (Pipistrel, light aircrafts¹⁹³) and Dr. Aleš Štrancar (Bia Separations, biotech separation materials¹⁹⁴). The Board discusses FELU's programmes including the EE programme and the qualification of students from Slovenian universities.

11.6. Impact and lessons learned

11.6.1. Measuring impacts of entrepreneurship education

Impact evaluation methods applied

At FELU, impacts of entrepreneurship education in general and of applying the Design Thinking approach in particular are measured in course feedback. Course evaluation happens through a standardised survey of the University at the end of each course. According to one interviewee, for detailed course feedback, especially with regard to the application of DT, the survey does not provide enough information. In order to gain additional feedback, DT teachers conduct either an additional written survey or a feedback discussion in one class. However, the additional feedback is not standardised: each DT teacher organises it in his or her own way.

The suitability and the impact of the DT method can to some extent be concluded from examples in this case study: students create valuable business ideas; a high share of unemployed people participating in a DT course finds a job; DT has been successfully tested in primary schools; and external stakeholders are interested in developing the approach further. One of the most valuable business ideas, for example, may be a mountable set which can transform any bicycle into an electrical bike at rather low cost.¹⁹⁵

FELU does not as yet keep track of graduate start-ups and does not follow the students' careers after they leave the university.

Start-ups evolving from DT at the University of Ljubljana

The case study identified three examples where teaching EE with the DT method was applied particularly effectively for starting and growing new ventures. In these companies, DT was also applied as a way of thinking and leading a business.

The first company, **KIBUBA**¹⁹⁶, sells outdoor equipment and is owned by FELU teacher Dr. Rok Stritar. The company was founded in 2005 and opened an internet shop two years before DT was introduced at FELU. Since it sold only over the internet, its revenues were low. The company then followed with opening additional retail shops. This proved to be a successful strategy. Since finding the right location for a shop is difficult, the company opened 13 shops in Slovenia and closed eight of them again in a trial and error process. For Rok Stritar "it's a success" as the remaining five shops are running very well. Today, KIBUBA is the second largest company in Slovenia in this market and the only company growing in the industry.¹⁹⁷ Three competitors went bankrupt. With regard to DT, he stated that for him personally, it was a parallel process in developing as "a design thinker" in the university and in his company. According to him, the most important aspects of DT helping the company to succeed are: a deep understanding of the customer, related to challenging the key assumptions of the company's offers, the "bias toward action instead of thinking" and the iterative trial and error process in building the shops, while losing as small amounts of money as possible.

¹⁹³ See <http://www.pipistrel.si/>.

¹⁹⁴ See <http://www.biaseparations.com/>.

¹⁹⁵ The case researcher tested the prototype.

¹⁹⁶ See: <http://www.kibuba.com/>.

¹⁹⁷ KIBUBA's official revenues increased from 552,000 euro in 2009 to 1,282,000 euro in 2011 to 1,625,000 euro in 2013.

The creation of two other companies, **Printbox** and **Optiprint**¹⁹⁸, resulted from DT in one of FELU's entrepreneurial project courses. Printbox and Optiprint are based on the same technology but have different business models. The problem that both ideas solve is the high costs of colour printing: a box with a sufficient amount of ink is installed in a printer, which lowers the printing cost significantly as the ink itself is very cheap. However, the innovation was not mainly in the technology but in the business models, which evolved in applying DT in several rounds, such as asking potential customers and understanding the real needs and problems beyond costs. Printbox now offers public printers where people can print at a low cost.¹⁹⁹ Optiprint rents printers including the ink-box to companies and schools, offering flat rate printing at a certain price per month. Optiprint was found to have been very successful: revenues increased from 3,430 euro in 2009 to 766,334 euro in 2013. Optiprint employs approximately 20 people in Ljubljana and has seven more franchises in Slovenia, one in Croatia, and one in Bosnia.

11.6.2. Lessons learned

Summary of lessons learned from this case

Implementing DT at the University of Ljubljana, primarily in the Faculty of Economics, had positive impacts on entrepreneurship education. Several downsides of more traditional EE approaches, e.g. a focus on writing business plans and teaching in an ex-cathedra way, could mostly be overcome:

- Applying DT can **trigger creativity**. It was mentioned that DT also fosters creativity in students who usually do not think creatively or do not have the opportunity to engage in a creative way.
- DT helps **exploring real problems of real customers**. DT may change potential entrepreneurs' behaviour from pursuing "their idea", which may lead to failure towards identifying customers' problems up front or at least matching the initial idea with early customer feedback. The iterative process with the involvement of customers at different stages can be regarded as suitable for achieving a fit between customer needs and a business solution, as shown by the company example Optiprint.
- DT can represent the **practical component in EE**. In applying DT, students have to work in a practical way, such as communicating with customers and through building and testing prototypes. They "think with hands", which can be regarded as helpful if not a necessary complement in EE as it reveals new insights during the development process. Additionally, students learn a set of practically relevant skills and methods and an overarching way of combining them. Those skills may be relevant not only for start-ups but also for innovation management in established companies. With regard to the practical component of EE, one lecturer stated that the need to develop a prototype can be seen as the "most powerful aspect of the DT approach". Students mention that finally they can "do something" after sitting in classrooms for several years, which might be interpreted as a factor for increasing student motivation.
- DT can support the **generation of valuable business ideas**. DT projects can also add tangible social value when the projects and solutions target, for example, local community problems. This was the case of FELU's DT project with primary schools.
- DT may help to **attract business practitioners** to engage in EE, as for example, Slovenian entrepreneur Sandi Češko, or the companies working with students in the entrepreneurial project courses.
- DT can lead to a **shift in the mindset** of students, teachers, pupils and unemployed people. DT can help them to feel capable and self-confident. A part of them might apply DT as a general philosophy, also in their everyday lives.

¹⁹⁸ See <http://www.optiprint.si/>.

¹⁹⁹ The German newspaper "Die Welt" labelled it as one of the most interesting innovations at the CeBIT. See <http://www.welt.de/wirtschaft/webwelt/article138468928/Das-sind-die-originellsten-Gadgets-der-CeBit.html>.

As regards course contents, several offers at the University of Ljubljana may be considered as exemplary:

- The **start-up weekend** was found to be a suitable activity with regard to diminishing the problem of motivation and achieving multi-disciplinarity. It may be a good way to integrate students and teachers from different departments and disciplines.
- Having group work and individual work on **real entrepreneurial projects** (or on projects from external companies) applying DT may be a successful approach.
- The **“Three Euro Challenge”**, i.e. developing and selling products and services with an initial investment of 3 euros may constitute a suitable activity to experience entrepreneurial behaviour in real life.
- The application of **DT for unemployed people and in primary schools** may be a good example to foster entrepreneurial mindsets.

Limitations and challenges of the DT approach

However, the implementation of DT at FELU also revealed limitations and challenges of the DT approach. Several interviewees mentioned that DT should not be considered as a “religion”, “being better than any other method in the world”. Some mentioned it should rather be considered as a method that is hand-in-hand with other methods.

The **motivation of students is critical** in applying the DT approach intensively because the DT approach is based on self-motivation. Students who do not have an entrepreneurial mindset or entrepreneurial intentions and who just want to pass the course can be difficult to motivate, especially when DT is applied in several courses and events.

To avoid or to at least diminish this effect, a **high level of teacher involvement and trust building is important**, especially for undergraduate students and in the initial classes applying DT. According to one teacher, a course would ideally have three instructors for 50 students. Applying DT in courses with a high number of students is a challenge, as the free rider problem increases and “many students get away without having real exposure to the methods”. However, using DT in a mandatory course to all students of economics at a large faculty, which is the case with the course “Entrepreneurship” at FELU, may be a good way to introduce the method to all students, even those without a specialisation in entrepreneurship.

A key means to increase the motivation of the participants is their **own selection of customers, problems and ideas** to work on. The participants feel more involved with their individual ideas and projects. Imposing problems or topics to work on might be suitable at the beginning to explain the method, but very likely lowers motivation. Up-front idea generation and self-grouping before the course with the help of organised market places may be a suitable means to support the students’ self-selection. Offering elective courses is also a possibility to use self-selection to exclude unmotivated students, especially at a later stage in the curriculum. Personally encouraging students to try and test their ideas was found to be important.

“Overdoing” should be avoided, as several DT courses with comparable learning objectives might annoy students. If more courses use DT, they have to be co-ordinated to align learning outcomes. FELU distinguishes, for example, between being introduced to DT, focusing on exploring customer problems, solving companies’ problems, and building one’s own business. It is important, however, that several opportunities with DT courses are offered for motivated students, also to help them progress with their own projects.

Human and financial resources are critical to DT success. Teachers have to take the role of coaches, being able to help students at the point when they have a problem. This requires a broad set of skills and a different behaviour compared to traditional teaching. Ensuring a high number of teachers in a DT class and working with the students intensively requires a larger number of staff at the academic unit. However, the FELU case shows how DT classes with a higher number of students can also be managed.

Limited **human resources** also hinder the spreading of DT to other faculties and institutions if deemed useful. Applying DT in interdisciplinary teams, not only among students but also among teachers, may be beneficial but can be organisationally complex and costly. With the location of FELU and the distance to other faculties, it is difficult to organise interdisciplinary teams.

As regards **financial resources**, the case study found that prototyping facilities are needed to effectively use DT, despite the possibility of applying it without any prototyping room and material. Installing “pragmatic” prototyping facilities in universities, high schools and elementary schools might be a valuable investment. One interviewee made a tentative calculation for the rollout of DT and prototyping rooms across the country. He estimated an investment of 10,000 – 25,000 euro for a prototyping room and a sum of 25 – 30 million euro for the whole country, for all faculties in universities, approximately 250 high schools and 750 primary and elementary schools in the whole country.

Transferability to other universities

The DT approach can be supportive for EE due to its orientation towards customers and problems, the triggering of creativity, the need for prototyping and the insightful trial and error process. As a hands-on methodology with an iterative learning process oriented toward practice, the DT approach or a similar method could also be applied at other universities, at least as a complement to EE. The **main preconditions** are, on one hand, **human and financial resources**, as usually a relatively high number of teachers is required in a DT course, and prototyping facilities. On the other hand, **the will and the capabilities of the teachers to act as a coach to support the students**, instead of teaching them, can be regarded as an important precondition. The required mind-set and the capabilities of the DT teachers might pose a challenge when introducing DT into a “traditional”, ex-cathedra teaching environment.

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Annex

Prototyping facility at FELU



Two prototyping rooms for project work in the DT courses are located in the basement of FELU.

List of teachers at the academic unit of entrepreneurship at FELU

Status: end of 2014

- Prof. Dr. Mateja Drnovšek, head of academic unit / teaching with DT method
- Prof. Dr. Boštjan Antončič, full professor
- Prof. Dr. Jaka Lindič, assistant professor
- Prof. Dr. Anja Nabergoj, assistant professor / teaching with DT (also in Stanford)
- Dr. Patricia Kotnik, teaching assistant
- Dr. Rok Stritar, teaching assistant, entrepreneur (Kibuba) / teaching with DT
- Dr. Alenka Slavec, teaching assistant
- Blaž Zupan, MSc., teaching assistant, entrepreneur (Optiprint) / teaching with DT
- Lidija Bršič, MSc, teaching assistant
- Prof. Dr. Tea Petrin (retired as of July 2014), full professor
- Prof. Dr. Aleš Vahčič (retired as of July 2014), full professor, initiated DT at FELU

12. University of Lüneburg, Germany: Developing a comprehensive approach for diverse target groups

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Abstract



The Leuphana, University of Lüneburg, is a medium-sized university without the classical faculties that have a certain affinity with entrepreneurship. The principal approach "Humboldt and Schumpeter" was developed with the objective of creating links between the field of entrepreneurship (as part of the Faculty of Business and Economics) and, in particular, the three non-economic faculties: the Faculty of Education, the Faculty of Humanities and Social Sciences, as well as the Faculty of Sustainability. The approach is connected with the hope for constructively breaking down reservations academic staff and students of these faculties might have towards an economization of contents and objectives of education. Therefore, the Leuphana follows an integrative and comprehensive approach of entrepreneurship education. This aim is to get as many students as possible in contact with the issue of entrepreneurial thinking and behaviour. The other objective is to help develop the general competence in students to turn ideas into action. The Leuphana supports entrepreneurship education initiatives in all faculties and offers a variety of curricular and extra-curricular activities targeting different groups – from students without any knowledge about entrepreneurship to nascent entrepreneurs. The curricular and extra-curricular offers are designed or supported and coordinated by the Entrepreneurship Hub – a centralised unit that also comprises the start-up service, the career service and the transfer service. A notable feature is the overall presence and visibility of the strategic orientation of promoting entrepreneurial thinking and behaviour consistent with societal issues. To ensure that the activities in different third party funding projects work in synergy respective strategies are strongly recommendable. To guarantee didactic quality a continuous co-ordinated development is necessary.

Case study fact sheet

<ul style="list-style-type: none"> ▪ Full name of the university and location: 	Leuphana University of Lüneburg
<ul style="list-style-type: none"> ▪ Legal status (e.g. public or private) 	Foundation under public law ²⁰⁰
<ul style="list-style-type: none"> ▪ Location (if applicable: branches): 	Scharnhorststr. 1, D - 21335 Lüneburg - Main campus Other Campi: Rotes Feld, Volgershall, Sülztorstrasse
<ul style="list-style-type: none"> ▪ Year of foundation: 	1471. Emperor Friedrich III grants permission for founding a Higher School for Law in Lüneburg 1946: Foundation of a Pedagogical University (PH) in Lüneburg 1989: Lüneburg officially becomes a university on the 1 st of May, 1989, by parliamentary decree of the State of Lower Saxony. 2003: The University of Lüneburg is one of the first five universities in Germany that is transformed into a foundation under public law. It is thereby granted the highest level of autonomy among public universities. 2006: Approval and implementation of a fundamentally new alignment of the University. The objective is to establish a model university in compliance with the Bologna process and to introduce tiered bachelor and master degree programmes. 2007: As a result of the new strategic alignment, the University is named Leuphana University of Lüneburg in March 2007.

²⁰⁰ See <http://www.leuphana.de/en/about-us/profile.html>, last access 18/8/14.

	<p>2007: The College for undergraduate education opens.</p> <p>2009: The Professional School for continuing education and business outreach programmes opens its doors.</p>
<ul style="list-style-type: none"> Number of students: 	<p>7,000 students, thereof approx. 6% international students</p> <p>Intake: 1,800 undergraduate and 700 graduate students per year (Approximate numbers for 2012)</p>
<ul style="list-style-type: none"> Number of employees (broken down by teaching, research and administrative staff): 	<p>Professors: 160, thereof 130 full professors, ten assistant professors, 20 professors receiving third-party salary, and another five extraordinary professors plus visiting and research professors</p> <p>Research assistants: 440</p> <p>Scholarship holders: 100</p> <p>Associate lecturers: 300</p> <p>Administrative and technical staff: 420</p> <p>(Approximate numbers for 2012)</p>
<ul style="list-style-type: none"> Budget in most recent financial year: 	<p>Total annual budget: approx. €110.68m Euro (plan for 2013), allocated as follows:</p> <p>Federal state funds: approx. €54.16m</p> <p>Co-financing of EU project 2010-2015: €2.45m</p> <p>Special funds: €10.83m</p> <p>Third party funds: approx. €29.35m</p> <p>Student tuition fees: approx. €4.75m</p> <p>Other: approx. 11.6m</p> <p>"Innovation Incubator Lüneburg" EU Project 2010-2015: Total of approx. €98m, of which €86m funded by the EU and the Federal State of Lower Saxony.</p>
<ul style="list-style-type: none"> Academic profile: 	<p>Development as a humanistic, proactive, and sustainable university.</p> <p>Four faculties: Education, Humanities and Social Sciences, Sustainability, Business and Economics</p> <p>Three schools: College (bachelor studies), Graduate School (master and doctoral studies), Professional School (continuing education for professionals)</p> <p>Six research centres, one centre of methods, three interfaculty institutions</p>
<ul style="list-style-type: none"> Entrepreneurial profile: 	<p>The University has identified a total of seven main themes that will characterise civil society in the 21st century. One of the themes is: entrepreneurship and economy.</p>
<ul style="list-style-type: none"> Activities focused in this case study: 	<p>Interplay of curricular and extracurricular activities as well as the institutional anchoring. Broad overview and examples for interesting practice.</p>
<ul style="list-style-type: none"> Case contact person(s): 	<p>Dr. Mark Euler, Member of Management Board of the Entrepreneurship Hub</p> <p>Prof. Dr. Reinhard Schulte, Professor for Start-up Management, Member of the Institute for Corporate Development</p>

Information included in this case study is from end of year 2014 unless stated differently.

12.1. The university's entrepreneurial profile

12.1.1. The university's overall approach to entrepreneurship education

The Leuphana is a medium-sized university without the classical faculties that have a certain affinity for entrepreneurship, such as engineering and the like. Starting with an endowed chair in Start-up Management (which was taken up by Prof. Dr. Reinhard Schulte in 2002), the subject was anchored at the university and publicized internally. Later on, Lüneburg was able to successfully raise further funds in the context of entrepreneurship (cf. 1.1.2).²⁰¹ The Leuphana achieved excellent rankings, first in the "Regensburger Studie" with Lüneburg ranking first in 2005, coming in seventh place in 2007 and in fourth in 2011. In 2012, the Stifterverband für die Deutsche Wissenschaft (Association for the Promotion of Science and Humanities in Germany) replaced the "Regensburger Studie" with the creation of a "Gründungsradar" ("entrepreneurial radar"). In the years 2012 and 2013, the university was awarded first place among universities with a number of students between 5,001 and 15,000. All these successes not only led to national attention, but also increased regional recognition. Over the course of time, the Vice President could be seen as the promoter of power, who systematically pursues the subject at the university as well as in the region.

The endowed professorship was changed to a full professorship with adequate resources in 2007. As part of the last call for the national research funding programme EXIST 4 (2013), which was fundamentally supported by the chair, the principal approach "Humboldt and Schumpeter" was developed. The objective was to create links between the field of entrepreneurship and, in particular, the three non-economic faculties: the Faculty of Education, the Faculty of Humanities and Social Sciences, as well as the Faculty of Sustainability. The approach is connected with the hope for constructively breaking down reservations academic staff and students of these faculties might have towards an economisation of contents and objectives of education (cf. 1.1.2). In the framework of parallel funding through a major EU-project regarding the formation of clusters to foster regional development (2010-2015), the topic of financing start-ups could be integrated by the university with a corresponding set of measures. This leads to an ongoing synergy in its daily business.

The curricular and extra-curricular offers are designed, supported and coordinated by the Entrepreneurship Hub. The Entrepreneurship Hub is a centralised institution with competent staff and adequate equipment that comprises of the Start-up Service, the Career Service and the Transfer Service. The institution counts approximately ten staff members who have differing functions in the field of start-up funding and entrepreneurship education. On one hand, direct start-up support is offered: there is information and counselling for start-ups, potential company founders are supported in their networking, coaching for founders is offered and selected start-up projects can benefit from a business accelerator. The academic staff is also represented in the hub, with a double-function. It coordinates the existing courses and curricula, develop new offers and is in charge of the internal and external marketing for the entrepreneurship courses. Staff is highly committed on an organisational scale, which is reflected in the fact that team members voluntarily offer additional courses besides their engagement in actual start-up support. In addition to the centralised approach, in all four Faculties specialist mentors are found: Professor Dr. Schulte, with the Chair in Start-up Management in the Faculty of Business and Economics, Junior Professor Dr. Jantje Halberstadt, with the Chair in Social Entrepreneurship (an Assistant Professor) in the Centre of Sustainability Management within the Faculty of Sustainability, Professor Dr. Pez in the Faculty of Humanities and Social Sciences and, Prof. Dr. Fischer in the Faculty of Education. There is generally a great acceptance for this topic within the Faculty of Education, for it is part of their curricula.

With a view to the aspects of the institutional consolidation as well as the curricular and extra-curricular course offers, the following can be stated:

Entrepreneurship Education at the Leuphana is characterised by a solid institutional embedment, which can be seen in the comprehensive motto of "Humboldt and Schumpeter", the university management's commitment, the Entrepreneurship Hub's centralised approach as well as the decentralised endorsement through partners and specialist promoters within the faculties.

²⁰¹ The programme "EXIST— Start-Ups from Universities" is a policy initiative of the German Government to stimulate entrepreneurship at German institutions of higher education.

The university succeeds in managing the balancing act between educational ideals and societal values, such as the awareness of a social responsibility versus the economisation of ideas right from scratch. In the first obligatory semester at the Leuphana, students dedicate themselves to science and the resulting societal responsibility. They concern themselves with the good life and linked with it, the question of generating an income and of entrepreneurial thinking and action, necessary for any kind of social initiative. As the semester is mandatory there is a need for curricular interpretation (cf. 1.1.2., see other chapters). A particular strength in the area of curricular offers is the holistic view of the subject. Both teaching personnel and the consultative and assisting Entrepreneurship Hub staff work on the subject in a competence-oriented and integrative way right from the beginning. This results in the imparting of entrepreneurship in the context of the respective discipline and within the framework of existing offers and their further development.

An overall trend at the Leuphana can be observed, namely an increase in accrediting course offers that were originally thought to be of extracurricular nature. This is guaranteed through so-called "complementary studies", which are an integral part of all the study programmes and comprise of entrepreneurship offers that students can choose from. Also the programme "Enterprise Academy", which was originally conceptualised solely as a (non-certified) training offer, can now be accredited as an elective subject. The offer is accompanied by extracurricular activities, usually established formats, such as Students2Startup or ENACTUS. Their concepts were designed elsewhere, are repeated regularly and are accompanied and supported by the Entrepreneurship Hub staff. Extracurricular offers serve to raise awareness for the subject among the students in order to gain their interest for the established curricular offers.

Some aspects of the Leuphana approach are already published in the "Gründungsradar" (entrepreneurial radar) 2012 (p. 47ff) but solely with the focus on start-up support. Parts of the approach in a broader sense are published in German in Euler (2012, 243ff). An image brochure is planned.

12.1.2. Leadership and governance

Importance of government strategies

In the year 2002, the endowed Chair in Start-up Management was established at the Leuphana University of Lüneburg. The Federal State of Lower Saxony provided the funds for the Chair and for the equipment of the Chair. Further costs for personnel and material were assumed by the "Sparkasse Lüneburg" as main sponsor as well as by other enterprises within the Lüneburg-Wolfsburg Chamber of Industry and Commerce and by the Stifterverband für die Deutsche Wissenschaft (Association for the Promotion of Science and Humanities in Germany) over a period of five years. Since 2007, the Chair is being financed from university funds.²⁰² Looking back, the endowed Chair can be seen as a triggering event for the establishment of a university-wide entrepreneurship education.

Especially due to the initiative and commitment of the president of the Leuphana University, Professor Dr. Sascha Spoun, Lüneburg region receives funding by the European Fund for Regional Development (EFRE). The major funded EU-project "Innovation-Incubator Lüneburg" has the basic idea of strengthening the regional economy with research. The total amount of funding is around 100 million EUR, from which approximately 64 million is from the EU, 22 million is from the Land of Lower Saxony and around 14 million is by the university itself. The major project consists of 16 different work packages, including the project "promotion of start-ups" with a budget of around two million euros. This measure is subdivided in three modules: A) Start-up counselling, fostering links and networks in the entrepreneurial ecosystem, and information about start-up management, B) Coaching and further Entrepreneurship Education and C) Business Accelerator (intensive support of selected start-up teams).

Additionally, in 2013 Leuphana University was awarded one of the best Entrepreneurship Universities in Germany in the competition "EXIST-Gründungskultur" (entrepreneurial culture), financed by the Federal Ministry of Economics and Technology²⁰³. The awarded approach is

²⁰² See <http://www.leuphana.de/news/meldungen/ansicht/datum/2008/08/19/rueckblick-auf-fuenf-jahre-stiftungsprofessur-existenzgruendung.html>, last access 19/8/14

²⁰³ See <http://www.exist.de/exist-gruendungskultur/gruenderhochschule/projekte2013/02118/index.php> and <http://www.leuphana.de/themen/wirtschaft/entrepreneurship.html>, last access 23/8/14.

called "Leuphana 2020 – Humboldt plus Schumpeter" and is funded by EXIST IV from 2013 to 2016 with approximately 1.5 million EUR of which the amount 300.000 EUR is co-financing by the university. The activities in this project are combined and coordinated in a special new work unit called Entrepreneurship Hub, which also integrates and coordinates the activities in the work package "promotion of start-ups" ("Innovation-Incubator").

The funding by the EU and the German Government (EXIST) can be seen as another triggering event. Entrepreneurship education could achieve a broad effect in the university due to the activities of the Entrepreneurship Hub. Under the Leuphana EXIST programme there is at least one annual offer covering the entire university concerning the topic „Humboldt plus Schumpeter“. For example, the Start-week took place with 1,800 students in 2012, and was on the topic "Start Up!"²⁰⁴)

Importance of entrepreneurship in the university's strategy

The Leuphana sees itself as a humanistic, sustainable and proactive university. Regarding being "proactive" the university points out: "Leuphana fosters the development of responsible and proactive individuals who demonstrate the creativity and thoughtfulness as well as the willingness and ability to creatively shape society. Leuphana contributes significantly to the solution of social problems through research, education, continuing education, and academic services."²⁰⁵ Some interviewees pointed out that the Entrepreneurship Education approach at the Leuphana fits perfectly in this statement and also in the other key concepts. As seen on the websites the university has identified a total of seven main themes that will characterise civil society in the 21st century. One of the themes is "Entrepreneurship and Economy".²⁰⁶ At another prominent place on the website, they explain, "Entrepreneurial activity is not an end in itself. Entrepreneurs do more than develop new markets – they also create added social value: by creating new jobs, through ideas with a beneficial impact, and through innovative approaches. Entrepreneurial activity calls for an ability to discover market opportunities, to gain acceptance for innovations and to take calculated risks to bring ideas to life. But it also means taking responsibility for employees, for the environment and ultimately for society itself."²⁰⁷

This entrepreneurial orientation can be found in several activities being part of a holistic strategy. In the awarded approach with the label "Humboldt plus Schumpeter", they combine a humanistic view with an economic view, taking into account classical educational ideals as well as innovation and change (see also 1.1.1). Therefore, entrepreneurship is not restricted to start-up-management or intrapreneurship but embraces issues such as being head of one's own professional life, taking into account the civil society and social issues. As told by interviewees, the issue of Humboldt and Schumpeter is integrated in the whole university and is addressed in several occasions during the Freshman Year. Furthermore since 2007, all students have to pass the Leuphana Freshmen Week which is an integral part of the Leuphana University's new model of studies. Every year is dominated by the development of a practical project.²⁰⁸ In 2012 the topic of the Freshman Week was "Start Up!"²⁰⁹

The topic entrepreneurship is part of the tasks of the Vice President for Professional School & Information Technology, Prof. Dr. Burkhardt Funk.

Extent of high level commitment to implementing entrepreneurship

By some of the interviewees the Vice President Prof. Dr. Burkhardt Funk (see above) is seen as the figurehead of the entrepreneurship hub together with the chair of start-up Management (Prof Dr. Reinhard Schulte) and both as highly committed to entrepreneurship education. Prof. Funk himself was involved in several start-ups in the area of new media.

The President, Prof. (HSG) Dr. Sascha Spoun is also highly committed to the issue of entrepreneurship as seen on the websites but also as it was stated by some of the

²⁰⁴ See <http://www.leuphana.de/studium/bachelor/leuphana-semester/startwoche-2012.html>, last access 23/8/14

²⁰⁵ See <http://www.leuphana.de/en/about-us/profile/mission-statement.html>, last access 23/8/14.

²⁰⁶ See <http://www.leuphana.de/en/topics.html>, last access 23/8/14.

²⁰⁷ See <http://www.leuphana.de/en/topics/economy.html>, last access 25/8/14.

²⁰⁸ See <http://www.leuphana.de/en/study/bachelor/leuphana-semester/freshmen-orientation-week.html>, last access 25/8/14.

²⁰⁹ See <http://www.leuphana.de/studium/bachelor/leuphana-semester/startwoche-2012.html>, last access 25/8/14.

interviewees.²¹⁰ According to the interviewees, the president also is highly committed because of strategic reasons: The new name in 2007 “Leuphana” was the symbol for a new strategic alignment. Lüneburg started repositioning itself in the academic market as a medium-sized university by choosing a special topic, such as entrepreneurship rather than the comprehensive and complex field of business administration. That was the reason for further developing the issue of entrepreneurship together with humanities and social sciences as well as sustainability and thereby creating a “lighthouse”.

Level of faculties’ and units’ autonomy to act

The Entrepreneurship Hub is de facto acting independently. Its head is the Vice President for Professional School & Information Technology, Prof. Dr. Burkhardt Funk. The Entrepreneurship Hub offers some curricular and several extra-curricular activities independently and cooperate with gatekeepers and promoters in the different faculties concerning the respective curricular offers.

In this case, the question of autonomy of the faculties is not relevant.

Organisational implementation

As already described in the sub chapters above, the Entrepreneurship Hub is under the direct supervision of the Vice President and co-operates with all four faculties. To the best of the case-writers knowledge, the Entrepreneurship Hub can be described as a “service unit”: its employees foster the topic by marketing-activities, start-up counselling and extra-curricular offers. On the other hand, they cooperate with the academic staff concerning its curricular activities and they offer coaching and help to develop new concepts of teaching and learning. Therefore, the approach is centralised, with the objective to also strengthen decentralised activities.

University’s importance for driving entrepreneurship in its environment

Some interviewees opined that it will take a long time to change the mindset of the public towards being more entrepreneurial. The university, however, endeavours very much to contribute to this change. For this reason, the Entrepreneurship Hub and many professors are constantly in contact with business enterprises. In a joint effort they also apply for third-party funded projects. The university is involved in the conception and awarding of business awards from the City of Lüneburg. In the past, the awarding used to take place on several days during the year and on different occasions, but is now combined in the “Lünale”, which takes place only once a year.

Entrepreneurship Education is integrated in study programmes of teacher training: The compulsory module „Development of Vocational Education in the Context of Socio-cultural, Political, Economic, Ecological, Technological, and Work Organization Related Changes” is part of the Master of Education (specialisation vocational schools, business administration). Within this module there is one course called “entrepreneurship and employability”, which is designed to create awareness of future teachers in vocational training for the topic of entrepreneurship and entrepreneurial mindset. It is thus an indirect driving force for entrepreneurship.

Another example is a seminar offered in the Master of Management & Entrepreneurship: Business Development, with the title “Start-up Counselling”. Emerging from the regional network, the course leaders present real business ideas. Students analyse the respective needs for consultation, consult the nascent or young entrepreneurs and develop a final report for the clients as well as an internal consultancy report (see course description in chapter 1.2.3).

Another seminar, a so called „project-seminar”, Management of Innovation, integrated in the Master of Management and Entrepreneurship focuses on developing innovative ideas and business models for the regional trade companies in cooperation with the Lüneburg Chamber of Trades. It is organised as an internal idea-competition with up to 250 participants (takes place in summer term) (for detailed description see chapter 1.2.3).

The Social Change Hub (Schub) is a project that supports students to create, develop and implement social business initiatives in the region as a learning field of experience. The Social

²¹⁰ See for example the president’s statement on the YouTube-video on <http://www.leuphana.de/themen/wirtschaft/entrepreneurship.html>, last access 25/8/14.

Change Hub is supported by the professor for social entrepreneurship and offers curricular and extracurricular elements²¹¹ (for detailed description see chapter 1.2.3).

The Leuphana Enterprise Academy is a further education programme for nascent entrepreneurs in the field of knowledge intensive start-ups in the Lüneburg region, being at the same time part of the complementary studies (for detailed description see chapter 1.2.3).

The extent to which graduates start businesses in the region may be an indicator to the university's involvement in the development of entrepreneurship in the environment. As told by the Management Board of the Entrepreneurship Hub, in 2013 a total of 127 counselling cases were reported. 52 persons (students, members from higher education staff or alumni) started a business or started working as freelancers, within which there were 30 solo-start-ups and 22 team-start-ups with three team members each. One third of the start-ups are engaged in the sector of IT and IT-services, another third in the sector of business consultancy and consultancy services, and one third in other sectors, such as advertisement, retail, recruitment services, sports services or gastronomy. 45 of the 52 start-ups in 2013 are situated within a radius of 30 kilometres.

The major EU-project "Innovation-Incubator Lüneburg" organises the competition series "Power of Ideas Meet Science" (Ideenkraft trifft Wissenschaft) aiming at regularly providing new impetus to the regional economy launching different themes. The competition is supported by the "Consortium of promotion of Technology and Innovation Elbe-Weser Region" (ARTIE), the "Transfer Center Elbe-Weser" (TZEW), the Chambers of Industry of Lüneburg-Wolfsburg and Stade as well as the Chamber of Trades of Braunschweig-Lüneburg-Stade.²¹²

12.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

In 2013, the number of individuals involved in entrepreneurship education (teaching, organisation of EE, marketing, organisational implementation etc.) was about 25. Around twelve of them work in the Entrepreneurship Hub or at the Chair of Start-up management. Half of them already have experience in entrepreneurship education and start-up counselling because they have the past experience of working as research assistants at the Chair of Start-up Management or at other universities in similar positions. Two persons were entrepreneurs before and decided to be involved in start-up counselling at the Leuphana. Especially in leading positions, the university recruited persons with experience in entrepreneurship education, start-up counselling and or entrepreneurial experience. They teach from one to eight hours per week in a semester, six of them being involved in the Leuphana Semester and three of them offering courses in the compulsory study area, thus offering courses for students of all faculties. Two of them teach in the Faculty of Sustainability, two of them in the Faculty of Education and twelve of them in the Faculty of Business and Economics.²¹³ Additionally, each semester several lectureships are offered and two third of those assistant lecturers are or were entrepreneurs themselves.

Human Resources in the Entrepreneurship Hub often have a double function: They are involved in the direct support of start-ups from university as well as they are involved in entrepreneurship education.

Financial resources for entrepreneurship education

For information about the extent to which the university's entrepreneurial education objectives are supported by a wide variety of funding sources see chapter 12.1.1.

It is an interesting question how the Leuphana will support entrepreneurship education development in the future after the termination of the funding period by EXIST and the EU. Having a lot of full tenured professors with the subject of innovation and entrepreneurship, or social entrepreneurship, many courses are or will be part of formal curricula. As told by an

²¹¹ See <http://www.leuphana.de/schub.html>, last access 3/9/14, only in German. See also Gründungsradar, 2012, 49. The Social Change Hub was awarded in the program „Deutschland – Land der Ideen 2012“.

²¹² See <http://www.leuphana.de/partner/regional/aktuell/veranstaltungen/ideenkraft-trifft-wissenschaft.html>, last access 04/12/2014.

²¹³ Source: Internal list of the Entrepreneurship Hub.

interviewee, the Leuphana commits itself to maintain the full tenured professors with those subjects, supplemented by fixed term assistant professors (such as the Assistant Professor for Social Entrepreneurship in summer 2014). Concerning future appointment processes, the Leuphana ensures the integration of the topic of entrepreneurship in the professor's teaching and research programme, as well as that the respective professors already have experience in entrepreneurship education and research. Financing the whole chair over long periods, including research assistants and other employees is interpreted by the interviewee as a respective financial commitment.

12.2. Entrepreneurship in curricula and teaching

12.2.1. Overview about curricular offers

In the following overview table you find the curricular entrepreneurship offers of Leuphana of the study period summer 2013 and winter 2013/14. Some of the titles have no entrepreneurship related key words, but do have a focus on entrepreneurship as explained by the staff of the entrepreneurship hub. Some of them take place in English, most of them in German.²¹⁴ There was some official information about the offered courses. Most of them are listed on a platform called "Mystudy", where the offers are partly described.²¹⁵ Frequently, there is no explicit description of objectives or not an explicit distinction between objectives and content upon this platform.

Some examples will be described in detail in the following chapters.

²¹⁴ Titles mostly translated by the case study researcher.

²¹⁵ See <https://mystudy.leuphana.de/veranstaltungSuchen/suche> (mostly in German).

Exhibit 12-1: Overview about curricular EE offers at the Leuphana University, Lüneburg

No.	Name	Objectives	Target group	No. of participants in [year]
1	Orientation week	See annex	Students of first year	1800
2	Summer School in co-operation with TUTECH (Technology Transfer for Technical University of Hamburg-Harburg)	See annex	Academic staff, especially (senior researcher), students from all universities and universities of applied sciences in the region of Hamburg and Lüneburg, (with credits for students in the area of complementary studies) (also extracurricular)	20
3	Create bags for starters – act entrepreneurial to the benefit of the freshmen	See annex	Bachelor Students of all faculties in the area of complementary studies	25
4	Civil Law for Business	See annex	Students of the faculty of Business and Economics	150
5	Managing Entrepreneurial Opportunities (Seminar)	See annex	Students of Business and Economics	30
6	Entrepreneurial Responsibility	See annex	“Leuphana Semester” Students of all faculties in the first study term (freshman courses)	27
7	Sustainable Entrepreneurship (seminar/exercises)	See annex	Students, all, freshman	35
9	Entrepreneurship and International Business (EN)	See annex	BA students, all, complementary	20
10	Entrepreneurship – economic and empiric analysis of start-ups (lecture)	See annex	Students of Business and Economics	25
10	Managing start-ups (seminar)	See detailed description in chapter 1.2.3	Students of Business and Economics	30
11	Principles of business administration based on entrepreneurship (lecture) (in summer and winter semester)	See annex	Students of Business and Economics	650
12	Principles of Business Management: A start-up orientated introduction (exercises) (in summer and winter semester)	See annex	Students of Business and Economics	650
13	Start-up Management (lecture)	See annex	Students of Business and Economics, 3 rd semester	220
14	Start-up Management (accompanying exercise)	See annex	Students of Business and Economics 3 rd semester	220
15	Corporate Sustainability Communication	See annex	Students of the faculty of sustainability	30
16	Basics of Taxation of Entrepreneurial Activities	See annex	Students of Business and Economics	50
17	Social Entrepreneurship in Developing Countries: Supporting Global Sustainability I (seminar)	See annex	Leuphana Semester	25

No.	Name	Objectives	Target group	No. of participants in [year]
18	Social Entrepreneurship in Developing Countries: Supporting Global Sustainability II (seminar)	See annex	Leuphana Semester	25
19	Literature and Money (Tutoring)	See annex	Leuphana Semester	27
20	Training of Entrepreneurs in Developing Countries (seminar)	See annex	Students of Business and Economics	
21	Training of Entrepreneurs in Developing Countries (exercise)	See annex	Students of Business and Economics	25
22	The entrepreneurial Self – an Inventory	See annex	Leuphana Semester	27
23	Business Planning (exercise)	See annex	Students of Business and Economics	220
24	Development of Vocational Education in the Context of Socio-cultural, Political, Ecological, Technological and Work Organisation related Changes: Employability and Entrepreneurship (seminar)	See annex	Students of the Faculty of Education (future teachers in vocational training)	35
25	Leuphana Enterprise Academy	See detailed description in chapter 1.2.3.	BA students, all, complementary (see also extra-curricular offers)	20
26	The Newest Developments in Organisational Behaviour & Entrepreneurship (seminar) (EN)	See annex	Students of Business and Economics	20
27	The Business Decision of a Re-Organisation in Practice in the Tension between Collective and Individual Labour Law	See annex	Students of Education	15
28	General Business Management and Start-up Management (Seminar) (in summer and winter semester)	See annex	Bachelor Students of Business and Economics	15
29	Start-Up Counseling (seminar)	See annex	Students of Business and Economics	18
30	Visionaries, Innovators, Entrepreneurs – Entrepreneurs over the Course of Time	See annex	BA students, all, complementary	25
31	Social Entrepreneurship	See annex	Students of Sustainability	40
32	Salt, Power, Culture: The Mentality of pre-Industrial Entrepreneurs in Lüneburg	See annex	Leuphana Semester	27
33	Models of Social entrepreneurship: TerraCycle as an Example	See annex	Leuphana Semester	27
34	Management of Innovation – Project Seminar	See detailed description in chapter 1.2.3.	Master students of Management and Entrepreneurship (2 nd semester)	250
35	Social Entrepreneurship Project Lab – Development and Planning of Your Own Social Entrepreneurial Project (project seminar)	See detailed description in chapter 1.2.3.	BA students, all, complementary	25

No.	Name	Objectives	Target group	No. of participants in [year]
36	Cultural Entrepreneurship – AnSCHub conference 2015(project seminar)	See annex	BA students, all, complementary	25
37	Integrative Solution of Questions concerning Business Management	See annex	BA students	25

12.2.2. Target groups

Main target groups of entrepreneurship education

A very important target group is students at the beginning of their study programme. As confirmed by the interviewees, those offers follow the approach “Humboldt and Schumpeter”: Most of them are students with no entrepreneurial experience at all. The students should become aware of entrepreneurial thinking and behaviour.

Once the students are aware of the topic, entrepreneurship related courses are offered in the “Complementary Studies”, an integrative part of all Bachelor programmes and cover the four faculties.

The Master of Management and Business Development (Master of Arts) addresses students who are interested in start-ups in general and in a professional career concerning new businesses (Faculty of Business and Economics). The “programme is centred on the challenges posed by change - ranging from establishing and developing a company to controlling its entire value chain and designing public relations.”²¹⁶ As one interviewee indicated, students decide to study at the Leuphana because of this study programme. Students are not necessarily interested in starting a business after graduation.

Another target group are students with the intention to start a company (nascent entrepreneurs). Corresponding programmes are e.g.: “Enterprise Academy” and “Summer School”, (see above) the latter targeting academic staff with business ideas.

Finally entrepreneurship courses address students in the Master of Education, “Teacher Training for Vocational Schools – Economics”.

Entrepreneurship education targets students in specific departments as well as being open to students from all over the university. Gender and diversity is not explicitly tackled.

Concerning the question to what extent is the university aware of different possible target groups, there are no official statements. But the courses in the Complementary Studies (Bachelor); the projects in the Social Change Hub (raising interest and awareness to put ideas into practice); the offers in Master Programmes; the offers for nascent entrepreneurs (such as the enterprise academy as educational offer, and start-up-counselling and support of spin-offs as measures in the area of direct support of start-ups); and the offers in the Master of Education can be interpreted in the way of being aware of different possible target groups.

Statistics from 2012 indicate; introductory courses about entrepreneurship related basics of business management have approximately 1,000 students per year. Seminars in study programmes of economics and business management have approximately 20 to 100 participants each. GMLG Conference of Entrepreneurship, being at the same time a mandatory course in the Master of Management & Entrepreneurship, has an estimated 190 students and 50 guests per year. Offers within the complementary studies in Bachelor programmes have approximately 20 to 40 participants each. Empirical Research Projects and Entrepreneurship Summer School have 20 participants per year (nearly always overbooked). Freshmen’s week “StartUP” with the development of business ideas, had 1,800 students. In 2012, it focused only on start-ups. Since then, it also integrated other topics, such as solving a societal problem with start-up ideas e.g. demographic change in 2014. Statistic numbers in 2014 see Exhibit 1.

²¹⁶ See <http://www.leuphana.de/en/study/master/management-business-development.html>, last access 5/9/14.

Continuous education

The staff of the Entrepreneurship Hub developed the format of the Leuphana Enterprise Academy, which addresses Bachelor students as well as an interested external audience. There is no detailed approach aimed at differentiating between groups generally interested in entrepreneurship, nascent entrepreneurs or experienced entrepreneurs.

There is no information available that offers from other training providers at regional level influence university offers.

As one interviewee said, the development of the continuous education programme is a vision for the future.

Bridges to secondary education

The students participating in ENACTUS (see chapter 1.3.1) develop social business ideas in teams. It sometimes happens that students develop projects with students from secondary schools but it is not an established target group of the programme. The same is also true of the activities of the Social Change Hub. These examples have a direct impact on a certain number of high school students.

Entrepreneurship education is an established offer in the Master of Education, "Teacher Training for Vocational Schools – Economics". Due to this, it has a long-term impact on generations of secondary school students. It provides secondary schools with teachers who are aware of entrepreneurial thinking and behaviour, and know about methods to successfully teach entrepreneurship.

In the year 2011, the members of the Entrepreneurship Hub developed a start-up simulation game for schools that is also used in some seminars and workshops at the university. The pupils are asked to develop an idea for an event management start-up in "sun beach". They learn to analyse relevant data about the market and their competitors in order to set up a business plan for their idea and to calculate their budget. At the end of the first round, they have to pitch their idea in front of potential investors and afterwards the winner of the first round is awarded. But because in real economic interactions the "human factor" also plays an important role, an algorithm like in other simulation games, does not identify the winning team. Instead, a team from the Entrepreneurship Hub analyses and interprets the data and the pitch performance. The simulation game "Next Top Founder" was presented and played first time at the "IdeaExpo 2011" in Hannover and since then, it has been played with more than 400 pupils and students.

In 2015, the Entrepreneurship Hub is going to try a „Guinness World Record“ attempt together with the University of East London and the University of Florida by playing „Next Top Founder“ with about 1,500 students.²¹⁷

There is also a project located at the chair for vocational training (Prof. Dr. Andreas Fischer who is also the entrepreneurship mentor at the Faculty for Education) that deals with fostering sustainability at schools. Here one aspect is also to promote sustainable pupil start-ups at the schools. A regular fair for those start-ups is also organised at the Leuphana in cooperation with SCHUBZ a regional institution for sustainability education located on the campus.

12.2.3. Designing lectures and courses – basic curricular decisions

The overall *objectives* of entrepreneurship teaching at the university are visible in the mission statement of the Leuphana: "**Proactive university:** Leuphana fosters the development of responsible and proactive individuals who demonstrate the creativity and thoughtfulness as well as the willingness and ability to creatively shape society. Leuphana contributes significantly to the solution of social problems through research, education, continuing education, and academic services."²¹⁸ It supports all members of the university in their activities concerning Entrepreneurship and Social Entrepreneurship.²¹⁹

²¹⁷ See <http://www.leuphana.de/themen/wirtschaft/existenzgruendung/qualifizierung/next-top-gruender.html>.

²¹⁸ See <http://www.leuphana.de/en/about-us/profile/mission-statement.html>.

²¹⁹ See <http://www.leuphana.de/ueber-uns/profil/leitbild/handlungsorientiert.html>

Despite the existence of substantial information it was not possible to extract a canon of expected outcomes from the different curricular offers, such as specific entrepreneurship related competences. The same is true for the categories of “contents”, “methods and media”, “informal evaluation of learning outcomes and feedback for students” and “using results of entrepreneurship research”.

From the overall offers selected, interesting formats will be described shortly concerning all aspects mentioned above, in the following. The descriptions also take into account the aspects described in chapter 1.2.4.

Create bags for starters – act entrepreneurial to the benefit of the freshmen (project seminar)

Objective: Students develop a real entrepreneurial project with a given product, such as product development, financing, fundraising and sponsorship, sustainability.

Content: Bases of project-management, development of a respective plan, completion of the plan (designing bags, selection of producers, acquisition of sponsors, supplying the bags just in time etc.), aspects of sustainability.

Methods and media: Students work on the development of the bags for starters independently, mentored by teachers if necessary. The process is sometimes interrupted by teacher oriented presentations of contents.

Target group: Bachelor students /complementary studies

Locations and timing: The course takes place in seminar rooms at the campus within one semester. It consists of weekly sessions of 90 minutes.

Leuphana Enterprise Academy (description taken from already existing materials)

The Enterprise Academy is a comprehensive offer for credits and part of the complementary studies in Bachelor programmes, as well as not for credits with the *target group* of interested students, staff, alumni and external auditorium (extra-curricular offer).

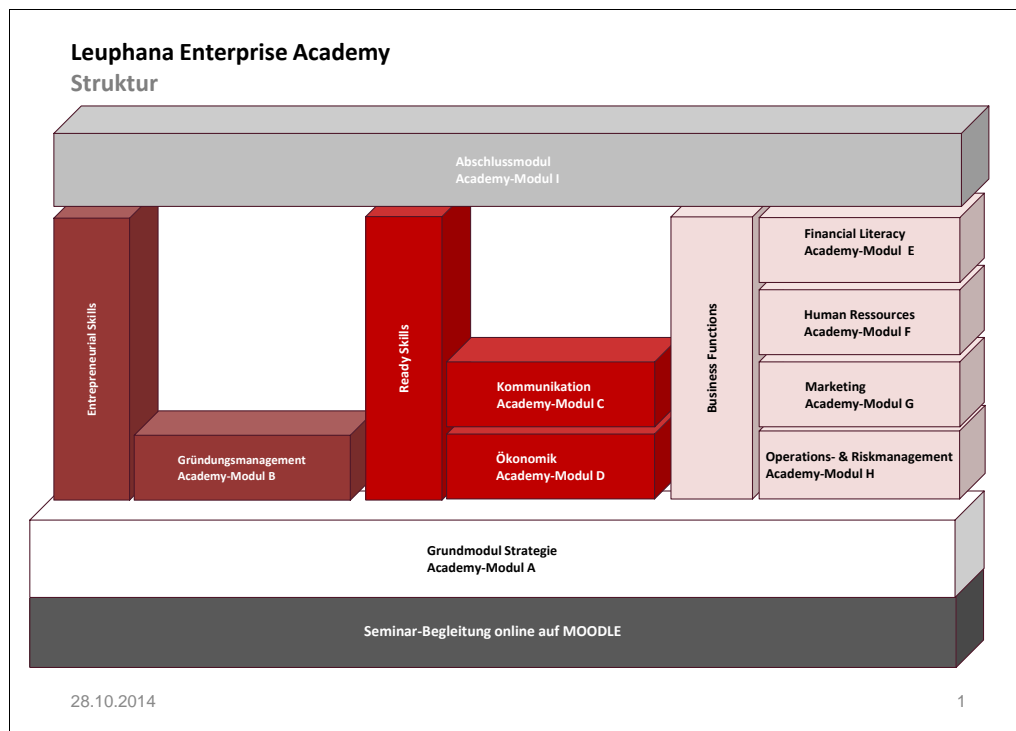
Teacher: Employed academic staff from the university, team teaching with two teachers.

Learning Objectives are integrated in the overall description in the platform Mystudy:

The central objective is to develop students’ entrepreneurial competences and convey a basic knowledge of entrepreneurship based on contemporary research in entrepreneurship education. Entrepreneurial competences entail a self-determined and independent planning and realisation of personal goals in a career plan (“Selbst GmbH”; a personal business for oneself), intrapreneurial activity, or in the context of founding one’s own start-up venture. To achieve this, students learn to analyse complex situations as well as to develop adequate goals and ideas including strategies for implementation. Moreover, students learn and develop skills to writing their own business plans (including essential knowledge in marketing, finance, HR, organization and business law).

The *contents* are based on the “National content standard for Entrepreneurship Education”²²⁰, an effort of an US-consortium, aiming at establishing entrepreneurship as a part of the curriculum for all vocational programmes in secondary and post-secondary education.

²²⁰ See http://www.entre-ed.org/Standards_Toolkit/Helpful%20Downloads/NCSEE%20Website.pdf.



Source: Written material of Dr. Mark Euler

1. Academy-Module A: Strategy and entrepreneurial competency (analysis methods and creativity techniques, strategic management)
2. Academy-Module B: start-up management (personality of entrepreneurs, idea development, business plan, business simulation game)
3. Academy-Module C: Introduction in economics (basics of economic theory, economics and business economics)
4. Academy Module D: Communication (basics of communication, corporate communication, networking)
5. Academy Module F: Human Resources (HR planning, HR management); basics of accounting and business financing
6. Academy Module E/H: operational and risk management, legal basis such as German commercial law, legal form, controlling)
7. Academy-Module G: Marketing (basics such as Marketing Mix, advertising strategy)
8. Academy-Module I: Analysis of "real" business plans

Methods and Media: The format offers different methods, such as role plays, business simulation games, projects, exercises, video based training, guest speakers and case studies and combines theoretical input with phases of practical exercises and sessions. These in-classroom methods are combined with E-learning offers, such as several documents and information available at a platform, a learning diary and a discussion forum. Module B is strictly organized as a blended learning environment.

Informal evaluation of learning outcomes and feedback for students: Reflection upon the contents and experiences of the recent module during a breakfast event. Students get in contact with successful start-up founders.

Locations and timing: The Enterprise Academy takes place in seminar rooms at the campus within one semester. It consists of eight modules and is given in four compact sessions.

Formal evaluation and learning outcomes: Participants have to develop a business plan during the semester, approximately 12-20 pages in individual or team work, along with a final examination.

In case of promising business models, the Entrepreneurship Hub offers a “master-phase” to further develop the business model in a workshop with experts.

For further selected examples of curricular offers, the respective teachers were asked to write down objectives, contents, methods etc. using their already existing course descriptions at the platform or other internal course descriptions and tools. The descriptions also take into account the aspects described in chapter 1.2.4.:

Social Entrepreneurship Project Lab – Development and Planning of Your Own Social Entrepreneurial Project²²¹

The Social Entrepreneurship Project Lab is an offer for credits in the complementary studies and addresses the *target group* of students (maximum number of participants: 25).

Teacher: Employed academic staff from the university, Chair of Social Entrepreneurship.

Objectives: to raise awareness for the concerns of social entrepreneurship; to develop a project that deals with socially relevant issues; to develop a vision of how projects can be further developed; to raise awareness in students about the power to influence society and its change; and to become aware of the importance of financing in social entrepreneurship.

Contents: basic knowledge of how to create a social business and its application, creativity techniques, (social) business canvas, financing, law, marketing.

Methods and Media: Mainly group work with additional, short, teacher-centred presentation; student presentations of results, teacher and students working together; idea generation; joint idea evaluation; and development of selected projects

Informal evaluation of learning outcomes and feedback for students: continuously in the process

Locations and timing: The seminar place in seminar rooms at the campus within one semester. It takes place five times per semester and each session lasts between four and eight hours.

Formal evaluation and learning outcomes: no information available

Start-up counselling (description generated from the official description of the module, the study visit and partly from internal course documentation)

The Start-up counselling is an offer for credits in the Master programme and addresses the *target group* of students (maximum number of participants: 18).

Teacher: Employed academic staff from the university, team teaching with two teachers, one of them holds the Chair of Start-up Management.

Objectives: Students

- Get in contact with real start-up issues.
- Fill the gap between theoretical knowledge and practical application.
- Know about the task of start-up counsellors.
- Know about the basics of start-up counselling and the phases of the start-up counselling process.
- Are able to gather information about a given start up, comprising the company founders as well as the business model.
- Extract the most important aspects of the respective business model and its challenges and provide a basic analysis of requirements.
- Develop basic communication skills to communicate with the founders.
- Give substantial advice to the company founders.

²²¹ This seminar is, as an exception, taken from 2014 as the Junior professor for Social Entrepreneurship only started to work recently.

- Develop a counselling concept and evaluate its quality.
- Present the result of the counselling process in the classroom.

Contents: Definition and different types of start-up counselling, counselling process, analysis of the demand for counselling, structure of counselling process, content of counselling process, communication between counsellor and entrepreneur, and analysis of business plans

Methods and Media: First part of the course includes teacher oriented sessions with presentation of contents. In the second part of the course students work on real challenges of cases from start-up counselling (cases are selected by the teachers) and act partly independently. They get in contact with a given start-up and consult the start-up to a certain extent. They research and analyze the start-up situation independently and develop a written proposal with a solution-strategy. They prepare a presentation. Teachers give advice. Group work in the counselling team, presentation of the results by students, discussion of results in the forum are also included. Teachers act as instructors, contact persons, facilitators and advisors.

Informal evaluation of learning outcomes and feedback for students: After the presentation of the analysis of requirements, students get advice from the teachers and get the opportunity to reflect upon their performance.

Locations and timing: The seminar takes place in seminar rooms at the campus within one semester. It takes place every week in a 90-minute slot.

Formal evaluation and learning outcomes: Participants have to develop a requirement analysis, an interim report, a final report for the client, and a final report concerning the whole process for the trainers. They also have to give a presentation. All elements are evaluated and are combined in the final score.

Project Seminar on the Lecture on "Innovation Management"

Target Group: Students of the Master of Management and Entrepreneurship

Teacher: Academic staff from the university in cooperation with the Chamber of Crafts „Braunschweig-Lüneburg-Stade“

Learning objectives: Running the project seminar as a real idea competition gives students the opportunity to

- Identify demographic challenges in the craft sector
- Develop potential business ideas and concepts for business development
- Evaluate the market potential of these ideas and concepts
- Refine and further develop these ideas within the idea competition programme
- Present the feasibility of their sketch of ideas in front of a jury of representatives of the chamber of commerce

Contents: The seminar gives a theoretical input about innovation management as well as the main topic of the actual innovation contest of the chamber of crafts „Demographic change – chances for craft enterprises“. Parallel the students are asked to develop innovative ideas for already existing craft enterprise or to develop an idea for a craft start-up. These ideas are further planned in detail and at the end of the semester presented in front of a jury consisting of academic staff as well as members of the chamber of crafts.

Methods: Theoretical input, group work, coaching, and elevator pitch

Locations and timing: The seminar takes place in seminar rooms at the campus within one semester. It takes place every week in a 90-minute slot

Informal evaluation of learning outcomes and feedback for students: After the presentation students get feedback from the teachers and the jury members, and get the opportunity to reflect upon their performance.

Formal evaluation: Report about the development of an idea.

12.2.4. Setting of entrepreneurship teaching

Locations and timing

Entrepreneurship teaching takes place in different places. The majority of courses take place in classrooms at the university. The summer school takes place at the Technical University of Hamburg-Harburg in regular classrooms. The entrepreneurship courses take place in the summer as well as in the winter term, and follow the “traditional” slot of 90 minutes. Alternatively, courses are offered as “compact” seminars, with four hours each two weeks, or with four up to eight hours on two or three consecutive days. Students are sometimes invited to use the classrooms for group meetings with individual timing.

See chapter 1.2.3 for detailed descriptions of selected examples.

Formal evaluation of learning outcomes

Despite the existence of substantial information, it was not possible to extract the mechanisms for feedback and adjustment.

From the overall offer there are selected interesting formats, which are described in detail concerning all relevant aspects in the previous section (Examples: *Leuphana Enterprise Academy* and *Start-up counselling*, see chapter 1.2.3).

12.2.5. Instructors: teachers and mentors

Professors, other employees and external lecturers of the university

In the study year 2013–2014, five professors were involved in entrepreneurship education, all of them having entrepreneurship or a German synonym in their denomination. There is one Professor for Business and Innovation Management offering courses (see description in chapter 1.2.3). About ten other members of the academic staff (research assistants at chairs or in the Entrepreneurship Hub) offer entrepreneurship courses. About 15 persons teach as invited lecturers, some of them being entrepreneurs in residence. Nearly all of the full time staff is part of the Faculty of Business and Economics. Offers in other faculties are executed by assistant lecturers.

The staff includes Prof. Dr. Schulte, with the Chair of Start-up Management in the Faculty of Business and Economics; Jun.-Prof. Dr. Jantje Halberstadt with the Chair of Social Entrepreneurship (an assistant professorship), in the Centre of Sustainability Management within the Faculty of Sustainability; Prof. Dr. Pez in the Faculty of Humanities and Social Sciences; and Prof. Dr. Fischer in the Faculty of Education. They work as mentors and assess students concerning the choice of educational offers which fit best to their personal and professional career goals.

“Real entrepreneurs” as teachers

Some members of the hired staff work in parallel to their own companies or as freelancers. The involvement of entrepreneurs is a responsibility of each teacher and is not centrally managed.

Mentors

The Entrepreneurship Hub consists of, among other things, the Career Service. Together with the study counsellors, staff from the Hub try to assist students to organize their studies and to follow a successful and self-determined career. A holistic approach for such a self-determined and entrepreneurial career management is currently developed and will integrate all counsellors and mentors at the Leuphana.

There are also professors in each faculty who work as mentors for entrepreneurship. They help to spread information from the Entrepreneurship Hub within their faculties and convey it back into the Hub. This also allows identifying possible entrepreneurs and start-up ideas very early and to offer help and guidance.

Additionally, there is a small “start-up café” that also functions as a co-working space and event location. A community of start-ups gets in contact with nascent entrepreneurs and mentors them. For example, a regular workshop format called „Entrepreneurship in Action” is offered; in

the workshop successful alumni entrepreneurs from the Leuphana teach the start-ups and venture projects about a specific topic that they consider to be critical for becoming a successful start-up. Finally, there is a lecture in the Master of Management and Entrepreneurship degree programme in which the students have to write a business plan for their own idea and where they are asked to find a mentor for from regional SMEs.

12.2.6. Management of entrepreneurship education

The management tasks of entrepreneurship education often interact with the management activities concerning the direct support of start-ups.

Teacher and trainer management

As several interviewees point out it is difficult to systematically develop of academic staff in entrepreneurship education due to the fact that the involved personnel are financed by third party funds of a fixed duration. There is no official Train-the-Trainer programme. Staff is not encouraged to participate in entrepreneurship educator seminars elsewhere.

Entrepreneurs in residence are regularly integrated in lectures and seminars as guest speakers if the topic fits in the course of the seminar.

At the beginning of each semester lecturers are contacted and asked if they are interested in enriching their lectures or seminars with entrepreneurship content and to work together with the Entrepreneurship Hub.

Informal exchange about entrepreneurship education is organised via the Entrepreneurship Hub. A regular round table is planned for 2015. The Entrepreneurship Hub's staff, which is responsible for entrepreneurship education, is part of several national and international networks for entrepreneurship education like the „Denkfabrik“ (organisation of all EXIST universities in Germany) „coneeect“ or the ECSB (3E).

Entrepreneurship activities are not rewarded in a special way but for professors it is possible to get a “free semester” for creating their own start-up. The whole performance measurement and rewarding system of the university is currently under revision and entrepreneurship should have a more prominent role in the upcoming version.

Managing student support

Students who get interested in entrepreneurship during curricular offers and who develop promising business models are offered participation in extra-curricular courses and other start-up supporting measures.

The Entrepreneurship Hub embraces the Career Service. According to statements by interviewees, these institutions are currently developing a competence ascertainment procedure based on KODE®²²². The Entrepreneurship Hub co-operates with the student advisory office and the mentors who are aiming to offer continuous coaching concerning the theme, “being an entrepreneur of one's own live”. To do this, students are provided with a “compass of competences”. This compass of competences helps students to identify important stake-holders for their future study and career planning as well as the appropriate curricular and extra-curricular offers. To identify the appropriate offers, these courses are labelled with KODE competence-areas. As interviewees point out, these support measures will be further developed co-operating with the project “Leuphana auf dem Weg” (Leuphana on the Way), the latter dedicated to the quality management and improvement of teaching. New didactical-methodical approaches shall be developed.

If the students have decided not act as intrapreneur but as entrepreneur and therefore to create their own start-up, members of the Entrepreneurship Hub will support them with coaching and consulting, customized workshops for developing their own idea, business modelling, and marketing. Besides this, the Entrepreneurship Hub offers free infrastructure (5 rooms on the campus near the Entrepreneurship Hub, internet and other facilities), and networking with relevant players like international incubators, VC or business angels.

²²² KODE® is the abbreviation of diagnosis and development of competences. It is a procedure that directly measures competences using different tools to diagnose competences. It was first developed by Prof. Dr. John Erpenbeck, Prof. Dr. Volker Heyse and Dr. Horst Max and is constantly further developed.

Internal and external network management

The co-operation about entrepreneurship education within the university is the responsibility of the Entrepreneurship Hub. The alumni organisation of the Leuphana is not systematically involved in the network management of entrepreneurship education. In given cases, entrepreneurship graduates are involved in entrepreneurship education as assistant lecturers.

One example is a regular workshop format „entrepreneurship in action“. It is offered by successful alumni entrepreneurs from t Leuphana, who teach the upcoming start-ups one special topic that they think is absolutely necessary to become a successful startup. But there are also other SMEs and organizations involved in entrepreneurship education e.g. „Wissensfabrik für Deutschland e.V. (The Knowledge Factory), which is an organization consisting of more than 200 German companies who try to foster entrepreneurial thinking by offering entrepreneurship education formats; the Chamber of Commerce Lüneburg and; Gründungsnetzwerk (Start-up Network) Lüneburg, etc.

Management of curricular integration and attracting new groups of students

Entrepreneurship courses are integrated in several study programmes.

In the *Bachelor study programmes* this is guaranteed through so-called “complementary studies”, which are an integral part of all the study programmes and comprises entrepreneurship offers that students can choose from. In Bachelor programmes, Leuphana offers majors with the possibility to choose entrepreneurship courses in Environmental and Sustainability Studies, Individual Studies, Business Administration, Environmental Sciences, Business Information Systems, Digital Media, Economics and; minors with the possibility to choose entrepreneurship courses in Business Administration, E-Business, Production Engineering, Digital Media/Information Technology & Culture, Social Media and Information Systems.

Entrepreneurship courses get ECTS credits in the following *Master study programmes*: Management & Business Development (M.A.), Management & Controlling/Information Systems (M.A.), Management & Engineering (M.Sc.), Management & Financial Institutions (M.A.), Management & Human Resources (M.A.), Management & Marketing (M.A.) as well as in Sustainability Science (M-Sc.), a Master programme of the area “Arts & Sciences”. In the area of professional Master programmes, entrepreneurship courses get credits in Manufacturing Management/Industrial Management (MBA), Sustainability Management (MBA), Performance Management (MBA) and Social Management (MSM).

In the area of Education, Entrepreneurship Education gets credits in the Master of Education in the area of vocational training.

Entrepreneurship as for-credit-courses in the area of master programmes is mostly limited to business and economic related study programmes.

Finally, entrepreneurship courses are also integrated in the extra-occupational certificate courses of the professional school, namely in the study programme Innovation Management (further education).

Evaluation of courses and programmes

For the course assessment by students the Leuphana uses a standardized tool, called EvaSys. These questionnaires are also used in entrepreneurship related courses. It is in the individual responsibility of each instructor to evaluate the outcomes of the courses.

The staff of the Entrepreneurship Hub is responsible for the adjustment of the overall strategy in co-operation with the Vice President, Professor Dr. Burkhardt Funk. Furthermore, there are co-ordination meetings consisting of the entrepreneurship professors and the associated professors from other subjects, such as business information technology, innovation management, strategic management, or statistics.

Management of continuous education

The Entrepreneurship Hub has developed a MOOC (Massive Open Online Course) in entrepreneurship education in co-operation with Deutsche Telekom.²²³ The platform is

²²³ See <http://digital.leuphana.com/corporate/magenta-mooc/>, last access 11/12/14.

established and operated within the new Digital School. In the project, the Entrepreneurship Hub developed the educational concept for the MOOC, in particular the development of learning objectives, of contents, and assignments, as well as the creation of videos about international issues (with short expert presentations). Mentors give feedback to participants about assignments at the end of each module.

Bigger events like the regular “Night of the Startups” or the lecture series “Spirit of Entrepreneurship” with successful entrepreneurs are not just organized to raise awareness for entrepreneurship but also to integrate alumni in entrepreneurship activities and to make employees and students to think about starting a business.

The Entrepreneurship Hub also organizes workshops with regional SMEs to create new business ideas and innovations and to raise awareness for intrapreneurship in the SMEs.

For start-up coaches, Professor Dr. Schulte together with some colleagues from the Bundesqualitätszirkel Gründungsberatung e.V.²²⁴ (Federal Quality Group Start-up Counselling) developed a special extra-curricular study offer to become a certified start-up coach.

12.3. Extra-curricular activities related to entrepreneurship education

12.3.1. Overview of extra-curricular entrepreneurship activities

The Leuphana have a broad range of different extracurricular offers of the study period summer 2013 and winter 2013 – 2014 as demonstrated in the following exhibit. The list was completed by the staff of the Entrepreneurship Hub. There were no further materials available. The category “objectives” is often interpreted as short description of the content. The study team tried to re-interpret the objectives. The activities take place in German.²²⁵

Similar to the curricular offers, despite the existence of substantial information, it was not possible to extract a canon of expected outcomes from the different extra-curricular offers, such as specific entrepreneurship related competences. The same is true for the categories “contents”, “methods and media”, “informal evaluation of learning outcomes and feedback for students” and “using results of entrepreneurship research”.

From the overall offers, selected interesting formats will be described shortly concerning all aspects mentioned above, in the following. The descriptions also take into account the aspects described in chapter 1.3.4.

Exhibit 12-2: Overview of extra-curricular EE activities at the Leuphana

No.	Name	Objectives	Target group	No. of participants in 2013
1	Student2startup, initiative of Wissensfabrik (https://www.wissensfabrik-deutschland.de/portal/fep/de/dt.jsp?setCursor=1_443753)	Foster entrepreneurial activities in students by student counselling of start-up projects	Students	15-20
2	Contact & Cooperation (C&C)	Student consultancy	Students	About 30
3	Lüneburger Student Consulting e.V.(LSC) (www.lsc-lueneburg.de/)	Student consultancy: Students apply basic principles of business administration, such as business development und strategy, marketing.	Students	8-20
4	Oikos (Green economy)	Sustainable Economy and Entrepreneurship Initiative (Oikos)	Students	About 10

²²⁴ See <http://www.bqz-ev.de/>.

²²⁵ Titles mostly translated by the case study researcher.

No.	Name	Objectives	Target group	No. of participants in 2013
		initially started with a more obvious focus on entrepreneurship but in recent years tends to deal more on subjects which concern society in general.)		
5	Sneep Team (Economic ethics)	Students deal with the challenges of economic and business administration against the background of social responsibility.	Students	8-15
6	ENACTUS	Students create, design and implement social entrepreneurship projects.	Students (university advisor comes from the chair of entrepreneurship or the entrepreneurship Hub)	
7	Summer School in co-operation with TUTECH (Technology Transfer for Technical University of Hamburg-Harburg (five days)	Combining theory and practice of entrepreneurship. After a theoretical introduction, participants develop their business model with support of the academic staff.	Academic staff, especially research associates, students from all universities and universities of applied sciences in the region of Hamburg and Lüneburg,	20 per year (+/- 2)
8	Leuphana Enterprise Academy	Further education programme for people with interest in entrepreneurship and start ups	Academic staff, students, interested persons from the region	About 50
9	SCHub Feedback	Counselling of social entrepreneurship initiatives at Leuphana by external experts	Social entrepreneurship initiatives at Leuphana and other social businesses	About 20
10	SCHub Lectures	Lectures series tackling different aspects of social entrepreneurship	All Students of all faculties and interested external audience	About 100
11	SCHub Camp	Two-days intensive training for social businesses	Social Entrepreneurship initiatives und social businesses at Leuphana	About 25
12	The Spirit of Entrepreneurship	Lecture series with successful entrepreneurs	Anyone interested in the topic	About 700
13	Entrepreneurship in action	Successful entrepreneurs of the region train young entrepreneurs about a specific topic	Students/staff etc of Leuphana with interest in entrepreneurship, nascent entrepreneurs, start-ups of Leuphana	About 40
14	Think Tank	Creative workshop series to develop business ideas	Research groups of Leuphana, companies, students	About 30
15	Regular round tables for entrepreneurs "Gründerstammtisch"	Monthly event aiming at networking and sharing of information for young entrepreneurs	Leuphana start-ups, anyone interested in entrepreneurship from the region, interested students and	About 120

No.	Name	Objectives	Target group	No. of participants in 2013
			members of the academic staff	
16	Leuphana pitch competition	Open elevator pitch competition during the Leuphana conference on entrepreneurship	Students, academic staff	20 - 30
17	Leuphana business idea of the year	Business idea competition	Students, academic staff	About 30
18	Magenta MOOC ("Discover your entrepreneurial Spirit")	Massive Open Online Course for Deutsche Telekom	Members of Deutsche Telekom worldwide	About 2500

12.3.2. Target groups of extra-curricular activities

The university's target groups of extra-curricular entrepreneurship education activities are similar to the target groups described in 1.2.2. As said by interviewees, extra-curricular activities have a double function: at the beginning of the entrepreneurship education career, the offers raise awareness in students for entrepreneurial thinking and behaviour and a possible professional career as an entrepreneur. After having passed curricular offers, students with a high interest in entrepreneurship or nascent entrepreneurs again take extra-curricular offers with a specific focus on start-ups.

The offers are not targeted to specific departments or faculties but are intended to offer a mixture that attracts students, employees etc. from all faculties, e.g. by inviting successful entrepreneurs for workshops not only from the field of internet start-ups but also social businesses, education or eco-businesses.

12.3.3. Designing extra-curricular activities

Intentions

For the overall *objectives* of entrepreneurship teaching see chapter 1.2.3.

Despite the existence of substantial information, it was not possible to extract a canon of expected outcomes from the different extra-curricular offers, such as specific entrepreneurship related competences. The same is true for the categories of "contents", "methods and media", "informal evaluation of learning outcomes and feedback for students" and "using results of entrepreneurship research".

From the overall offers, selected interesting formats will be described shortly concerning all aspects mentioned above, in the following. The descriptions also take into account the aspects described in chapter 1.2.4.

Student2Start-up

Target group: Students from all faculties

Teacher: Employed academic staff from the university, team-teaching with two teachers.

Objectives: The students autonomously plan and elaborate a consulting project with their clients and get an insight into the workings of a young start-up.

Contents: Student teams of 5 – 8 members solve problems of start-ups at the early start-up-phase. The student teams have 6 weeks to get in contact with the start-up, identify and discuss

a problem that can be solved in that time frame, and then present their findings in front of the founders in a plenary session.

Methods and Media: In the opening meeting, the students have to choose a business case. In the final session, 6 weeks after the beginning of the activity, they present their findings via PowerPoint presentation in front of the founders.

Informal evaluation of learning outcomes and feedback for students: The Entrepreneurship Hub's staff guides them through the process and is in constant communication with the team throughout the 6 weeks. However, the teams have to solve the problems by themselves.

Locations and timing: Student2Start-up takes place in seminar rooms at the campus within one semester. It consists of three meetings in person. One opening session, one session after three weeks, and a final plenary session.

Formal evaluation and learning outcomes: Participants have to develop a rich and insightful presentation and a report for their clients.

Spirit of Entrepreneurship

Target group Open for everyone at Leuphana.

Teacher: External Speakers.

Contents: Highly acclaimed entrepreneurs from different fields and backgrounds talk about their entrepreneurial story and answer questions by the students.

Methods and Media: The speakers bring their own set of slides for their talks.

Informal evaluation of learning outcomes and feedback for students: Students may ask questions about details and insight of the entrepreneurial endeavour of the guest speaker.

Locations and timing: At least three times per semester in the afternoon, so that as many students as possible can join the discussion.

Formal evaluation and learning outcomes: None.

12.3.4. Setting of extra-curricular activities

Locations

The locations depend on the number of participants and the aim of the activities. They take place in seminar-rooms, lectures halls all over the university, sometimes even in the Mensa, but also inside regional SMEs and the campus based start-up cafe and co-working space "Die Lokalität" (The Locality). The Entrepreneurship Hub provides special rooms with office equipment, called pre-incubators, to start-up teams. The teams meet there during the idea generation and seed phase and receive readily available mentoring.

Timing

Extra-curricular activities are offered at similar times like curricular offers. Big events like the "Night of the Start-ups" are of course taking place during the evening. Other events like the "Leuphana Elevator Pitch Contest" take place during the whole day. Some offers like "Student2Startup" last six weeks (kick-off workshop, six weeks counselling start-ups, presentation workshop). Others like the Leuphana Enterprise Academy are clustered (8 workshops clustered over 4 weekends) and some workshops last only some hours or two days.

12.3.5. Persons involved in extra-curricular activities

External experts are involved in most extra-curricular activities. The Entrepreneurship Hub designs specific formats and guides them through with the help of external experts. The "Spirit of Entrepreneurship" for example, is a teaching format that consists mostly of entrepreneurs from different fields to match the main faculties of Leuphana. Every semester at least three

highly successful entrepreneurs get in contact with the students to talk about their own story and to answer questions the students might have. Students and staff can come to these lectures and get first hand insight about the entrepreneurial process. Another format is "Entrepreneurship in Action", where successful entrepreneurs of the region train young entrepreneurs about a specific topic. These events are guided by staff of the Entrepreneurship Hub and students have to register themselves upfront for the limited capacity events.

12.3.6. Management of extra-curricular activities

All extra-curricular activities are managed and coordinated by the Entrepreneurship Hub in close collaboration with the other departments and staff at Leuphana. A dedicated staff member of the Entrepreneurship Hub is in charge of the implementation of current and new formats. Before the Entrepreneurship Hub was deployed, extra-curricular activities were plenty, but unstructured. Now, students can find all the different activities and events on the homepage of the Entrepreneurship Hub and can suggest new formats to be included.

Managing student support

See the same section in the chapter of curricular activities, chapter 1.2.6.

Management of possible integration of extra-curricular elements and attracting new groups of students

To attract students for entrepreneurship related issues, the responsible member of the staff of the Entrepreneurship Hub uses all existing means, such as print media (posters flyers); internet based media, such as the websites of the Entrepreneurship Hub; if indicated, the platform Mystudy and; social media, such as Twitter and Facebook. The staff agreed upon attracting students and other groups by offering interesting activities, such as a lecture series with successful entrepreneurs from all over Europe, and frequently from the next big city, Hamburg. Staff also presents the extracurricular offers in selected lectures having a network of engaged and interested full tenured professors.

The already mentioned "co-working space" (see chapter 1.2.5) is located centrally on the campus in an area called "campus-line" and is highly visible for all students. It is financially supported by the university by a favourable rent and is run by young entrepreneurs. Alongside their work, they offer a part of the location for the ignition phase of ideas of other students and also as a (teaching) event location. It is a location with big windows and students immediately get in contact with interested people in entrepreneurship without any barriers. Thus the Entrepreneurship Hub can easily develop offers close to the needs of the students and at the same time, have a positive marketing effect.

12.4. Institutional aspects of entrepreneurship education

12.4.1. Organisational set-up and change

Measures for coordinating and integrating entrepreneurship education across the university

The fusion of the University of Lüneburg and the University of Applied Sciences North-East-Lower-Saxony in 2005 presented a new start which was used to create novel structures and a new profile. As the focus on entrepreneurship was only a part of the process, internal resistance to the topic could be warded off or even avoided right from the beginning. It was much easier than if confronted with the changing of deeply anchored structures and an established profile. Still existing resistance is countered by the "Humboldt-Schumpeter" approach which has the power to debilitate common resentments like "Economisation of the University". Nonetheless, it remains a line of conflict at Leuphana, in particular when discussed with long-time professors of the non-economic faculties and student committees.

It is necessary to make the "integrative contents of entrepreneurship" a subject of intensive discussion, since among these groups there remains an apprehension of an interference of the freedom of research and academic teaching.

Influence of external stakeholders in the entrepreneurship education programmes

The topic of entrepreneurship was and still is unproblematic among external stakeholders. Rather, general ignorance about the university's work as well as scepticism towards the overall new orientation form relevant difficulties. Thanks to an intensive cooperation between the university, KMU and regional stakeholders in the context of the EU Innovation Incubator it was possible to reduce these over the past four years.

12.4.2. Laws, statutes and codes

Incentives for staff to engage in or support entrepreneurship education

Currently, university staff can take an entrepreneurial sabbatical to focus on starting a new venture. There is no record on how many researchers and research assistants have chosen to take advantage of this arrangement. Other remunerations are not in place. Nonetheless, the Chair of (which department?) the University is working on a new university-wide guideline for incentives regarding entrepreneurial activity as well as support for students who are trying to launch entrepreneurial activities in their respective faculties. This process has just started and is going to take 1-2 years to implement due to complex financial ties to government funding.

12.4.3. Mindsets and attitudes

The University sees itself as a humanistic sustainable and proactive university which fosters the development of responsible and proactive individuals who are able to turn ideas into action, to govern their own lives in an entrepreneurial way and to creatively shape society for a better future. This is why Leuphana is going to strengthen its image and portfolio in relation to the "Humboldt plus Schumpeter" approach. Therefore, as interviewees told, entrepreneurship will be understood in a broad sense. In terms of "Humboldt plus Schumpeter", entrepreneurship is a comprehensive form of modern lifestyle which refers to "an individual's ability to turn ideas into action. It includes creativity, innovation and risk taking, as well as the ability to plan and manage projects in order to achieve objectives. This supports everyone in day to day life at home and in society, employees in being aware of the context of their work and being able to seize opportunities..." (EU Kommission 2007: 11). So Leuphana members see entrepreneurship as another kind of educational ideal originating from Humboldt. Because of this broad view of entrepreneurship, the university tries to implement entrepreneurship content in all faculties, studies and at all organizational levels. Therefore, their activities are understood as part of entrepreneurship education, especially due to orientation and support offers to students to realize their own ideas. Existing seminar content gets enriched with entrepreneurship or intrapreneurship related content, curricular and extracurricular activities as well as entrepreneurship education, relevant players are becoming coordinated throughout the university (macro-didactical approach with a mixture of classical and action oriented teaching formats), these players are also becoming coordinated with all other relevant players like coaches and finally all activities getting integrated in an overall strategy. This holistic approach is theoretically based on the work of PD Dr. Mark Euler, 2014, who is a member of the Management Board of the Entrepreneurship Hub.

As interviewees pointed out, in order to raise awareness for this kind of understanding entrepreneurship seminars focused on entrepreneurship like "Start-up Management" are as important as those lectures that became enriched with entrepreneurship content e.g. a historical seminar about the medieval life that also shows how entrepreneurs became important for the changes that led to modern society. Besides these kinds of entrepreneurship education activities, big events like the "Freshmen Week" or the "Night of the Start-ups" are also important to raise awareness and to offer different perspectives on entrepreneurship. The entrepreneurship educators understand themselves as suppliers of "knowledge services" that may help students, employees and SME to realize their ideas and live a successful entrepreneurial life as pointed out by interviewees. That's why they also have to promote their offers using marketing activities like social media, guerrilla marketing activities e.g. giving ice cream for free to those who hand in a start-up idea at the information desk, art exhibition with portraits pictures of successful alumni entrepreneurs etc.

As a result of all these activities, Leuphana University is always ranked as one of the top-ten universities for entrepreneurship in the most important German ranking „Vom Studenten zum Unternehmer“ (From Student to Entrepreneur“). In 2005, Leuphana was ranked number one.

Students with the career goal of teacher for secondary schools in the area of vocational training underline the importance of having entrepreneurial competences on their own. They are of the opinion that having experienced entrepreneurial thinking and behaviour help to be better teachers, having a closer link to the job reality. Reflecting on a school internship, one of the interviewed students said that students at high schools and vocational schools are often not interested in the subject of entrepreneurship and seem to be overburdened. Future teachers need to learn to be very patient and to know about innovative methodical approaches to attract students' interest in the topic.

12.5. External relationships related to entrepreneurship education

12.5.1. External stakeholders involved in entrepreneurship education

During the last four years, over 500 projects were carried out in co-operation between regional companies and the Leuphana. Frequently these projects consist of master theses in the area of R&D supported by the respective professors at Leuphana. Financial Institutions are not involved in entrepreneurship education but sponsor the Freshmen Week. The Leuphana interacts with business support services, particularly with the Chamber of Commerce in the lecture and seminar "Management of Innovation" (see detailed description in chapter 1.2.3).

The Entrepreneurship Hub is in close contact to the Lüneburg Science Park "E-Novum". Sometimes workshops take place here and teams from the Leuphana have their offices there. Also an intense knowledge exchange happens with the incubator "Plug and Play" (Axel-Springer AG) and "Hubraum" (Telekom).

12.5.2. International relationships

The Entrepreneurship Hub has a strong network with international partners. There is a strong relationship to the ECSB and every year a research conference is held at Leuphana. In 2015, the European Entrepreneurship Education Conference 3E (hosted by the ECSB) will take place in Lüneburg. Therefore, the team holds strong ties to various network partners (universities) of the ECSB. One member of the Entrepreneurship Hub is also member of the board of the ECSB. Regarding combined efforts in entrepreneurship education, the Entrepreneurship Hub has established a network with the University of East London and the University of Florida, whilst planning a joint event and training for students on all three locations at once. There are also strong ties to the Glasgow Rangers Football Club, with whom the Leuphana Entrepreneurship Hub organizes joint courses, with a focus on business incubators. Moreover, some of the staff is part of the Coneect Network, an international network that offers training courses for academic entrepreneurship teachers in Europe.

The Chair for Social Entrepreneurship is also closely connected to universities in South Africa.

The Student Training for Entrepreneurial Promotion (STEP) programme, located at the chair of Professor Dr. Frese fosters strong relationships with Kenya, Tanzania, Rwanda, Liberia, Mexico, Philippines, Uganda, Togo and Lesotho. The researches and staff of the Institute of Corporate Development implement entrepreneurship trainings which cover different topics, such as "Opportunity Identification", "Management of Finances", and "Personal Initiative". From the domain of entrepreneurship, the topics include "Business Administration" and "Psychology". The findings of the highly acclaimed research endeavours with a focus on action-oriented trainings can then be transferred into the curricula of Leuphana University.

12.6. Impact measurement and lessons learned

12.6.1. Evaluating impacts of the entrepreneurship education approach

The University of Lüneburg is currently setting up a quality management system for all activities related to starting a business and for entrepreneurship education. This also applies to impact analysis. Both systems are part of the currently running project within the EXIST IV support programme of the federal government.

12.6.2. Lessons learned

Summary of lessons learned from this case

It is very important to get as many students as possible in contact with the theme of entrepreneurial thinking and behaviour. This can be done by compulsory curricular offers, such as the "Leuphana Week", as well as through a broad offer of entrepreneurship related courses in compulsory studies. This also can be done by integrating the theme of entrepreneurship, innovation and social responsibility in as many courses as possible.

Interviewees point out that the extracurricular elements serve to raise awareness for entrepreneurial thinking and behaviour. They open the mind of students for the corresponding offers, for example in Complementary Studies. After having raised awareness, extracurricular activities directly support nascent entrepreneurs with offers such as "SCHUB Camp", the regular "Round Tables for Entrepreneurs" and "ENACTUS".

A varied study programme is basically welcome but it is not desirable per se to have a wide range of offers. Curricular and extra-curricular offers should rather be meaningfully interlinked. A sound theoretical academic programme has to be systematically accompanied by practical courses, seminars and training.

Leuphana aims to raise awareness for entrepreneurship among students and sensitising the importance of idea generation for students, either by creating something completely new or by using and combining what is already there.

As to the reputation of an "Entrepreneurship University", external communication is indispensable, consisting of good results in university rankings, research output and an increased presence on scientific conferences. This visibility and reputation leads to an increased interest of students in entrepreneurship related study programmes, such as the Master of Management and Entrepreneurship, with a specialisation in Business Development.

For the sake of an efficient entrepreneurship education programme, it is necessary to adapt to the educational needs of students from different target groups. The study programme has to be developed and adapted to these specific target groups, such as the "Start Week" for students who do not have any knowledge about entrepreneurship; offers for the target group of students from Business Management with a more academic focus and; offers for the target group of students who are interested in start-ups. In the latter group, it can also be useful to differentiate between the phase of idea generation, the phase of comprehensive competences and the phase of nascent entrepreneurs. Offers for this target group would be mostly extra-curricular.

The current generation of students differs from the last generation in several aspects: They are more mobile, observing other universities and comparing them to their own university. They are open minded and self-confident, with interest in new topics. On the other hand, they do not like to focus too much on one theme and do not accept compulsory presence in classes. This is why interviewees point out the importance of innovative approaches in the curricular offers (reducing traditional lectures, changing to formats with more self-centred learning etc.). But nonetheless, entrepreneurship education should employ a broad variety of different methods, from experiential learning to the more traditional elements of learning.

As interviewees, especially those who pursued an entrepreneurial career after graduation, point out that the learning outcomes of entrepreneurship education were nearly up to 100% of practical use. The close link between university and industry is essential to develop entrepreneurial skills. Direct contact with real entrepreneurs, business plan and idea competitions helped a lot. Entrepreneurship education resulted in giving better access to the more theoretical issues of economics and business administration.

External communication is important as to make visible the entrepreneurship education efforts and outcomes. This can be done by good positions in rankings, a good research output as well as (international) conferences. That leads to an increased demand e.g. for the study programme Master of Management and Entrepreneurship.

The large amount of third-party projects has advantages and disadvantages. On one hand, having a large number of third-party funded projects allows offering a broad range of activities. On the other hand, above all, the stakeholders in third-party funded projects have to achieve the objectives as indicated in their proposals. This is at the expense of the comprehensive

structure for entrepreneurship education in the entire university and even in smaller units. As a vision for the future, the Board of Management aims to combine and organize different elements more effectively and converging the didactic quality. This should be done by developing a "Didactic Leuphana Approach" to foster entrepreneurial thinking and behaviour within the scope of a follow-up application.

Transferability to other universities

Due to the fact that the broad approach is a competence or education-related approach, it can be transferred to all universities. Depending on the university's profile, tailoring specific contents to the target group would be required. This would imply a much more practical, hands-on, but somewhat more difficult approach for technical universities, compared to universities that are oriented towards humanities. The same holds for the methodology. A mix of classical, instructive and more current action-oriented methods can generally be applied to all universities. So can the intended macro didactical coordination of all offers and all actors involved. However, this realisation is more difficult in bigger and established universities than in smaller and newer universities.

It is the university management's endeavour and claim to educate and form autonomous personalities who will shape the society of the 21st century in a responsible way. That would imply thinking of economy in new and sustainable terms and consequently viewing entrepreneurs not as "homines oeconomici" but "homines interagens", i.e. persons who are capable of developing their own goals and – in an effort of exchange these with others – of realising these in a sustainable and responsible way. It is the explicit wish to transfer this vision and to realise it to corresponding contents and methods, hence an exchange with other universities is actively supported. Therefore, a competence-oriented approach of entrepreneurship and the departure from focusing exclusively on the research on, and support of, profit-oriented innovative start-ups is central.

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Annex

Comprehensive overview about curricular EE offers at the Leuphana University, Lüneburg:

No.	Name	Objectives	Target group	No. of participants in [year]
1	Orientation Week	The Leuphana Freshmen Week is an integral part of the Leuphana University's new model of studies, which has received much attention along with multiple distinctions. Since 2007, this special opening has given the students the opportunity for a collective start into their studies. Besides the general introductions, in which they are familiarized with the University and their field of studies, every year is dominated by the development of a practical project. The Orientation Week 2012 was held with the slogan "Start UP!". It hosted for the first time, the Leuphana Europe-wide unique start-up competition, with the theme that every year a social problem would be solved with the help of a start-up idea.	Students of first year	1800
2	Summer School in co-operation with TUTECH (Technology Transfer for Technical University of Hamburg-Harburg)	At the Summer School, an intense discussion is held on the theme of "Start-up Planning". The event takes place in a motivating environment for entrepreneurs, the hit Technopark. Students can interact with, and learn from the staff of the Technopark, including student entrepreneurs who work there, founders, as well as their contacts. This has practical experience for students. The aim is to provide students with the tools and the network for successful start-up creation.	Academic staff, especially (senior researcher), students from all universities and universities of applied sciences in the region of Hamburg and Lüneburg, (with credits for students in the area of complementary	20

No.	Name	Objectives	Target group	No. of participants in [year]
			studies) (also extracurricular)	
3	Create Bags for Starters – Act Entrepreneurial to the Benefit of the Freshmen	Students develop a real entrepreneurial project with a given product, such as product development, financing, fundraising and sponsorship, sustainability	Bachelor Students of all faculties in the area of complementary studies	25
4	Civil Law for Business	Introduction to general civil law, in particular, contract law and; the law of obligations, in particular, the right to rescind.	Students of the faculty of Business and Economics	150
5	Managing Entrepreneurial Opportunities (Seminar)	<p>Joseph Schumpeter’s assertion that entrepreneurs are the engines of innovation, growth and renewal has inspired academics to unravel how enterprising individuals develop ideas into successful corporations. Turning opportunity into value creating business is the essence of entrepreneurship. Hence, this core module focuses on the spotting and acting on business opportunities. Entrepreneurs do not only to spot opportunities they also must mobilize resources that are needed to milk the opportunity. Usually, considerable time and energy is spent on developing the value proposition and on building the organization. Of course, it does not stop there as many entrepreneurs seek to grow their business.</p> <p>This module provides a bird’s eye view on the success and fail factors of such business venturing. Not to provide recipes for success, but to introduce you to the most relevant lessons that can be drawn from the sociological, psychological and economic studies of entrepreneurship and from the interdisciplinary contributions from management and business studies. This approach reflects the profound interdisciplinary nature of entrepreneurship as a field. It also shows how academic research can be used to inform and improve entrepreneurial practice.</p>	Students of Business and Economics	30
6	Entrepreneurial Responsibility	The students will be introduced to the field of corporate social responsibility and given an overview of relevant concepts (e.g., definitions, instruments such as sustainability report and stakeholder dialogue) and their practical implementation in a company. Students will learn and reflect on a range of issues and the scope of corporate social responsibility. Students will receive know-how relevant to economic, social and environmental responsibility, as well as communication. They will also receive material in the form of case studies and sustainability reports. They will be assessed on individual and group presentations on a chosen topic.	“Leuphana Semester” Students of all faculties in the first study term (freshman courses)	27
7	Sustainable Entrepreneurship (seminar/exercises)	Students will learn the basics of management of business start-ups and be able to apply them in practice. The students should be able to name examples, as well as the specifics, of sustainable entrepreneurship and be able to transfer aspects	Students, all, freshman	35

No.	Name	Objectives	Target group	No. of participants in [year]
		of sustainable entrepreneurship to their own start-up projects. In addition, students will learn about "Sustainable Intrapreneurship", the innovative, sustainable activities of large companies		
9	Entrepreneurship and International Business (EN)	International trade and small-medium scale enterprises (SMEs) form the backbone of the German economy. Through this seminar, students will learn about the rudiments of setting up and operating SMEs. SMEs are also active in international business and students are prepared here to confront the challenges of going global. Topics include Entrepreneurship - its risks and glories; the status of SMEs in Germany; legal requirements to set up an SME, Success Stories of Start-ups; Marketing Techniques; Role of the World Trade Organization (WTO) and Special Services like Agency Arrangements and Forwarding cum Shipping Terms.	BA students, all, complementary	20
10	Entrepreneurship – Economic and Empirical Analysis of Start-ups (lecture)	"New" economic activities of existing companies, as well as start-ups include the elemental components of economic development. The questions, such as what causes such activities, factors affecting their success and contribution to the dynamics of development of economies, are studied from an economic perspective. In addition, aspects of re-distribution will be addressed by these new economic activities. The lecture explores these approaches from an economics and business administration point of view.	Students of Business and Economics	25
10	Managing Start-ups (seminar)	See detailed description in chapter 1.2.3	Students of Business and Economics	30
11	Principles of Business Administration Based on Entrepreneurship (lecture) (in summer and winter semester)	Fundamentals and basic concepts of decision-oriented economics <ul style="list-style-type: none"> - Quantitative analysis and controlling and managing businesses - Start-ups - Goal oriented management of companies - Fundamentals of decision theory - Optimization under scarcity 	Students of Business and Economics	650
12	Principles of Business Management: A start-up orientated introduction (exercises) (in summer and winter semester)	See above	Students of Business and Economics	650
13	Start-up Management (lecture)	The course deals with the process of the formation and early development of enterprises, studied from a business perspective and pays special attention to the case of business start-ups, i.e. creating an own enterprise or acquiring an existing company. A company is studied from its development process, i.e. a major	Students of Business and Economics	220

No.	Name	Objectives	Target group	No. of participants in [year]
		characteristic of this approach is the idea that a company goes through the phases of birth and growth. Hence, analysis is focused on how this dynamic process takes place.		
14	Start-up Management (accompanying exercise)	See above	Students of Business and Economics	220
15	Corporate Sustainability Communication	<p>Aims of the module are:</p> <p>Learn basic theoretical elements of corporate communications, as well as establishing an understanding of the field through the following:</p> <ul style="list-style-type: none"> - Dealing with different theoretical concepts and reflection on practice - Basic concepts, challenges, concepts and tools of (corporate) communication of sustainability - Reflexivity - Critical approach to theoretical and empirical results - Working as a team - Discussion skills - Ability to work independently - Presentation skills 	Students of the faculty of sustainability	30
16	Basics of Taxation of Entrepreneurial Activities	Understanding corporate tax law and its core structures, the course consists of fundamental knowledge in income, corporate, commercial and tax law, as well as the development of supporting principles for success- and performance-related tax sharing. The students should demonstrate the ability to critically evaluate corporate tax law and study it in the context of start-ups.	Students of Business and Economics	50
17	Social Entrepreneurship in Developing Countries: Supporting Global Sustainability I (seminar)	Independent, result-oriented action for global sustainability through the realization of a micro-project in Latin America and Africa in social entrepreneurship. Acquisition of necessary tools - for example, critical examination of development cooperation and policy; corporate social responsibility with the principles of teamwork, project planning and implementation and fundraising; awareness about a specific issue overseas and its causes and effects; acquisition of social skills in an international-cultural dimension; applying theory to practice and; moving from a unidirectional to a multidirectional perspective on development cooperation.	Leuphana Semester	25
18	Social Entrepreneurship in Developing Countries: Supporting Global Sustainability II (seminar)	See above	Leuphana Semester	25
19	Literature and Money (Tutoring)	Are economics and morality actually terms that should be associated with each other? What is	Leuphana Semester	27

No.	Name	Objectives	Target group	No. of participants in [year]
		economics and entrepreneurship? People have dealt with these issues as long as they have traded and negotiated. This seminar explores the discussion of these questions and the answers that have developed over the past 2,500 years.		
20	Training of Entrepreneurs in Developing Countries (seminar)	This project aims to promote entrepreneurs in developing countries and how they can realize business opportunities and improve their performance in the market. There are good indicators, in our opinion, that entrepreneurship is an important measure of poverty reduction in developing countries. Students interested in this area also have the option to travel to Africa with an existing DAAD programme to write their thesis on a similar project.	Students of Business and Economics	
21	Training of Entrepreneurs in Developing Countries (exercise)	See above	Students of Business and Economics	25
22	The Entrepreneurial Self – an Inventory	The mission of the entrepreneurial self, according Ulrich Bröckling is, "A bundle of interpretive schemes with which people today understand themselves and their modes of existence." The aim of the seminar will be to identify these interpretive schemes based on reading central chapters from Bröcklings book "The Entrepreneurial Self" to discuss and apply them to participants' own everyday experiences.	Leuphana Semester	27
23	Business Planning (exercise)	The session focuses on the development of a business plan and all of its associated planning steps in the business process. All relevant content is taught but students are also given the opportunity to write a sample business plan, which would then be assessed on its quality and content. This didactic approach requires a high degree of readiness for participation by the students. The creation process and its assessment will be traced from the initial brainstorming until its final planning.	Students of Business and Economics	220
24	Development of Vocational Education in the Context of Socio-cultural, Political, Ecological, Technological and Work Organisation Related Changes: Employability and Entrepreneurship (seminar)	Students will acquire an insight into the socio-economic foundations of change processes of modern working environments. Included concepts are "employability", "labour-entrepreneur" and "entrepreneurship and intrapreneurship". The seminar discusses the resulting implications for education and training systems and entrepreneurs, politics and society based on these concepts.	Students of the Faculty of Education (future teachers in vocational training)	35
25	<i>Leuphana Enterprise Academy</i>	See detailed description in chapter 1.2.3.	BA students, all, complementary (see also extra-curricular offers)	20
26	The Newest	This seminar focuses on three objectives: First,	Students of	20

No.	Name	Objectives	Target group	No. of participants in [year]
	Developments in Organisational Behaviour & Entrepreneurship (seminar) (EN)	develop a good set of thoughts on the scientific OB-HR and Entrepreneurship literature; second, understand, how scientific articles are written in this area and how one can participate in this endeavor, and third develop a study design during this course that one might want to perform and to publish at some point.	Business and Economics	
27	The Business Decision of Reorganisation in Practice in the Tension between Collective and Individual Labour Law	Students learn about individual labour law provisions in a case study setting, such as the prerequisites of operational termination and notice of amendment, and the corresponding participation and co-determination rights under the framework of the Works Constitution Act. In addition, aspects and requirements of compensation agreements are also studied in the context of start-ups.	Students of Education	15
28	General Business Management and Start-up Management (Seminar) (in summer and winter semester)	Presentation and discussion of undergraduate work with a focus on business start-ups.	Bachelor Students of Business and Economics	15
29	Start-Up Counselling (seminar)	Students acquire course competencies within the course and learn to apply them to real cases. The following main topics are covered: concepts and forms of counselling; the counselling process; analysis of counselling requirements; consultation design; consultancy content; consultant-entrepreneur communication and business plan analysis.	Students of Business and Economics	18
30	Visionaries, Innovators, Entrepreneurs – Entrepreneurs over the Course of Time	The seminar looks at the essential principles governing sustainable development and entrepreneurial action in an increasingly complex society. Students arrive at this general observation by working in groups and analysing case studies about selected entrepreneurs. This seminar follows a strong, inter-disciplinary approach. Therefore, it enables students to view their own discipline from a different perspective and learn about other disciplines from a common ground. Rather than employing a one-sided teaching approach, the seminar allows for a joint discussion of the study contents. The seminar is very different from traditional courses because parts of the course contents are crafted by the students themselves. The workshop units aim to improve students' personal, social and methodological competences.	BA students, all, complementary	25
31	Social Entrepreneurship	This course examines theoretical and practical aspects of the phenomenon of 'Social Entrepreneurship' and 'Social Business'. The focus is on their development in Germany. The first major section is devoted to the history and nature of the concept of integration in the context of entrepreneurship and social development. The second section is devoted to the practical implementation of social business models and their analysis, methods of impact assessment and, funding and governance issues in social entrepreneurship. Students also have the	Students of Sustainability	40

No.	Name	Objectives	Target group	No. of participants in [year]
		opportunity to develop their own project and prepare a project-idea presentation.		
32	Salt, Power, Culture: The mentality of pre-industrial Entrepreneurs in Lüneburg	Since the second half of the 14th century, the economic and political power of the town of Lüneburg was in the hands of some - a few families - the so-called "Sülfmeister". In the 15th century, they formed an impermeable social class. A key prerequisite for this were resources in the form of saline. This seminar questions the extent to which money, power and morality are related and how this particular entrepreneurial mentality was coined.	Leuphana Semester	27
33	Models of Social Entrepreneurship : TerraCycle as an Example	This project seminar aims to show students the central challenges a socially-oriented company, like TerraCycle, faces. The question of how an ecologically and socially-oriented company is positioned within a capitalist society is answered. Other Issues, such as the daily workflow of TerraCycle, are also analysed.	Leuphana Semester	27
34	Management of Innovation – Project Seminar	See detailed description in chapter 1.2.3.	Master students of Management and Entrepreneurship (2 nd semester)	250
35	Social Entrepreneurship Project Lab – Development and Planning of Your Own Social Entrepreneurial Project (project seminar)	See detailed description in chapter 1.2.3.	BA students, all, complementary	25
36	Cultural Entrepreneurship – AnSCHub conference 2015(project seminar)	To raise awareness for a new research area in social entrepreneurship: cultural entrepreneurship. To get insights in scientific research by developing and writing a scientific paper.	BA students, all, complementary	25
37	Integrative solution of questions concerning business management	Integration of theoretical knowledge in different subjects and practical application by writing a business plan	BA students, compulsory module	25

13. Lund University, Sweden: embedding entrepreneurship in a regional context

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Abstract



Lund University (LU) is located close to a science park in a region with numerous incubators and start-ups in a rather densely populated area. The University uses its strategic location as a source of competitive advantage by strongly collaborating with local established companies, start-ups, student organisations, support services and incubators. The institution with the strongest link to entrepreneurship at LU is the Sten K. Johnson Centre for Entrepreneurship (SKJCE). SKJCE offers a variety of demand driven courses at five of eight faculties of LU, but also undergraduate and graduate programmes where students from different disciplinary backgrounds are admitted. Of particular importance is the Master's Programme in Entrepreneurship (MPE) with two distinct tracks, New Venture Creation (NVC) and Corporate Entrepreneurship and Innovation (CEI). Within this highly competitive MPE a focus is set on action-reflection teaching methods while close connection with companies and support systems in the region is aspired. LU also offers several extra-curricular activities in entrepreneurship education. Examples include awards and scholarships provided to students based on pitched business ideas and entrepreneurship-oriented initiatives such as Venture Lab (a student incubator that inspires and gives business advice), Venture Cup (a business plan competition) and FENA (a student association for entrepreneurship).

Case study fact sheet

▪ Full name of the university and location:	Lund University, Sweden
▪ Legal status	Public University
▪ Location (if applicable: branches):	Campuses are situated in Lund, Malmö, Helsingborg and Ljungbyhed in Sweden
▪ Year of foundation:	1666
▪ Number of students in 2013:	47,700
▪ Number of employees in 2013:	Total employees: 7,540 Professors: 840 Lecturers, researchers and doctoral students: 4,350 Technical and administrative staff: 2,350
▪ Budget in 2013:	Total Revenue in SEK million: 7,475 Direct government funding in SEK million: 4,101 Grants/external revenue in SEK million: 2,413 Other revenue in SEK million: 959 Total Expenditure in SEK million: 7,552 Staff in SEK million: 4,596 Premises in SEK million: 946 Other expenses in SEK million: 2,010
▪ Academic profile:	LU offers one of the broadest ranges of programmes and courses in Scandinavia, based on cross-disciplinary, cutting-edge research. The compact university campus encourages networking as well as scientific breakthroughs and innovations. In terms of its education, LU wants to educate "the knowledge generators, problem solvers and leaders of tomorrow" by teaching students "how to think freely, creatively and critically, and to develop their ability to work across

	<i>disciplinary boundaries and externally to tackle demanding problems”.</i>
▪ <i>Entrepreneurial profile:</i>	<i>At LU, an action-oriented approach is employed for entrepreneurship education. Simultaneously, analytical thinking is fostered and knowledge from contemporary research is deeply embedded into entrepreneurship education. This teaching approach has been themed as “action-reflection”. Connections to companies and support systems in the region are close.</i>
▪ <i>Activities focused in this case study:</i>	<i>Curricular and extra-curricular activities, external relationships related to entrepreneurship education</i>
▪ <i>Case contact person(s):</i>	<i>Prof. Hans Landström, Professor in Entrepreneurship at SKJCE, and Marie Löwegren, Director of SKJCE, SEM, LU</i>

Information included in this case study is from end of year 2014 unless stated differently.

13.1. The university’s entrepreneurship education profile

13.1.1. The university’s overall approach to entrepreneurship education

LU is located in southern Sweden within the Danish-Swedish Öresund region. Sweden is ranked as the most creative country in the world and as the second best country in the world in terms of the provision of its higher education²²⁶. The Öresund region counts 3.8 million inhabitants in Denmark and Sweden, and is regarded as one of the major growth regions in Europe. This region is home to 12 universities, 155,000 students, 12,000 researchers and the highest concentration of highly-qualified workers in northern Europe. It is therefore one of Europe’s most creative hubs for science, innovation and culture. The Lund region itself is the second largest hub in Sweden behind Stockholm. More than 1000 companies are formed in Lund each year out of which a majority represents consultancies. The innovation system in the Lund region encompasses a total of around 50 mostly public and semi-public actors.

LU consists of eight faculties, namely Economics and Management, Engineering, Fine and Performing Arts, Humanities and Theology, Law, Medicine, Science and Social Science. Most of these faculties are located in Lund itself. Further locations of LU include Malmö, Helsingborg and Ljungbyhed. Within Lund, parts of the university are situated close to the IDEON Science Park in Lund (see section 1.5). IDEON Science Park represents one of Scandinavia’s largest science parks and is thus a vibrant, innovative and unique environment for entrepreneurship education. Deep integration and close collaboration between LU and external stakeholders that are based at IDEON Science Park, such as local enterprises, student organisations and incubators can be observed. This creates a strong supporting environment for (student) entrepreneurs.

LU was founded in 1666 and possessed approximately 47,700 students and 7,500 employees in 2013. The University grew strongly throughout the 20th century and is at present one of the oldest and largest institutions of higher education and research in Scandinavia. LU has for several years been ranked among the world’s top 100 universities according to QS or Times Higher Education rankings. The ambition of LU is, according to its website, “to continue to be a world-class university that works to understand, explain and improve our world and the human condition”. As emphasised by Frederik Andersson, Dean of the School of Economics and Management (SEM), and Kristina Eneroth, Pro-Vice Chancellor for International Affairs, LU aims at providing the best educational training possible to its students.

LU integrated entrepreneurship into its teaching activities at the beginning of the 21st century and received considerable funds for doing so. In order to keep its entrepreneurship education up to date, the university has continuously reflected upon its teaching activities and has consistently adjusted its educational approach by developing new best practices.

²²⁶ Source: Lund University (2014). Lund University – Education, Innovation and Research since 1666. Information Brochure. Lund: Lund University.

The institution with the strongest link to entrepreneurship at LU is the Sten K. Johnson Centre for Entrepreneurship (SKJCE). As stated on its website, the ambition of SKJCE is “to continue developing the centre into a dynamic arena for national and international cooperation between academia, industry and organisations with an interest in entrepreneurship and innovation”. Due to this, the close connection to the Öresund region and to actors in the IDEON Science Park is seen as source of competitive advantage. SKJCE offers a variety of demand driven courses at five of the eight different faculties of LU, but also undergraduate and graduate programmes where students from different disciplinary backgrounds are admitted. Of particular importance is the Master Programme in Entrepreneurship (MPE) with two distinct tracks, namely “New Venture Creation” (NVC) and “Corporate Entrepreneurship and Innovation” (CEI). This Master Programme has obtained considerable attention on a global and national scale and competition among the applicants is fierce with approximately 900 applicants for 40 spots. Concerning the teaching methods, a focus is set on action-reflection teaching methods while close connection with companies and support systems in the region is aspired.

Several extra-curricular activities with regard to entrepreneurship education are offered at LU. One example includes the awards and scholarships that are provided to students based on pitched business ideas (e.g. Dragons at the University or Leapfrogs). Further examples include entrepreneurship-oriented initiatives, such as Venture Lab (a student incubator that inspires and gives business advice), Venture Cup (a business plan competition) and FENA (a student association for entrepreneurship).

13.1.2. Leadership and governance

Importance of government strategies

In Sweden, an overall promotion of entrepreneurship and a societal drive toward general interest in entrepreneurship can be observed. Since LU is a governmental university, the Swedish government has strongly influenced its entrepreneurship education strategy, most importantly through the provision of seeds and funding.

SKJCE is funded to a large extent by the government (see section 1.1.3). The development of SKJCE began in the year 2000 when Hans Landström was appointed professor in entrepreneurship at SEM of LU. The move to increase the focus on entrepreneurship education at LU was initiated by the Swedish government as a push strategy. In turn, in the year 2003, Prof. Landström received additional funding for entrepreneurship education from the Vice Chancellor of LU. As a result, Prof. Landström employed Prof. Marie Löwegren and they jointly developed undergraduate courses for entrepreneurship. In 2006, the MPE with the NVC track was launched by SKJCE (see section 1.2). SKJCE nowadays offers a wide range of entrepreneurial courses at four out of the eight faculties of LU (see section 1.2).

The national government of Sweden aimed at developing cutting edge education in the field of entrepreneurship in Sweden. SKJCE successfully applied for funding and received funds for its entrepreneurship education from the government from 2009 until 2011. However, in order to continue its funding from 2011 onwards, SKJCE started a fundraising campaign and received 20 million SEK from Sten K. Johnson. This funding enabled SKJCE to expand its entrepreneurship education activities and to hire new employees.

On its website, SKJCE made the following remark related to the importance of government funding for its establishment: “The government funds have allowed us to strengthen our educational and research portfolio in accordance with the announced ambitions. The time limitation of the governmental allocation of resources has required a focus on creating long-term funding. In the spring of 2011, the donation from Sten K. Johnson enabled long-term investments and allowed us to continue building a lasting entrepreneurial arena formed as a centre for entrepreneurship.”

Importance of entrepreneurship in the university’s strategy

Entrepreneurship is of high importance for LU. In the beginning of the 21st century, LU largely concentrated on entrepreneurship and innovation by directly addressing these topics. However, the roots for this development were set beforehand. Within the last decade, entrepreneurship has continuously become more important and more of a common discipline to the university.

Since 2004, systematic work has been carried out in order to build an educational structure within the field of entrepreneurship at LU.

Innovation represents one of the four priority areas of the strategic plan of LU. Within this strategic plan, the “need to develop training in both innovation and entrepreneurship” is clearly mentioned (see http://www4.lu.se/upload/Strategic_plan_20120216.pdf). Hence, an explicit focus on innovation with a close linkage to entrepreneurship can be revealed at LU. According to Frederik Andersson, Dean of SEM, and Kristina Eneroth, Pro-Vice Chancellor for International Affairs, LU has always been innovative. Innovation has been one of the priority areas for LU since its establishment in 1666. Since LU represents an old and large university which generally leaves little room for creativity, an explicit focus on innovation is quite distinguishable. According to the interviewees, LU is trying its best to be innovative although innovation comes at a high cost for the university.

Extent of high level commitment to implementing entrepreneurship

A strong extent of high level commitment to implementing entrepreneurship can be observed at LU. Entrepreneurship was a priority of Per Eriksson, who held the position of Vice-Chancellor of LU until 2014. Prof. Eriksson wants to see more output of university research and continuously pushes for entrepreneurship and innovation. One interviewee mentioned that there has been an increase in entrepreneurship activity at LU in the past five years mainly due to Eriksson’s initiative.

Level of faculties’ and units’ autonomy to act

When it comes to entrepreneurship education, the autonomy to act is mixed between bottom-up and top-down initiatives. Most activities are initiated bottom-up from respective centres, institutes or departments such as SKJCE. Simultaneously, entrepreneurship education is promoted from the top as well, for instance during the current 350-years celebration of LU in 2016. For that purpose, a funding campaign for scholarships was created. Entrepreneurship and innovation are one of the priority areas for this campaign (see <http://givetolunduniversity.lu.se/350-years-lund-university>).

Organisational implementation

LU pursues an explicit and embedded approach to entrepreneurship education. Geographically, LU is partially located next to IDEON Science Park in the middle of the local business network. LU strongly uses this network for its entrepreneurship education by bringing in external partners into its educational activities (see section 1.5).

Entrepreneurship courses are foremost offered at the SEM, next to the Faculty of Engineering, Science and Humanities, and Technology. Besides, entrepreneurship education is becoming more important at the Faculty of Fine Arts. As stated by the interviewees, no direct resistance to entrepreneurship education at LU can be observed although different focuses and priorities for entrepreneurship can be noticed. Some faculties continue to be reluctant to focus on entrepreneurship; they want to conduct research but do not aim at commercialising the findings and therefore they remain less entrepreneurial. Due to this, the problem of the full curricula was further emphasised leaving little room for the integration of additional entrepreneurship-related courses into the curricula.

The organisational implementation of entrepreneurship education ultimately remains a question of resources, which makes funding for elaborate and continuous entrepreneurship education of utmost importance (see section 1.1.3 below). The majority of all funding is provided by the government to LU, which then distributes it to the faculties, which in turn distribute funds to the respective departments. The reporting, in contrast, goes from the departments to the faculties to LU to the government.

13.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

The existence of excellent researchers and teachers was highlighted as essential for the provision of entrepreneurship education by several interviewees. An increasing pressure to attract top researchers and teachers at universities like LU can be observed. This was perceived as one of the major difficulties in entrepreneurship education due to the fact that the pay level

and spread of salary in academia is comparatively low. Thus, education does not always seem to pay off which can discourage the pursuit of academic careers. Moreover, a need for female professors can be observed. In order to attract (female) academics for a career at LU, individual negotiations for employment are offered, for instance with regard to the percentage of time devoted to teaching (usually 70%), research (usually 20%) and administration (usually 10%). Frequently, a desire for a stronger focus on research is expressed from applicants that can, for instance, be addressed through increased engagement in third-party research projects.

Financial resources for entrepreneurship education

It was mentioned by one interviewee that all over Sweden universities are struggling with funding and hence, the development of a long-term funding strategy was emphasised as highly important for the continuous success of entrepreneurship education. Funding for entrepreneurship education at LU and SKJCE originates from a variety of sources. First, funding is provided from national education funds. Second, LU receives private donations with a focus on entrepreneurship. As mentioned in 1.1.2 above, innovation and entrepreneurship are considered as a priority area for a funding campaign due to LU's 350 years celebration (see section 1.1.2 and 1.5). Third, funding can be ensured through grants received in the form of third-party projects in entrepreneurship. Fourth, since 2010/2011 non-EU students have to pay tuition fees in Sweden of approximately 120,000 SEK a year as opposed to EU students who can study for free in Sweden. Nonetheless, the number of non-EU applicants at LU continues to rise. These studying fees serve as an additional source of income for the university. This money is directly distributed to the respective faculties and can, as a consequence, be partially employed to cover educational expenses in the area of entrepreneurship. The funding campaign due to LU's 350 years celebration partly focus on scholarships for non-EU students. To manage its financial resources, SKJCE possesses its own advisory board for fundraising and advising activities which entails company representatives and alumni (see section 1.5).

13.2. Entrepreneurship in curricula and teaching

13.2.1. Overview of curricular offers

LU offers a wide range of programmes in entrepreneurship for a diverse group of students at different faculties and departments. The portfolio of entrepreneurship courses comprises four out of eight faculties, namely SEM, Humanities and Theology, Engineering and Science. On the whole, entrepreneurship courses are mostly provided by the SEM. There are several interdisciplinary courses which students from all faculties can attend and a number of tailored courses for specific fields of study. The diverging contexts and target groups require differentiated teaching approaches. Hence, in order to meet the requirements of this diversity, the design of the courses (i.e. part of a module vs. free-standing, mandatory vs. elective, part-time vs. full-time) varies with the context it is offered in. A total of six courses are held in English and the remainder is taught in Swedish. An overview of all entrepreneurship education offers at LU on the undergraduate, graduate and PhD level can be found in exhibit 1 below.

Concerning the undergraduate level, there are several courses on entrepreneurship tailored to certain degrees, such as business administration, humanities and technology. They are either compulsory or voluntary within the degree. The majority of undergraduate courses related to entrepreneurship require prerequisites such as an amount of accomplished credits or certain relevant courses.

Next to two graduate courses for students in economics, social science and film and media production, there is a Master's Programme in Entrepreneurship (MPE) with two tracks: New Venture Creation (NVC) and Corporate Entrepreneurship and Innovation (CEI). The tracks have a different focus but are based on the same teaching philosophy which aims at providing learning from action, theory and experience. Due to the emphasis on SKJCE in this case study, the following sections will focus on the MPE as SKJCE's well-known flagship programme.

On the PhD level, there are two interdisciplinary entrepreneurship courses as well as one course specialised for students in technology, science or medicine. One of them is a theoretical course jointly offered with CIRCLE, a research centre for innovation studies. The other is a hands-on course on how to start a business, carried out in cooperation with LUIS (see section 1.5).

Exhibit 13-1: Overview about curricular entrepreneurship education offers at Lund University

No.	Name	Objectives	Target group	Offered since	No. of participants in 2014/15
Undergraduate Level					
1	Course: Entrepreneurship	Give a practical and theoretical introduction on how commercial and social entrepreneurship emerges in the economy. An emphasis is set on entrepreneurial opportunity recognition, interactions of the entrepreneurial team, the idea and the environment.	Undergraduates in Business Administration, having completed 60 ECTS credits.	2009	28 (autumn) 47 (spring)
2	Course: Innovation Management	Develop theoretical knowledge and practical ability in innovation management, supporting an innovative climate in existing businesses and managing innovation for the development and growth of the businesses.	Undergraduates in Business Administration, having completed 60 ECTS credits.	2009	30 (autumn) 42 (spring)
3	Course: Entrepreneurship and Project Management	Develop theoretical knowledge and practical ability in various aspects of entrepreneurship and project work as well as the students' initiative and creative ability.	Undergraduates with at least 30 ECTS credits, interdisciplinary (all faculties of LU)	2004	35
4	Course: Cultural Management: Project Management and Entrepreneurship in Arts and Humanities	Provide knowledge and training in how skills from previous humanistic studies can be used creatively in the development of new business opportunities and within project management.	Undergraduates having completed 60 ECTS credits in humanities.	2010	20
5	Course: Project Management and Entrepreneurship in Fashion Studies	Provide knowledge in the field of entrepreneurship including social and sustainable business models. Apply skills and methods in project management and in creating a business plan against the background of the students' competencies in fashion studies.	Undergraduates in fashion studies having completed four preconditioned courses.	2013	30
6	Course:	Give an introduction to the entrepreneurial	Undergraduates in technology	2009	70

	Business and Entrepreneurship	opportunities for engineers; provide knowledge on the entrepreneurial process and practice to create a business plan.	studies.		
Graduate Level					
7	Master's Programme: Entrepreneurship - New Venture Creation (NVC track)	Provide knowledge and experience on the creation of new ventures.	Undergraduates (B.Sc./B.A.), international, interdisciplinary	2007	26
8	Master's Programme: Entrepreneurship - Corporate Entrepreneurship and Innovation (CEI track)	Provide knowledge and experience on the renewal and innovation within established businesses.	Undergraduates (B.Sc./B.A.), international, interdisciplinary.	2010	18
9	Course: Small Business Economics, Regional Development and Entrepreneurship	Outline the importance of small business and individual entrepreneurs regarding innovation, employment and regional development.	Students in Master's Programmes in Economics and Social Science.	2010	20
10	Film and Media Production: Entrepreneurship	Provide an introduction and in-depth studies on the field of entrepreneurship in film and media production. Students gain experience in the role of producers, entrepreneurs, or business and project leaders by participating in various field projects.	Master students in the programme 'Film and Media Production' having completed 90 first-cycle higher education credits.	2012	30
PhD Level					
11	Course: Entrepreneurship - Commercialising your Research	Introduce entrepreneurship, innovation and commercialisation by providing theoretical knowledge on the entrepreneurial process and practical insights on exploiting a business opportunity in the form of a new business, licensing to an established company or by social entrepreneurship projects.	PhD students, interdisciplinary (all faculties at LU).	2013	25
12	Course: Futures of Entrepreneurship	N/A (not offered in 2014/2015)	PhD students, interdisciplinary (all faculties at	2013	25

	p and Innovation Studies		LU).		
13	Course: Entrepreneurship in Biotechnology	N/A (not offered in 2014/2015)	PhD students and Post-docs with an undergraduate degree in technology, science or medicine.	2009	20

13.2.2. Target groups

Main target groups of entrepreneurship education

The target group of MPE is interdisciplinary students with an undergraduate degree (BSc/BA) of at least 3 years/180 credits in any field of study. The admission requires English language proficiency (English 6/ Course B). The selection criteria are based on the applicants' curriculum vitae, grades, previous studies and a statement of purpose. Depending on the track, there are different screening procedures.

There is a high diversity among the students with 13 (NVC)/ 15 (CEI) different nationalities and age ranges from 22 to 41 years (NVC) and 23 to 39 years (CEI). MPE does not give priority to LU students and therefore comprises about 90% international students in the NVC track and 60% respectively in the CEI track. The gender composition of the students is about 69% male and 31% female in the NVC track and 61% male and 39% in the CEI track.

Continuous education

Some of the students applying for MPE already possess an entrepreneurial ambition at the start of the programme while others develop it later on. Around 50% to 60% of the students have a business background. The programme itself does not differentiate between the students' level of entrepreneurial experience. However, it offers tailored support for those who do lack entrepreneurial experience and require additional, tailored help.

Bridges to secondary education

LU employs close links to secondary education. The following is communicated in its publishing material: "In order to inspire an early interest in research and higher education among children and young people, we work with schools, put on science shows and theme days and run a science centre". LU invites high school students to the trade show where students display their project results.

Specificities

There is an enormous interest in MPE with roughly 900 applicants for 40 seats in the programme per year. Over the years, a constant increase in the number of applicants to MPE can be observed, with only a slight drop in applications directly after the introduction of tuition fees. Out of these 40 seats, 25 are directly allocated to NVC and 15 to CEI. Approximately 95% of students find employment after graduating, either through self-employment or through employment in existing businesses. One interviewee pointed out that MPE enjoys an excellent employer reputation.

13.2.3. Designing lectures and courses – basic curricular decisions

Intentions and objectives

According to the programme description, the main learning objective of MPE is to develop an understanding of entrepreneurship and entrepreneurial skills, to generate experiences and knowledge, and to prepare for an entrepreneurial career or work in the field of entrepreneurship.

On one hand, the **NVC track** offers the opportunity to gain practical experience in the field of venture creation and to develop entrepreneurial competencies. Students learn how to identify and exploit business opportunities by starting and managing new ventures (see <http://lusem.lu.se/study/masters/entrepreneurship.nvcr>).

On the other hand, the **CEI track** is designed for students with an interest in working in the field of business development and innovation in established businesses. The programme provides knowledge on opportunities for renewal and innovation in the organisation (see <http://lusem.lu.se/study/masters/entrepreneurship.cein>).

Contents

MPE as a one-year programme in total encompasses 60 ECTS, including 4 courses with 7.5 ECTS each and exam work with 30 ECTS.

The **NVC track** consists of four courses providing theoretical knowledge on the venturing process. Firstly, there is a course on "Opportunity Recognition" where students are introduced to the generation and evaluation of ideas, assigned to write a diary and ultimately present their ideas for which they receive feedback. During the process students are introduced to research from Lund University by LU Innovation System (LUIS; see section 1.5) which they could choose to continue to work with. Secondly, the students take part in an "Entrepreneurial Marketing" course. In this course, they meet with potential customers and conduct a feasibility analysis on their ideas. This includes a presentation joined by mentors and students giving feedback. Thirdly, there is a course on "Managing New Venture Growth" concerning the challenges for growth. The students develop business models in close collaboration with their mentors. Lastly, the "Entrepreneurial Finance" course covers sources of funding and includes interviewing venture capitalists and entrepreneurs.

Additionally, the students take part in a one-week *entrepreneurial challenge*. The purpose of this challenge is to gain experiences and to generate ideas for market opportunities. There are teams of 4 to 5 students who receive 100 SEK to realise their idea. The team that generates the most money wins a trophy. This challenge is supervised by SKJCE staff. At the end of the challenge the teams present their projects and hand in a learning report.

In order to support the students' entrepreneurial actions the NVC Programme provides a number of *guest lecturers* who are experts in various areas related to new venture creation. Furthermore, there is a *mentorship programme* where students are matched with an experienced mentor supporting them to advance their entrepreneurial career (see section 1.2.5).

Along with a highly intensive and motivating curriculum, time is allocated for students to pursue an *entrepreneurial project*, either on their own or in a team. Qualified teaching staff and experienced business mentors assist students in the venture creation process. The project is concluded with a business plan and an academic paper.

The **CEI track** includes four courses covering different aspects of corporate entrepreneurship and innovation management. Firstly, a course on "Corporate Entrepreneurship" gives an overview of the area and stimulates students' creative abilities through exercises. Among other tasks the students face, one is the "Corporate Challenge" in which students are challenged by the management team of an established company to come up with new business opportunities. The task is to convince the management team about the potential of these new opportunities. Within this course the students, together with the NVC track, undertake the "Entrepreneurial Challenge". Secondly, in the course "Organising for innovation and entrepreneurship", the students learn about fostering entrepreneurship and innovation in established companies. The course, among others, focuses on the role of leadership in fostering conditions for the exploitation of both new and existing opportunities within the current business.. Thirdly, the "Innovation Management and Open Innovation" course provides tools and models on innovation in general, and in particular those related to product innovation and development. Fourthly, students take part in the "Project and Research Methods for Entrepreneurship" course, which provides them with the knowledge and tools needed for undertaking the business development project and Master's thesis during the Internship.

A key component of the CEI track is the course "Internship and Degree Project" (30 ECTS). In this *project-based internship*, the student gains practical experience by working on and running an innovative project in an established and progressive company. Each student works as a

member of a team in his or her internship company. The team also includes the students' assigned mentor at the company. The innovation projects relate to issues such as the launch of new products, the renewal of the business model of the company, and the renewal and development of the innovation process in the company. The student's Master's Thesis is based on his or her respective focus. These internships are scheduled from January to June.

Methods and media

MPE employs lectures given by LU's academic staff as well as guest lecturers with entrepreneurs or company members. The courses comprise traditional case studies as well as live cases. There are hands-on, practical assignments and challenges the students have to accomplish. Students usually have to present their research or project outcomes. They also frequently work in diverse teams. The programme follows a personal approach, including supervision, feedback and interaction with the students.

As for the use of media, there is an E-learning platform students can use for communication and information purposes. This platform is employed by the MPE to collect knowledge and make it accessible to students. Therefore, it helps to create more homogenous background knowledge of students from different disciplines. In addition to this, the tool is also used for writing business plans. Furthermore, students are provided with an introduction to empirical research methods to deepen their research capabilities.

Informal evaluation of learning outcomes and feedback for students

Concerning the informal evaluation of learning outcomes in both tracks, students receive feedback from other students, academic staff and their mentors. Feedback is thereby often exchanged from one team to one another (e.g. an opponent team).

Using results of entrepreneurship research

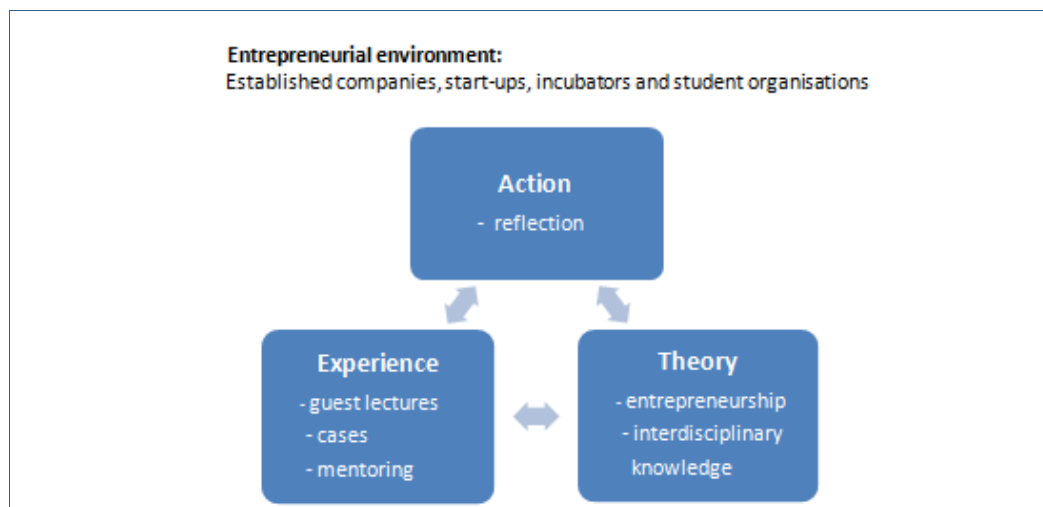
One unique aspect of LU – as stated on its website – is that the university employs a very close link between its education and research in order to “inspire innovative thinking on an academic foundation”. LU is highly research-oriented and possesses world-leading research groups in over 30 different fields. Most teachers are also researchers, which facilitates the integration of research findings into teaching activities. LU emphasises the integration of results from secondary and primary research on entrepreneurship education into teaching.

SKJCE has created a research program on entrepreneurship education, which builds on prior research on enterprise education and entrepreneurial learning. The goal of this programme is to generate scholarly knowledge which is of value for the international scholarly community and for developing and fostering its entrepreneurship education. In this context, there are four main research programmes in the field of entrepreneurship: “The Entrepreneurial Process”, “Entrepreneurial Learning and Education”, “Immigrant Entrepreneurship”, and “The Roots of Entrepreneurship Research”.

The outcomes are imparted to the students via textbooks, complementary articles which students work on in lectures and reading assignments. Entrepreneurship education is carried out by theory based lectures, workshops on topics such as creativity and guest lecturers to share personal experiences. Furthermore, the students' ability for business opportunity recognition is fostered.

This long-term research in entrepreneurship education has shaped the pedagogical view at SKJCE as displayed in exhibit 2 below. SKJCE's pedagogical view implies that entrepreneurial learning works best with an action-oriented approach with experience-based activities for the students in order to learn from practice. Additionally, the learning process requires reflection on the practice and gathering theoretical knowledge on entrepreneurship. Therefore, entrepreneurship education embraces action as well as learning from theory and is thus termed as “action-reflection theory”.

Exhibit 13-2: SKJCE's Pedagogical view



Source: Based on SKJCE website, 2014

13.2.4. Setting of entrepreneurship teaching

Locations

The Master's Programme is located in the Lund campus of LU. Supervision and examination takes place at the SKJCE. Furthermore, there are off-campus activities, such as those at companies which serve as locations of entrepreneurial learning. As for the **NVC track**, there are company visits at high-tech or biotech enterprises, as well as banks, or companies in the construction business. The **CEI track** encompasses the internship which takes place within the setting of the company. Furthermore, all students in the track undertake organised visits to the internship companies. The aim is to learn about corporate entrepreneurship and innovation in different contexts, as well as different industries.

Timing

The Master's Programme is designed as a full-time study programme taking place during the day. It is an intense programme with a time span of at least 40 hours a week. The next study period takes place from 31st of August 2015 to 5th of June 2016.

Formal evaluation of learning outcomes

The evaluation of learning outcomes is usually conducted by grading. Additionally, according to the type of course, the students have to hand in journals on their ideas or learning reports from challenges and company visits to foster learning from experience. These learning outcomes influence the grading, and the feedback based on the learning outcomes is provided in written form.

13.2.5. Instructors: teachers and mentors

Professors, other employees and external lecturers of the university

SKJCE focuses on three interrelated but different areas, namely education, research and external relations (see section 1.5). While the Centre was already quite well established in its educational activities, it was therefore decided to focus on the two remaining areas. More researchers were required to expand their research activities and it was desired to broaden the external relations by acquiring more mentors and internship placements for the students.

In terms of SKJCE's employees, most teachers are simultaneously engaged in research which facilitates the close linkage between research and education described above. Attention is paid to excellent teaching abilities when hiring new employees. At SKJCE the majority of the employees possess a business background with a focus on entrepreneurship. Entrepreneurship

education at LU is provided mostly by employees from SKJCE, next to courses offered by staff from other departments at LU.

"Real entrepreneurs" as teachers

There is a strong collaboration with the local and regional business community within the MPE. Experienced start-up entrepreneurs, as well as those who have experienced entrepreneurship within established companies, are integrated as guest lecturers or mentors in entrepreneurship education. The aim is to share their entrepreneurial experience with the students (see section 1.5).

Mentors

The **NVC track** provides a mentor to each student for personal and business development purposes. The meetings between mentors and students should take place at least once a month. These mentors are entrepreneurs or managers (see above). They are volunteers with an interest in using their competencies to support young entrepreneurs and are eager to help, give something back, network and add value to students. The mentors are regularly integrated into teaching and for instance, give the students feedback on their feasibility analysis of ideas. Interviewed students mentioned that the mentorship is of great value due to the obtained feedback and the possibility to "get into the Swedish society". Since mentors are regularly invited to social events within the scope of MPE, mutual networking opportunities for students, mentors and academic staff can lead to future cooperation as an outcome (see section 1.5).

Within the **CEI track** students are not assigned mentors. The exception is the project-based internship and degree project during the second semester. Each student is assigned to an employee at the internship company, who serves as a mentor for the students' professional development and acts as a joint-supervisor for the innovation project, along with the academic supervisor. Both the student and mentor work together at the company and meet at least once a week. However, neither students nor mentors are remunerated for their participation in the internship project.

13.2.6. Management of entrepreneurship education

Teacher and trainer management

It is explicitly mentioned by LU that educational development and the exchange of best practices in teaching is of utmost importance to ensure excellent teaching skills.

In terms of teacher management, SKJCE runs meetings and seminars for discussing and sharing pedagogical beliefs. The programme director is responsible for introducing staff to teachers. An extensive management is required for the mentors who play a crucial role in the MPE encompassing the acquisition of individuals, effectuation and evaluation of the process.

Within the **NVC track**, mentors are identified and contracted by Lottie Olsson Norrsén, Director of External Relations at SKJCE. The selection criteria for the affiliated mentors are profound knowledge in the field of entrepreneurship and business development and an interest in getting involved in the student's business development process. Furthermore, they have to be available for a monthly meeting with the student throughout the academic year.

Introductory meetings with all mentors, where responsibilities are discussed, take place in October. In these meetings mentors and students present themselves and have roundtable discussions. This gives them the possibility to check the match and to exert preferences. The decision about the matching is made by the respective programme manager and Lottie Olsson Norrsén.

Lottie Olsson Norrsén and the Programme Director are responsible for initial contact with the companies that show interest in participating in the Internship Programme of the **CEI track**. The decision for selecting the companies and projects is based on individual meetings with members of the companies and the potential mentors. Consequently, the selected companies are presented to students and each team, comprised of two students with diverse backgrounds, is matched to a company and project. Companies, as well as students, can thereby choose based on their preferences. Although there is growing interest within the companies for participating in the Internship Programme, at times it is difficult for them to find mentors who can devote the time needed for the mentorship.

Internal and external network management

MPE links students with different educational and cultural backgrounds and offers networking opportunities for social and business purposes. This context is favourable for building competent teams, for collectively creating innovative ideas, and for accessing international markets.

Next to informal networking within the scope of MPE, official networks in the field of entrepreneurship can also be found at LU. Firstly, "The Sustainable Business Hub" is "a leading cleantech-network organisation in southern Sweden" that supports "cleantech companies to strengthen their competitiveness and to expand their export reach" (see <http://www.sbhub.se/>).

Secondly, a network called the "Entrepreneurial Society of Lund University" was formed in 2013 as an invite-only network in order to gather entrepreneurs in Lund for guest lectures, research cases and for spreading knowledge of entrepreneurship (see <http://www.entrepreneur.lu.se/samverkan/entrepreneurial-society>). It invites entrepreneurs from the Lund region for meetings on entrepreneurial topics, such as "Africa as a new market" or "growth of Small and Medium Enterprises". This formation is intended to foster cooperation with actors in the neighbourhood. For further aspects of external relationships related to entrepreneurship education see section 1.5.

Evaluation of courses and programmes

Evaluation of courses is of utmost importance at SKJCE since the evaluation of entrepreneurship education represents one of its main research areas. A continuous reflection of its entrepreneurship education activities is performed internally in response to the action-reflection approach leading to regular adjustments and developments of new practices. When it comes to external evaluations, SKJCE received a favourable evaluation of its entrepreneurship education activities by a national evaluation committee. Moreover, SEM passed its EQUIS accreditation with distinction. One challenge that was mentioned in the context of the evaluation of entrepreneurship education is that tension between academics and practitioners in the national evaluation system can be noticed.

13.3. Extra-curricular activities related to entrepreneurship education

13.3.1. Overview of extra-curricular entrepreneurship activities

LU offers a variety of extra-curricular activities in the field of entrepreneurship education to its students. In the table below, a selection of extra-curricular activities provided at LU is displayed. These activities will be briefly described in the boxes subsequently. Further activities that are entirely initiated by incubators without direct involvement from LU, such as Demola (a project-based initiative where students work on solving global problems) are outlined in section 1.5.

Exhibit 13-3: Overview of extra-curricular EE activities at the University of Lund

No.	Name	Objectives	Target group	Offered since	No. of participants
1	Venture Cup	To provide a competition for students who are looking to develop their business idea and start a business; to increase awareness for entrepreneurship and establish entrepreneurial mindsets	People in Sweden with early-stage entrepreneurial ideas, mainly within 18-33 years of age, everyone can compete	1998	27,000 participants since 1998
2	Dragons at the University	To offer students a possibility to practice their presentation techniques in a competitive way and to pitch their business ideas for venture capitalists – the "Dragons".	MPE students or students with an incubator company at Venture Lab	2010	60 students participated in total since 2010
3	Leapfrogs	LUIS provides students with financial support to develop	Students from LU, Malmö Högskola,	2012	84 project evaluations in

		their business ideas during three months of full time work	BTH, SLU Alnarp and Högskolan Kristianstad		total since 2012
4	Activities by FENA (e.g. Innovation Bazaar, Business & Beer, Learn to Talk, Connection Board, FENA TV)	To encourage entrepreneurial behaviour from students	Students from LU, interdisciplinary	2004	Appr 70 participants per activity
5	European Entrepreneurship Education Workshop and European Entrepreneurship Award	To foster a better understanding of entrepreneurship education and to exchange best practices (Workshop); to highlight the importance of teaching and learning in the area of entrepreneurship in Europe; to further stimulate and promote innovative teaching methods within the field; to diffuse the state of the art in entrepreneurial education among scholars, policymakers practitioners, and people involved in entrepreneurship education on university level (Award)	Researchers, educators and policy-makers interested in entrepreneurship (Workshop); Any person or organisation active in entrepreneurship education in Europe who has contributed to teaching entrepreneurship, through education, research or outreach activities (Award)	2012	30-50 a year

Venture Cup

Venture Cup is a national non-profit organisation that was founded in 1998 (see <http://www.venturecup.se/english/>). Originally, Venture Cup was initiated by McKinsey, being inspired by Harvard. It can be distinguished in four regions, namely Venture Cup North, West, East and South. LU belongs to Venture Cup South which covers the entire Southern part of Sweden and consists of 50 to 60 network members including entrepreneurs, managers and alumni. Venture Cup South presently entails one full-time and one part-time employee. Funding remains a challenge for Venture Cup with funds currently provided by the Swedish government in addition to sponsoring by LU and local companies. Venture Cup possesses a budget of approximately 2,000,000 SEK per year.

Venture Cup is the organiser of a business plan competition. The activities of Venture Cup can be distinguished among two structures (idea and business plan), four categories (life science, people & society, environment & energy, and web, software & media) and three different phases (business idea, pitch and business plan).

The Venture Cup-process takes place twice a year, in fall and spring. The Cup is targeted at all faculties of LU, but also at other HEIs in the region. As a result of a competition, four winners, respectively in fall and in spring are identified per region who, in turn compete in the national cup. Competitions mostly take place in teams of two to three although no fixed number of team members is set. Participation is free and all teams can decide whether they want to participate in all three phases of the competition or in only one phase. The participating teams get evaluated by the Venture Cup network. Evaluation criteria include the innovativeness of the idea, the team spirit and competencies, the need and credibility of the market as well as the scalability in terms of the growth potential and the environmental impact. Venture Cup aims at creating further awareness from students for its competition in order to increase the rate of applications. A further goal is to raise the number of contestants with a foreign background as well as more teams led by women.

Venture Cup is also directly integrated into entrepreneurship education at LU by being part of existing entrepreneurial courses on topics such as how to be more creative, how to write a business plan or how to pitch (see section 1.2). Members from Venture Cup hold lectures or workshops during entrepreneurship courses at SKJCE or in Fashion Design, Engineering or

Humanities studies. In the past, Venture Cup has also provided an entire course with 10 workshops by itself.

Dragons at the University

Dragons at the University is a competition with prizes where MPE students can pitch their business ideas in front of five venture capitalists (see <http://www.entrepreneur.lu.se/en/about/events/dragons>). Winners of the pitches are in turn selected in the categories of trustworthiness, potential of the project, and rhetorical qualities. This project was initiated by SKJCE in 2010 within the scope of the MPE. By now, it is offered as collaboration between SKJCE and Venture Lab. For further information on Venture Lab, please see section 1.5.

Leapfrogs

Leapfrogs is an initiative by LUIS in cooperation with Venture Lab where students receive 27,000 SEK as financial support for developing their business ideas (see <http://www.leapfrogs.se/en/aboutleapfrogs>). The scope of the initiative is three months of full-time work. This shall enable the students to take a 'long leap' in order to decide whether to implement an idea further or not. For further information on LUIS, please see section 1.5.

FENA

The name FENA is a Swedish abbreviation that, translated into English, becomes an acronym for "Association for Entrepreneurship and New Ventures" (see <http://fena.nu/>). Hence, FENA is a student organisation in the field of entrepreneurship. FENA was founded in 2004 by three students from LU as a meeting place for motivated students. The organisation has at present around 150 interdisciplinary members. Membership comes at no costs and is open to all faculties of LU, although the majority of the current members represent business and engineering students. FENA is funded by sponsorship from companies and corporations. One of its key values is its high-risk tolerant, non-judging culture to counter the fear of failure towards entrepreneurship, which can be frequently observed. FENA operates as an independent and flexible organisation with its own projects. Although LU is a partner, FENA's activities are not directly related to entrepreneurship education offers at the university.

One example of an activity organised by FENA is the "Innovation Bazaar", a start-up exhibition for companies. Besides, FENA also hosts a mingle event for students, start-ups and employees, called "Business & Beer". This event entails a speaker with a theme centered on entrepreneurship. It takes place once a month and is visited by 70 students on average. Examples of speakers include Axel Esser from "Tuna Spot" or Alexander Zinnert from "Salads & Smoothies". A new project that is at the moment being launched is "Learn to Talk", where students are taught and supported in speaking publicly. FENA also created a "Connection Board" as a digital pin board for ideas and problems and for facilitating cooperation in addressing these problems. Another project by FENA is "FENA TV", a short documentary series about companies and people that play a role in the innovation system.

European Entrepreneurship Education Workshop and European Entrepreneurship Award

LU annually organises a "European Entrepreneurship Education Workshop" for researchers, educators or policy makers in entrepreneurship education to foster a better understanding of the field (see <http://www.entrepreneur.lu.se/en/about/events/eeew>). Within this workshop a "European Entrepreneurship Award" is awarded to "a person or organisation which has significantly contributed to the improvement of the entrepreneurship education in academia in Europe" (see <http://www.entrepreneur.lu.se/en/about/eeea>). Next to the honor and a diploma, the laureate obtains a prize sum of 100,000 SEK. An evaluation committee of five members, including Prof. Hans Landström from SKJCE, evaluates the nominee's entrepreneurship

education approach on the basis of its novelty and innovativeness, its potential impact and transferability, and its relevance for a public beyond academia.

13.4. Institutional aspects of entrepreneurship education

13.4.1. Organisational set-up and change

Marie Löwegren, Director of SKJCE, stated that the entrepreneurship education activities described above are partially based on new organisations, especially when it comes to the LU Tech Transfer Office, LU Innovation and the creation of SKJCE or the activities at IDEON Science Park (see section 1.5). However, these organisation models are not per se new and their success rates vary.

Marie Löwegren also pointed out that the coordination and integration of a new field like entrepreneurship in a large university such as LU is different compared to a smaller business school. On one hand, when a large university decides to focus on entrepreneurship it can really make a difference, while on the other hand the coordination and integration of entrepreneurship at the university could be a challenge. This bureaucratic system and the organisational structure make the system quite slow.

The creation of SKJCE as a centre with a particular focus on entrepreneurship is vital for coordinating entrepreneurship at a large university like LU. In terms of its organisation, SKJCE is part of the SEM faculty of LU. SKJCE's educational activities are however executed via the School's Department of Business Administration.

13.4.2. Laws, statutes and codes

In Sweden, entrepreneurship has recently been introduced as a mandatory topic in secondary school education and in the long run, this will have great importance for entrepreneurship education at the university level.

Moreover, Sweden possesses a unique 'teacher exception' law which implies that the researchers and teachers at the university own their intellectual properties, and not the university (see section 1.5). Funding for university-based start-ups is managed through support services like Lund University Innovation System (LUIS, see section 1.5).

As emphasised by Marie Löwegren, entrepreneurship as a research and teaching field is on its way to mature and institutionalise by becoming more 'mainstream'. Sweden was one of the first countries in Europe to adapt entrepreneurship in their curricula. On one side, the advantage of the institutionalisation process is that entrepreneurship has been an integral part of the academic system with regard to courses and positions. On the other side, the disadvantage is that it will be evaluated by traditional measures and the research and education could not be as creative and 'out of the box' as it has been before.

In terms of incentives for staff to engage in entrepreneurship education, no concrete material or immaterial incentives were mentioned. It was solely stated that good students are more fun to teach and that a variety of teaching methods can be employed in entrepreneurship education, such as case studies, which makes teaching more diversified.

13.4.3. Mindsets and attitudes

The educational activities described in section 1.2 and 1.3 above explicitly and/or implicitly serve the purpose of creating entrepreneurial mindsets. They are able to achieve this by raising awareness for the importance of entrepreneurship and by encouraging entrepreneurial behaviour. One interviewee stated that a creation of entrepreneurial mindsets is of particular importance for the culture and creative sector (see section 1.5 and 1.6).

13.5. External relationships related to entrepreneurship education

13.5.1. Types of relationships with external stakeholders

LU in general and SKJCE in particular are deeply embedded into their local environment through their location next to IDEON Science Park. Hence, collaboration with external stakeholders is strong and represents a focus of this case study. Below an overview of the primary external stakeholders involved in entrepreneurship education at LU can be found. Each stakeholder group will be described in more detail subsequently.

Exhibit 13-4: Overview of external stakeholders involved in entrepreneurship education at Lund University

No.	Stakeholder	Type of involvement in Entrepreneurship Education
1	Enterprises	Sponsors, investors, lecturers, mentors, partners
2	Alumni	Advisory board member, promoter, evaluator
3	Student organisations (Venture Cup, FENA, LUSIC)	Events, competition, networks, organisation of events and competitions
4	Support Services (LUIS, Almi, Teknopol)	Funding through loans and venture capital, business advice, commercialisation and verification support, marketing and Intellectual Property screening, patenting support
5	Incubators (VentureLab, Ideon Innovation, TCP, LSI, LIFT)	Support of start-ups through funding, coaching sessions and business advice, networking and co-working space, organisation of lectures, seminars and events
6	Science Parks (IDEON Science Park)	Networking, cooperation, exchange, events, co-working space

13.5.2. External stakeholders involved in entrepreneurship education

Enterprises

Local and regional enterprises are deeply integrated into entrepreneurship education at LU and SKJCE. As sponsors, entrepreneurs can donate money or assist in the organisation of events, such as the 350 years celebration of LU where innovation and entrepreneurship are one of the prioritised areas (see section 1.1). Further sponsoring possibilities include yearly alumni, mentor and student networking dinners and societal activities or dinners within the scope of ESU, which is an 8-day conference for European PhD students in the field of entrepreneurship. Sponsoring is also needed for the yearly student trade show from the NVC Master students to exhibit their business ideas and for activities by the Entrepreneurial Society at LU (see section 1.2). Moreover, entrepreneurs and company representatives are situated as advisory board members of the SEM. Besides, they can be engaged in entrepreneurship education as guest lecturers and mentors or cooperate with SKJCE by offering internship placements for entrepreneurship students. Ultimately, cooperation with local enterprises is sought to generate possibilities for future employment of graduates since a high employability of its graduates is of utmost importance to the management of LU.

Alumni

LU and SKJCE collaborate strongly with its alumni in its entrepreneurship education. To begin, all alumni from the MPE (see section 1.2) of SKJCE receive a survey to evaluate the Master's Programme and to generate an overview of their current jobs. SKJCE consequently keeps its own alumni list and aims at mapping its alumni in the future. Alumni who have become successful entrepreneurs are promoted at conferences by SKJCE. Furthermore, one alumnus is always included as an advisory board member of SKJCE. Next to the initiatives by SKJCE, LU is currently launching a university-wide centralised online alumni platform to facilitate communication with alumni on a university level. One example of an alumnus that remains in

close cooperation with LU is Björn Almér, founder of Barista Fair Trade Coffee (see <http://www.socialinnovation.se/sv/om-oss/partners/partner-barista-fair-trade-coffee/>)

Student organisations

Student organisations are deeply embedded into entrepreneurship education at LU. Examples of student organisations with a clear linkage to entrepreneurship education include **FENA** and **LUSIC**. LUSIC is an abbreviation for "Lund University Social Innovation Center" and is a social and humanities student organisation that aims at creating a cross-sectoral, interdisciplinary social innovation hub that addresses social problems in an entrepreneurial manner (see <http://www.lusic.se/>). For further information on Venture Cup and FENA see section 1.3.

An additional linkage between the student organisations at LU and SKJCE is the fact that SKJCE also uses joint events by student organisations or incubators to present itself and to collaborate with one another as organiser. Examples of this include the pitching competitions for Dragons at the University with the student incubator Venture Lab (see below) or the guest lectures and workshops for Business and Beer by FENA (see section 1.3).

Support services

Lund University Innovation System (LUIS) as a link between academia and business represents a hub for innovation and commercialisation of research at LU (see <http://innovation.lu.se/en>). At LU, researchers own the rights for their inventions within the university context while LU itself is not allowed to engage in business activities. LUIS therefore aims at working with students and researchers from LU in order to generate benefits and growth for society through entrepreneurial activities. At the moment, LUIS employs between 20 and 25 employees and is funded by the administration of LU. Business ideas get evaluated by LUIS employees jointly with the inventor. Evaluation criteria of a proposed business idea are its market need, the uniqueness of the approach, the results of a cost-benefit analysis and the competition and related alternatives. Acceptance rates of the evaluation for the applicants are approximately 30%.

LUIS provides free support in form of business advice, commercialisation and verification support as well as marketing and intellectual property screening. It also helps with the patent initiating process by going through the screening, novelty search and application stages. LUIS further offers non-refundable funding to start-ups. The maximum amount of funding provided per enterprise through LUIS from the national government is 300,000 SEK. An additional 300,000 SEK can be obtained by IKS, an innovation office for the South of Sweden, as initial salary for an entrepreneur. Further capital can at times be received on top so that the maximum amount of possible financial support for start-ups can be up to 1,000,000 SEK. The desired outcome of LUIS support activities are the establishment of new companies or the lending of a license to companies. One famous start-up example with support from LUIS is Sensative, a company that produces thin and long-lasting window and door sensors (see <http://www.sensative.com/>).

As mentioned above, LUIS can also provide support for students from LU with innovative business ideas. As a first example, LUIS provides financial support to students with business ideas within the scope of Leapfrogs (see section 1.3). In addition, LUIS operates as a sister organisation of the incubator Venture Lab (see below) by paying part of their budget and by providing two trainees for assistance. However, LUIS does not compete with Venture Lab. Instead, they offer complementary services. Students usually receive consultation from Venture Lab beforehand and then approach LUIS. LUIS aims at fostering entrepreneurial behaviour from LUND's student population by connecting students and researchers to find entrepreneurs. It directly engages in entrepreneurship education through the provision of an entrepreneurship course with Marie Löwegren from SKJCE. Next to that, employees from LUIS offer guest lectures and advice on pitching in an entrepreneurship course at LU called "Clinnovation" (see section 1.2). In this course, 40 third-year civil engineering students work on 20 entrepreneurial projects in the area of bio-medics and LUIS grants a prize to the team that performs best in a pitching contest. In addition, LUIS is involved in the organisation of student competitions, such as "Research to Reality" or the "FENA Challenge" (see section 1.3) to create awareness for students for its entrepreneurial support opportunities. Ultimately, SKJCE cooperates with LUIS for patenting innovative business ideas of its students.

Besides LUIS, further support services that co-operate strongly with LU are **Almi** and **Teknopol**. Almi assists in creating opportunities for viable ideas and companies to be developed

by providing advisory services, loans and venture capital through all phases of the business creation process (see <http://www.almi.se/English/>). Teknopol offers free professional business advisors and their networks to potential entrepreneurs as support (see <http://www.teknopol.se/what/>).

Incubators

In total, there are 43 national incubators in Sweden out of which five incubators are located in Lund: "**Venture Lab**" (a student incubator), "**Ideon Innovation**" (a business incubator that fosters growth of start-ups), "**The Creative Plot**" (TCP; an incubator for the cultural and creative sector), "**Life Science Incubator**" (LSI; an incubator for life sciences) and "**The LIFT Incubator**" (an incubator for service-oriented companies). All of these five incubators with the exception of LSI are located within the IDEON Science Park. According to the website of the science park, "the incubator processes, encompassing strong, committed contact networks, and cooperation with external companies, universities, the innovation system and financiers, create the best possible conditions for transforming good ideas into business". Three of these five incubators are described in detail below.

Incubator: Venture Lab

Venture Lab is organised as a part of SKJCE and presents itself as a "platform for students who want to develop their ideas and start a business or a project" (see <http://www.venturelab.lu.se/>). Venture Lab therefore directly targets its offers at students with entrepreneurial intentions from all eight faculties of LU. The two main evaluation criteria for applicants are the willingness of the entrepreneurs to develop themselves and the uniqueness and growth potential of the presented business idea. The current Venture Lab team consists of two full-time employees and two business developers with a 40% position each. Venture Lab's employees express the goal of expanding its alumni network which consists of approximately 300 alumni. At present, Venture Lab has a yearly budget of 2,000,000 SEK with financial support being provided by LU. Students receive free and confidential coaching sessions and free office space in a co-working environment with numerous entrepreneurs at IDEON Science Park for a duration of up to one year. Moreover, lectures, seminars and events are offered as inspirational activities to the students, partially in cooperation with LU.

An activity that is also organised by Venture Lab is the "Tuesday Breakfast", a weekly breakfast where students, entrepreneurs and members from the incubators mingle over breakfast. This event is regularly followed by a "Pitching Contest" organized by Ideon Innovation where potential entrepreneurs can pitch their business ideas and receive feedback from the audience according to the six-hats-approach. A "Business Run" for students, entrepreneurs and corporate employees is also offered as a networking event on a weekly basis. Competitions with prizes, such as Dragons at the University, are further offered in cooperation with SKJCE (see section 1.3).

On the whole, Venture Lab's activities can be broken down into three areas. Firstly, inspiration aims at creating an entrepreneurial attitude and awareness for students by offering seminars, guest lectures, trade fairs and events in the field of entrepreneurship, such as Tuesday Breakfast. These activities are offered at all eight faculties of LU at both graduate and undergraduate levels. Seminars last approximately 45 minutes; they introduce Venture Lab, talk about generating business ideas and present the steps of starting a business. These activities are oftentimes provided by student entrepreneurs who share their stories as inspiration. Secondly, counselling sessions are offered by business developers to students from all faculties of LU. These sessions are for free and can be used by students as frequently as desired. At present, around 350 counselling meetings with students take place. Thirdly, the incubator area consists of 20 office spaces that can be rented out to students with an initial contract of 6 months which can be extended for an additional six months. Thereby, the opportunity is provided to cooperate and become an ambassador for the organisation. By renting out offices, Venture Lab intends that students continue with their business ideas afterwards, for instance with further support from Ideon Innovation or LIFT.

Incubator: Ideon Innovation

Ideon Innovation, as the oldest and biggest of the five incubators, was established in 1993 as a "business incubator that helps entrepreneurs to build growing companies more quickly" (see <http://www.ideon.se/en/entrepreneurship/>; <http://www.ideoninnovation.se/>). As a result, Ideon Innovation is located between the university and the business sector by focusing on start-ups

and entrepreneurs. Hereby, no emphasis on a specific industry is set. Ideon Innovation does not per se focus on students: Approximately one-third of the presented business ideas are developed by students, one-third of the ideas originate from researchers and the remaining one-third have their sources outside of the university. Ideon's supporting activities include – besides financial support – renting out space for offices by real estate companies and enabling a meeting facility for (potential) entrepreneurs. Further support encompasses business advice, assistance in writing business plans and preparing pitches, as well as getting in contact with business angels, business partners or possible investors.

The incubator Ideon Innovation can be split up into three different parts. First, "Ideon Innovation" serves as a meeting facility for (potential) entrepreneurs with innovative business ideas. Second, "Ideon Growth" is targeted at small and medium enterprises aiming to grow. Third, "Ideon Open" is set up for large enterprises with a turnover of at least 100,000 SEK. Ideon Innovation receives 60 per cent public funding and 40 per cent private funding while Ideon Growth obtains equal amounts of public and private funding. Ideon Open is mostly funded by private sources. With regard to the funding, one interviewee mentioned that start-ups are an area of high interest for the Swedish government with national programmes for incubators being in place and public funding largely being provided from national funding or counselling funding.

In terms of entrepreneurship education, Ideon Innovation cooperates with LU by offering guest lectures on entrepreneurial topics within Master courses at SKJCE (e.g. on how to approach large corporations) and within PhD courses at SKJCE (e.g. on how to pitch or how to develop a business model) (see section 1.2). Moreover, Ideon Innovation is a member of FENA's steering group (see section 1.3). It also stays in direct contact with innovation departments from different faculties, such as the Chemistry Centre to assist in finding partners to commercialise business ideas. If requested by industry needs, students are contacted by Ideon Innovation. One example in this respect is Demola, a Finnish concept for innovation between students and industry partners that is further employed in Sweden, Estonia and Hungary. Thereby students are incorporated in projects that aim at creating innovative solutions or concepts for real-world companies or organisations (see <http://southsweden.demola.net/>).

Incubator: The Creative Plot (TCP)

The Creative Plot (TCP) is the newest of the five incubators in Lund (see <http://thecreativeplot.se/en/>). TCP is located in IDEON Science Park due to the regional proximity to students, the university and the network of incubators. The incubator was established out of an initiative by Lund municipality in 2011 as the first incubator with a direct focus on the cultural and creative sector. The idea behind its establishment is to help the cultural and creative sector to become more sustainable and innovative by fostering entrepreneurial mindsets and behaviour. Thereby, it is desired that through cross-fertilisation, the business sector and the cultural sector can learn from one another and engage in mutual exchange and collaboration to foster innovation.

Tailored support to entrepreneurs is provided through a coach that gives strategic and operative assistance through access to resources and by using his or her network to match the entrepreneur with funders or business partners. In addition, TCP provides office spaces, knowledge building activities, financial funding for start-ups as well as assistance in public relations and communication. TCP coaches between three to five companies from the cultural and creative sector simultaneously. Examples of start-ups that have been selected for support by TCP include "DIIZ Access AB", a design company that uses graphic design in order to create fashion accessories (see <http://diiz.se/>); "Marappo AB", a jeans brand that produces its jeans locally in Sweden; and "PipeDream Production", a production company that "delivers music theatre, shows, events and stage technology for local companies and individuals" (see <http://pipedream.se/>). Funding for TCP originates mostly from Lund municipality next to additional external funds by Relevex Funding and the European Union.

While not being formally integrated into entrepreneurship education at LU, TCP nonetheless remains closely connected with LU by being involved in entrepreneurship education through its collaboration with SKJCE and Venture Lab. Dialogue between business, academia and the cultural and creative sector is encouraged by TCP through "activities and projects aimed at creating meeting spaces and opportunities for these sectors to converse, work together, exchange ideas and knowledge and to learn from each other". One example in this context is a design project called "Moka" where TCP encourages students to participate (see

<http://mokaproject.com/about/>). TCP provides work space in its offices for students in order to work on entrepreneurial projects and organises workshops, seminars and networking events in the field of entrepreneurship that are also targeted at students.

Science and Technology Parks

Parts of LU and SKC are located in Lund, in direct proximity to the **IDEON Science Park**, which was formed in 1983 as one of the first science parks worldwide (see <http://www.ideon.se/en/about-ideon/>). The park is run by Wihlborgs Fastigheter AB, LU and Lund Municipality. It is Scandinavia's largest and most dense science park with 120,000 square metres of office space. Around 350 companies with approximately 2,700 employees are located in the park itself and 450 in the wider area. Since its start in 1983 more than 900 companies have operated in IDEON Science Park. Most of these companies are specialised in the high tech sector and have been formed as a result of research activities at LU.

For entrepreneurship education at LU, the park is of the utmost importance since numerous educational activities take place in facilities within IDEON Science Park. Office space within the science park can be obtained by students working on entrepreneurial projects, such as Master Students from the NVC track (see section 1.2). Local networking events, such as Tuesday Breakfast, are offered within the science park (see above). Close collaboration with the incubators, for instance in the alignment of events, is also fostered through the proximity within IDEON Science Park.

13.5.3. International relationships

In general, it can be stated that LU is a highly international university with the highest percentage of international students in Sweden and more than 680 partner universities in over 50 countries worldwide. Out of the 2,200 freestanding courses at LU, roughly 500 are taught in English to attract foreign students. 5 undergraduate and 100 Master's degree programmes are entirely provided in the English language. Furthermore, LU is the only Swedish university to be a member of the international network "League of European Research Universities and Universitas 21".

13.6. Impact and lessons learned

13.6.1. Evaluating impacts of the entrepreneurship education approach

Impact and Transferability of Entrepreneurship Education to other Universities

According to statistics provided by LU on its innovation outcomes in 2013, 110 new innovation ideas and 56 projects have been generated. Furthermore, 27 patent applications have been conducted and 14 companies were formed out of which 5 were holding companies with LU as part-owner. The University's innovation system has invested in more than 70 companies that have generated above 2,500 jobs and over 700,000,000 SEK in tax revenue since 1999.

In terms of SKJCE, approximately 350 students are educated yearly. In particular its MPE has received substantial interest from European and Asian universities. Competition for the Master's Programme is fierce with about 900 applicants in 2014 (1100 in 2015) for a total of 45 placements (see section 1.2).

SKJCE are currently involved in three different projects where knowledge of entrepreneurship education is transferred. The first is an EU project within the Tempus framework, where there is a co-operation with 9 Ukrainian universities as well as partnerships with universities from Porto, Gdansk, and Coventry. The second one is a co-operation with ESAMI in Arusha, Tanzania, where SKJCE is assisting in the development of an entrepreneurship programme. The third one is an education programme related to the preconditions for entrepreneurship development for Indonesian higher education ministry, university professors, and Ristek officers.

13.6.2. Lessons learned

Summary of lessons learned from this case

One key lesson learned from this case is that embeddedness into the local context with a supportive environment can be of utmost importance for the success of entrepreneurship education. At LU students do not solely receive excellent entrepreneurship education but are also provided with an enormous support environment for nascent entrepreneurs through funding, coaching or mentoring. These supporting environments can serve as an encouraging factor for the formation of student start-ups. Besides receiving an understanding of entrepreneurial concepts, training of entrepreneurial skills and behaviour is offered at Lund through entrepreneurial competitions or practical projects. Some of these curricular and extra-curricular activities take place within IDEON Science Park. This proximity of the educational stakeholders facilitates close collaboration between actors from the entrepreneurial ecosystem and frequent exchange of best practices.

However, one challenge that could simultaneously be observed is that although supportive, embedded entrepreneurial ecosystems are in place in Lund, innovative business ideas from students with a high rate of success remain nonetheless, relatively rare. Most of these ideas instead stem from researchers. Simultaneously, students do not make use of the entrepreneurial offers and support provided to the fullest extent possible. The problem might therefore not directly be a lack of ideas, but a lack of entrepreneurs. According to one interviewee, it might at times be difficult to motivate students for entrepreneurship and integrate them into voluntary educational offers. Students might take the potential support for granted and need to be provided with incentives for engagement in entrepreneurial actions on a voluntary basis. Entrepreneurship and entrepreneurial behaviour from students has to be further encouraged at universities by creating more awareness and a deeper understanding of entrepreneurship. The connection between students and researchers could be deepened to encourage such entrepreneurial behaviour. Possible benefits of an entrepreneurial career to students could be further highlighted to encourage active involvement, to deepen the entrepreneurial spirit and to prepare students for an entrepreneurial career. Moreover, reluctance to grow for established start-ups can be observed regularly in Sweden. This is another factor which could be addressed through entrepreneurship education via the integration of matters such as fear of failure and aversion to risk-taking in an entrepreneurial context (e.g. through story telling from successful entrepreneurs).

As stated by one interviewee, a change in mindset to overcome barriers to entrepreneurship is particularly needed for Swedish students from the cultural and creative sector where entrepreneurship at times has a negative connotation. Entrepreneurial minds were pointed out by interviewees as being essential for companies from all sectors in the future. Some students from the cultural and creative sector use services like TCP but they are often not receptive from the start, since many of them consider entrepreneurship as “anti-social” and “wrong”. In the creative sector, a mismatch between education and the real world can be observed with common employment difficulties (e.g. fashion studies). This gap could be bridged by supplying skills and capabilities to think entrepreneurially through an increase in tailored entrepreneurship education offers for the cultural and creative sector.

List of Abbreviations

CEI	Corporate Entrepreneurship and Innovation Master Programme
LSI	Life Science Incubator
LU	Lund University
LUIS	Lund University Innovation System
LUSIC	Lund University Social Innovation Center
MPE	Master’s Programme in Entrepreneurship
NVC	New Venture Creation Master Programme
SEK	Swedish Krona
SEM	School of Economics and Management

SKJCE Sten K. Johnson Centre for Entrepreneurship

TCP The Creative Plot

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Research for this case study was conducted by Kathrin Bischoff, Research Associate at the University of Wuppertal, with support from Eva Monschau, Research Assistant at the University of Wuppertal, on behalf of the study for supporting the entrepreneurial potential of higher education (sepHE). Sources and references used include desk research plus:

Interviews

Prof. Hans Landström, Professor in Entrepreneurship at Sten K. Johnson Centre for Entrepreneurship, School of Economics and Management, Lund University, interviewed via the phone on the 16th of June, 2014.

Prof. Marie Löwegren, Director of Sten K. Johnson Centre for Entrepreneurship, School of Economics and Management, Lund University, interviewed via the phone on the 22nd of August, 2014 and in person on the 22nd of September, 2014.

Mats Dunmar, Manager Ideon Open, interviewed in person on the 22nd of September, 2014.

Hanway Tran, Head of Finance at FENA, interviewed in person on the 23rd of September, 2014.

Mikaela Färnqvist, Project Leader at Venture Lab, interviewed in person on the 23rd of September, 2014.

Debora Voges, Project Leader at Creative Plot, interviewed in person on the 23rd of September, 2014.

Fredrik Andersson, Dean of School of Economics and Management and Kristina Eneroth, Pro-Vice Chancellor of Lund University, interviewed in person on the 23rd of September, 2014.

Julia Selander, Regional Manager of Venture Cup, interviewed in person on the 23rd of September, 2014.

Lottie Olsson Norrsén, External Relations of Sten K. Johnson Centre for Entrepreneurship, School of Economics and Management, Lund University, interviewed in person on the 24th of September, 2014.

Sven Olsson, Business Developer at LU Innovation System, interviewed in person on the 24th of September, 2014.

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14. EMLYON, France: Educating entrepreneurs as a prime objective of a private business school

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Abstract



EMLYON is a private management school based in the city of Lyon in France. It is among the highest ranked business schools internationally. Since the mid-1980s EMLYON has been focusing on developing entrepreneurial mindsets among students and faculty members. Today there is an emphasis on entrepreneurship education (EE) in all academic programmes and other activities, closely linked with the EMLYON Incubator. Since 2004, the school's baseline is "Educating Entrepreneurs for the World". In line with the school's focus, a large number of teachers are involved in EE: ten professors are covering entrepreneurship extensively; another 30 to 40 are involved in EE. Several lessons can be learnt from the EMLYON case. First, entrepreneurship education appears to require a long-term strategy, continuity and persistence. Second, the strength of EMLYON's approach seems to be in diverse education, combining research, teaching, incubating, mentoring, coaching, and other activities, which together generate an entrepreneurial culture at the university. Third, a strong focus on entrepreneurship education may require continuous innovation in teaching. However, since EMLYON is a private business school with specific resources, its approach may not easily be copied by public sector universities.

Case study fact sheet

▪ Full name of the university, location:	Ecole de Management Lyon (EM Lyon), Lyon, France
▪ Legal status:	Private
▪ Campuses:	Three campuses : Lyon-Ecully Campus, Saint-Etienne Campus (France) and Shanghai Campus (China)
▪ Year of foundation:	1872
▪ Number of students (year):	2014: 2,800 students in Graduate Programmes 5,500 participants per year in Executive Education Programmes
▪ Number of employees:	104 permanent professors (http://www.em-lyon.com/en/faculty-research-education)
▪ Budget in most recent financial year:	2011/12: 50 million euro (According to Annual Report 2012)
▪ Academic profile:	EMLYON has four academic departments: Markets and Innovation; Strategy and Organisation; Economics, Finances and Control; Management, Law and Human Resources. EMLYON is one of the highest-ranked business schools internationally – examples: N°10 MBA in the world for entrepreneurship (Financial Times, Jan. 2014); N°13 European Business School (Financial Times, Dec. 2013); N°1 French Business School Incubator (L'Entreprise, Nov. 2013)
▪ Entrepreneurship education profile:	University Motto: "Educating entrepreneurs for the world"
▪ Activities focused in this case study:	Seamless EE at an "entrepreneurial university" that has a strong profile not only in entrepreneurship teaching but also in entrepreneurship research, internal knowledge transfer from such research, and an entrepreneurial organisation of the university
▪ Case gatekeeper:	Prof. Dr. Alain Fayolle, Professor in Entrepreneurship,

<i>EMLYON</i>

Information included in this case study is from end of year 2014 unless stated differently.

14.1. The university's entrepreneurship education profile

14.1.1. The university's overall approach to entrepreneurship education

EMLYON's overall profile

EMLYON is located in the City of Lyon in east-central France, department of Rhône-Alpes.²²⁷ Lyon has almost 500,000 inhabitants and is the third largest city in France. In contrast to most other full universities covered by the sepHE study, EMLYON is a private management school (Ecole de Management). It was established in 1872 by the Lyon Chamber of Commerce and Industry and is still affiliated to it.

EMLYON is one of the highest ranked business schools in France, Europe and the world. Exemplary rankings include the following: N°10 MBA in the world for entrepreneurship (Financial Times, January 2014); N°13 European Business School (Financial Times, December 2013); N°1 French Business School Incubator (L'Entreprise, November 2013).

EMLYON's overall approach to entrepreneurship education

Since the mid-1980s EMLYON has been focusing on developing entrepreneurial attitudes and entrepreneurial mindsets among students and faculty members. Today there is an **emphasis on entrepreneurship education (EE) in all academic programmes and other activities**. Entrepreneurship-related teaching activities target students at Bachelor, Master, Master of Business Administration (MBA), Executive Master of Business Administration (EMBA) and PhD levels. EMLYON Business School is also engaged in international entrepreneurship projects: Global Entrepreneurship Monitor (GEM)²²⁸, Global University Entrepreneurial Spirit Students' Survey (GUESSS),²²⁹ and Successful Transgenerational Entrepreneurship Practices (STEP)²³⁰. EMLYON is also running several incubators and organises the World Entrepreneurship Forum²³¹ each year.

Reflecting its shift towards focusing on entrepreneurship, in 2004 the baseline of the school changed and became "Educating Entrepreneurs for the World". This vision and mission also relates to entrepreneurs within companies, with respect to owner entrepreneurs, and with respect to social entrepreneurs. In the words of EMLYON professor Pablo Martin de Holan: "Entrepreneurship goes far beyond starting your own company. Entrepreneurship is about detecting and transforming opportunities and creating value for you, for firms and for whole communities."²³² The idea behind this outlook is to teach students why and how it is important to produce and distribute wealth. EMLYON covers the aspect of distribution by teaching social responsibility and business ethics.

EE at EMLYON is closely linked with the "Incubateur EMLYON" (EMLYON Incubator)²³³ which used to be called "entrepreneur centre", established in 1984.

At the core of EMLYON's approach to EE is its **philosophy of "Pedagogical Innovation"**. It involves the idea that students are responsible for developing "their own learning projects in line with their ambitions, their talents and motivations", supported by EMLYON faculty.²³⁴

14.1.2. Leadership and governance

Importance of government strategies

The case study did not identify particular influences from the national or regional government on EMLYON's approach to and practices of entrepreneurship education. The university's board does not include members from government.

²²⁷ EM is the abbreviation of the French term "Ecole de Management", i.e. Management School.

²²⁸ See <http://www.gemconsortium.org>.

²²⁹ See <http://guesssurvey.org>.

²³⁰ See <http://www.babson.edu/Academics/centers/blank-center/global-research/step/Pages/home.aspx>.

²³¹ See <http://www.world-entrepreneurship-forum.com/>.

²³² Quoted from Global Entrepreneurship programme brochure, p. 2.

²³³ See <https://emlyonincubateur.wordpress.com>.

²³⁴ See <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/Pedagogical-Innovation>.

Importance of entrepreneurship in the university's strategy

At the core of EMLYON's mission and vision is the following statement: "Educating Entrepreneurs for the World is at the heart of everything we do at EMLYON", which would then be capable of creating new wealth, value and social justice.²³⁵ EMLYON further argues that its "distinctive quality is founded on teaching innovation and an entrepreneurial approach to management education"²³⁶. At the basis of the EMLYON approach is the idea to encourage students to take initiative and thus to turn ideas into practice. Students are to work in teams with an aspiration to accomplish things, which would then grow into high potential start-ups, high-growth companies, dynamic organisations and revitalised corporations.²³⁷

Hence, EMLYON's mission statement refers directly to entrepreneurship and entrepreneurship education: "EMLYON is a European Business School devoted to **lifelong learning for entrepreneurial and international management**. Its entrepreneurial and educational project consists of stimulating the social responsibility of its participants, thus giving them all the support needed to achieve business success in the various cultural and economic systems around the world. Its know-how in training is based both on theory and on day-to-day company management. Its distinctive quality is founded on teaching innovation and an entrepreneurial approach to management education."²³⁸

This mission and philosophy is supported by **six core values** which EMLYON seeks to impart:²³⁹ (1) Creative value, which involves lateral thinking, challenging conventions, problem-solving, inventions and innovations. (2) Responsible value, which includes taking responsibility and a sense of social justice. (3) Empowering value, which involves providing the tools people need to succeed. (4) Inspiring value, which involves the creation of opportunities for EMLYON's people, thinking big, as well as motivating and invigorating people. (5) Bold value, which involves the courage of our convictions. (6) Genuine value, which involves being authentic and sincere.

Extent of high level commitment to implementing entrepreneurship

EMLYON's commitment to entrepreneurial education is supposed to transcend all of its educational activities. While initially emerging from the ideas of entrepreneurship experts, all levels of the business school were found to be firmly committed to the university's strategy.

Level of faculties' and units' autonomy to act

Since EMLYON's strategic target is supporting entrepreneurship and EE, there may be no particular difficulties to introduce new courses or methods in EE at the school.

Organisational implementation

In terms of the school's governance structures, there are several research centres active in the field of entrepreneurship. The most important ones are the Centre for Entrepreneurship and Centre in Economics and Finance which deals with entrepreneurial finance research. The EMLYON Incubator plays a crucial role in the university's entrepreneurship education (see section 1.4.1 for details).

Against the background of a large number of activities related to entrepreneurial education, one of the challenges that the management school was facing in 2014 was related to co-ordination and communication. EMLYON addressed the co-ordination and communication challenges through a mix of solutions; firstly, a formal structure of committees and; secondly, informal co-ordination through a strong corporate identity and related organisational culture, in which members of the organisation anticipate useful activities for the organisation.

The case study also found that successful innovation in entrepreneurial education at EMLYON very much depends on individual initiatives and how the institutional environment supports such individual initiatives. The interviews gave the impression that potential envy or even hostility

²³⁵ See <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/Who-we-are>.

²³⁶ See <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/Who-we-are/european-business-school-missions>.

²³⁷ See <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/Who-we-are/european-business-school-missions>.

²³⁸ See <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/Who-we-are/european-business-school-missions>.

²³⁹ See <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/Who-we-are/european-business-school-missions>.

from colleagues and administrators, manifesting in participative decision-making structures and bureaucratic procedures, may hinder the implementation of novel ideas. It appears that some initiatives see the light of day only because of a supportive combination of surprise (i.e. potential opponents not noticing the initiative), luck and management support.

University's importance for driving entrepreneurship in its environment

Through its activities, EMLYON seeks to drive forward the idea of entrepreneurship not only in its local and regional geographical environment, but also at the national and international level. EMLYON can be considered as a major supplier of entrepreneurs.

14.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

In line with the university's strong focus on entrepreneurship, a large number of internal staff and external lecturers are involved in EE. In terms of human resources, around ten professors from different departments were covering different aspects of entrepreneurship education in their teaching and research activities in 2014, although their chair was not explicitly focusing on entrepreneurship. In addition, 30 to 40 internal and external lecturers were involved in entrepreneurial education.

Financial resources for entrepreneurship education

In the framework of the case study it was not possible to identify the financial resources spent on EE activities at EMLYON.

14.2. Entrepreneurship in curricula and teaching

14.2.1. Overview about curricular offers

EE covering all degree programmes

At EMLYON, curricular offers in EE cover all current students, ranging from Bachelor to Master, PhD, MBA, and executive MBA levels. EMLYON in France – i.e. excluding programmes in Asia and Africa – offers seven types of major programmes:

- **Bachelor Programme** (BBA EMLYON).
- **PhD Programme.**

The following programmes include specialisations. Some sub-programmes are available in several major programmes:

- **Graduate Programmes:** MSc in International Hospitality Management; MSc in Management; European Master in Management; Programme I.D.E.A - taught in French; Global Entrepreneurship Program; MSc in Sports Industry Management; MSc in Luxury Management & Marketing.
- **Specialised Masters Programmes:** Finance & Banking Range; Technology & Innovation Range; Marketing, Management & International Range.
- **MBA Programmes:** International MBA Full time; Executive MBA Part time; Railway Global Executive MBA.
- **Executive Development:** Advanced Management Programme/CPA; Executive MBA; Railway Global Executive MBA; Programme Général de Management (PGM); Diriger Une Activité (DUA); Objectif Administratrice; Transformation RH & Coaching; Open programmes; Corporate Solutions.
- **Programmes for entrepreneurs:** Programme I.D.E.A - taught in French; Global Entrepreneurship Program; Specialised Master Entreprendre; Advanced Management Programme/CPA; Start-Up/Relève Programme-Taught in French; Programmes d'accompagnement-Taught in French.

Each of the programmes includes at least one entrepreneurship course unit. Exhibit 14-1 includes an overview of selected offers.

Exhibit 14-1: Overview about prominent curricular EE offers at EMLYON

Name of course, degree	Objectives / specification	Target groups
Bachelor		
Business Game Simulation	Developing a sense for entrepreneurial initiatives	First-year bachelors
Innovation Project	100 hours course, developing entrepreneurial mindsets and including the development of a new venture project	Second-year bachelors
Graduate (example)		
Global Entrepreneurship Programme	Exemplary courses: Introduction to Entrepreneurship, Entrepreneurship and New Venture Creation, Finance for Entrepreneurs, Introduction to Intrapreneurship	First trimester students of the Global Entrepreneurship Programme
Global Entrepreneurship Programme	Exemplary courses: Social Entrepreneurship, Change Management for Entrepreneurs, Managing Growth for Entrepreneurs	Third trimester students of Global Entrepreneurship Programme
Specialised Master (example)		
MSc Entreprendre	Exemplary course: Entrepreneurial diagnosis and decisions	First-month students of MSc Entreprendre
MSc Entreprendre	Mutation of "internal start-ups" in large organisations, Business acquisition and take-over of family enterprises	Fifth-month students of MSc Entreprendre
MBA (example)		
International MBA	Entrepreneurial Leadership Project (ELP): nine-month team-based consulting project that corresponds with participant ambitions	International MBA students
PhD		
PhD programme	Foundations of Entrepreneurial Thinking (24 h, Alain Fayolle)	First year PhD programme students
PhD programme	Entrepreneurs and Democracy (12 h, Pierre-Yves Gomez)	Second year PhD programme students
PhD programme	Social Entrepreneurship (12 h, Ignasi Martí Lanuza)	Second year PhD programme students

Bachelor-level programme

The **bachelor programme** EMLYON BBA (Bachelor in Business Administration) is a four-year course of study that is, according to the programme description, "all about preparing future entrepreneurs"²⁴⁰. The programme is focussed on preparing for operational management and includes at least one element of entrepreneurship education in each year. For second year students, the new international bachelor programme is offering a 100 hours course titled "Innovation Project". This course aims, among other objectives, at developing an

²⁴⁰ See <http://bba.em-lyon.com/eng/>.

entrepreneurial mindset and including the development of a new venture project.²⁴¹ The PCE (Projet de Création d'Entreprise) is a compulsory programme for third year bachelors.

Graduate programmes

EMLYON offers seven graduate programmes. For example, the **Global Entrepreneurship Programme** supports students in becoming a "global entrepreneur" across different cultural and business environments. The Global Entrepreneurship Programme is a twelve-month, full-time programme taught in English. It involves a semester-long consulting project for a local company with students from other countries. The programme is a double degree programme between EMLYON Business School and Purdue University's Krannert School of Management (USA) and run jointly by EMLYON, Zhejiang University (China) and Purdue University (USA). They form a consortium of international business schools of recognised experts in global entrepreneurship.²⁴²

There are also components of entrepreneurial education included in non-specialist master programmes. For example, during the first semester of the **MSc in Management**, students will work on the New Venture Creation Basics Project, creating a virtual company. Students are introduced to and experience the entire entrepreneurial process, turning ideas into a business plan and then reaching out to the business world to receive feedback. A team of faculty members accompanies students in this project, providing both the support and the guidance needed to make the projects a success.²⁴³ Working on the New Venture Creation Basics Project is supposed to help students gain first-hand experience in turning an idea into tangible value, and to help develop the entrepreneurial mindset that is assumed to be key to future success. Furthermore, the programme offers twelve months of internships in international companies.²⁴⁴

The **I.D.E.A.** platform is a graduate programme taught in French.²⁴⁵ IDEA is the acronym of "Innovation, Design, Entrepreneurship and Arts". It is a joint master-level course delivered by EMLYON and Ecole Centrale Lyon²⁴⁶, a local institution of higher education focusing on engineering education. Its aim is to train entrepreneurs who are leaders in innovation, making the most of globalisation while driven by people-oriented values and appreciating the importance of sustainable development. In 2012, EMLYON Business School and Ecole Centrale de Lyon won the "excellent initiatives in innovative training" (IDEFI) call for projects, which aims to support flagship innovative higher education projects. The schools received a 6.3 million euro grant for their project, consisting of the I.D.E.A. Programme and the FabLab, the LearningLab and the I.D.E.A. System – the core elements of the project. At the FabLab, students design physical or conceptual models that express their product, service or system innovation ideas. The I.D.E.A. System operates within the EMLYON Incubator. It provides a support mechanism for I.D.E.A. Programme students with business start-up projects. The Incubator provides assistance from the outset of the entrepreneurship process, giving innovative entrepreneurs a support structure featuring a wide range of different systems²⁴⁷.

Specialised Master programmes

EMLYON offers specialised Master degree studies in the ranges of finance and banking, technology and Innovation as well as marketing, management and international issues. One of them is the **Master (MS) Entreprendre**, preparing students for becoming leaders in small and medium-sized businesses. Education design in this programme is based on three principles: (1) Acquisition of entrepreneurial competencies and command of multidisciplinary methods to launch/develop new initiatives. (2) Development of talents and entrepreneurial skills which are

²⁴¹ See <http://bba.em-lyon.com/>, <http://bba.em-lyon.com/programme-bachelor/formation-bac-4-management> <http://bba.em-lyon.com/programme-bachelor/formation-bac-4-management> <http://bba.em-lyon.com/programme-bachelor/cours-enseignement-bba>.

²⁴² See <http://graduate.em-lyon.com/en/Global-Entrepreneurship-Program>.

²⁴³ See <http://graduate.em-lyon.com/en/MSc-in-Management> and <http://graduate.em-lyon.com/en/MSc-in-Management/Programme/Learning>.

²⁴⁴ See <http://graduate.em-lyon.com/en/MSc-in-Management>.

²⁴⁵ See <http://masters.em-lyon.com/fr/Programme-I.D.E.A>.

²⁴⁶ See <http://www.ec-lyon.fr/centrale-lyon>.

²⁴⁷ See <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/Science-Business-Alliance> and <http://masters.em-lyon.com/fr/Programme-I.D.E.A>.

focussing on action. (3) Understanding the different contexts for entrepreneurial activities; large enterprises, SMEs, start-ups, family-owned businesses, and consulting.²⁴⁸

MBA programmes

EMLYON offers three programmes for Masters of Business Administration (MBA), which share the goal of helping students develop entrepreneurial leadership skills. The twelve-month full-time **International MBA** programme has a strong focus on entrepreneurship, and involves a nine-month consulting project. Amongst other things, the programme allows students to specialise in “new ventures”. It involves lessons from corporate and social intrapreneurs, as well as from entrepreneurs who started their own companies.²⁴⁹

PhD level programme

The **PhD** programme at EMLYON also emphasises entrepreneurship. Among others, the first year includes a course on “Foundations of Entrepreneurial Thinking”, while the second year includes courses on “Entrepreneurs and Democracy” and “Social Entrepreneurship”²⁵⁰.

Executive programmes

EMLYON offers a variety of executive programme, including for example, an Executive MBA. It prepares students for executive positions such as Vice President or Senior Vice President.

Programmes for entrepreneurs

A further non-academic programme targets **current entrepreneurs or practitioners** wishing to engage in entrepreneurial activities. For example, the Advanced Management Programme helps entrepreneurs to boost their company.²⁵¹ The programme “Start-Up/Relève” helps participants capitalise on their professional experience to develop a start-up model or take over a company that has already been started.²⁵²

14.2.2. Target groups

Main target groups of entrepreneurship education

Entrepreneurship education at EMLYON targets all students. In addition, since entrepreneurial education is a pivotal element of EMLYON’s branding and marketing strategy, it also targets all prospective students.

Continuous education

EMLYON offers a variety of seminars or courses in short-term and long-term executive programmes, for example the “Apprendre à Entreprendre”, which is a two-day introductory seminar for the PGM programme (Programme Général de Management).

Bridges to secondary education

EMLYON co-operates with a number of local and regional schools, for example engineering schools such as Ecole Centrale de Lyon, INSA, and CPE. Teaching activities mainly involve integrating engineering students in EMLYON’s entrepreneurship programmes.

14.2.3. Designing lectures and courses – basic curricular decisions

Objectives of entrepreneurship teaching

²⁴⁸ See semester-long consulting project for a local company with students from other countries, reinforcing teamwork on a global level and helping you acquire practical experience in addition to academic knowledge.

²⁴⁹ See <http://graduate.em-lyon.com/en/International-MBA>.

²⁵⁰ See <http://www.em-lyon.com/en/faculty-research-education/faculty-research/PhD-Programme/Programme-structure>.

²⁵¹ See <http://www.eml-executive.com/Nos-formations/Programmes-individuels/AMP-CPA>.

²⁵² See <http://www.em-lyon.com/en/Programmes/entrepreneurial-education/programmes-for-entrepreneurs/start-up-programme> and <http://www.em-lyon.com/en/Programmes/entrepreneurial-education/programmes-for-entrepreneurs/Programmes-d-accompagnement-Taught-in-French>.

The spirit of entrepreneurial orientation is meant to permeate all activities at EMLYON, including the design of lectures and courses, and other fundamental decisions related to education. The underlying philosophy is emphasising a holistic and supportive approach that is related to the people's individual aspirations, skills and abilities and other characteristics.

In return, at EMLYON, students cannot escape entrepreneurial education. Students in all courses are educated to become entrepreneurs. If they do not seek to set up businesses themselves, they are educated to become intrapreneurs within business organisations.

EMLYON's pedagogical approach

Central to EMLYON's approach to pedagogical innovation is the idea that entrepreneurial pedagogy should equip students with the ability to adapt, to innovate, to take risks, and to be open to the world. Instead of approaches based on learning from knowledgeable teachers, students are supposed to be the driving force behind their own learning project. This represents an uncommon way of learning, in line with the student's ambitions, their talents and motivations.²⁵³ Entrepreneurial pedagogy at EMLYON is based on the principles of being active, collaborative, systemic, open, reflective, and critical:²⁵⁴

- **Active** pedagogy, project-based and encouraging engagement, initiative and creativity.
- **Collaborative** pedagogy, encouraging teamwork and use of resource networks, e.g. with other students, teachers, graduates, and companies.
- **Systemic** pedagogy, breaking down barriers between disciplines in order to solve complex problems.
- **Open** pedagogy, exposing students to diverse cultures, skills, perspectives.
- **Reflective** learning, encouraging self-awareness, personal development and the ability to learn from experience.
- **Critical** thinking, encouraging the development of critical faculties and the ability to question the status quo.

In practice, the entrepreneurial pedagogy approach involves the following specific items:²⁵⁵

- An international, off-campus Bachelor Project,
- A team-based social sciences research project,
- Experiencing collaborative work through social networks,
- The creation of a collection of entrepreneurial case studies,
- A team-based Start-a-Company project,
- A group commando training session with the French Air Force Academy,
- Lessons designed to develop critical minds, open to issues such as controversial marketing, alternative management,
- The development of serious games and educational games,
- Cross-cultural experience through a semester in Shanghai and international internships and exchanges.

Methods and media

EMLYON uses a variety of instructional methods such as videos, case study analysis, and learning diaries. For example, the web-based course "Introduction to Entrepreneurship" is a blend of video-based lecture units, interactive virtual sessions, online forums and multi-choice assessment.

²⁵³ See <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/Pedagogical-Innovation>.

²⁵⁴ Mostly direct quotes from <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/Pedagogical-Innovation>.

²⁵⁵ See <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/Pedagogical-Innovation>.

One particularly innovative element of entrepreneurship education at EMLYON is the **Massive Online Open Course** (MOOC) on “Becoming Entrepreneur of Innovation through Design Thinking”.²⁵⁶ It is based on the pedagogy of the IDEA programme run jointly by EMLYON and L'École Centrale de Lyon. This means that the basic approach is the Design Thinking method. It addresses Master degree students. The MOOC has four presenters: Jean-Patrick Péché, responsible for design thinking at the IDEA programme; Fabien Mieyeville, Associate Professor at the l'École Centrale de Lyon and researcher at the Institute of Nanotechnologies at Lyon; Philippe Silberzahn, Professor for Entrepreneurship, Strategy and Innovation at EMLYON; and Renault Gaultier, co-founder of the IDEA programme. The course lasts over six weeks with six modules: (1) Innovation – why and how, (2) How to create state of the art technology beyond the benchmark, (3) How to define development axes and working hypothesis, (4) Researching solutions, (5) Integration and finalisation of the proposition, (6) Valorisation of the entrepreneurial project. The course is free of cost and open to anyone for registration. After successful completion, participants receive either a free certificate or they can obtain a certificate which involves an identity check but for which they have to pay. In its three editions, the course has attracted 18,000 participants.

EMLYON recently launched the innovative programme **European Entrepreneurial Journey** (EEJ) designed and taught by Prof. Alain Fayolle for EMBA students. EEJ is a five-month programme aimed at developing the ability to understand the role and influences of contextual variables in different European settings. Based on Fayolle's academic network, the EMBA students have to study an entrepreneurship-related issue in a given European country. To do this, each group composed of five students has to define an issue in relation to the entrepreneurial ecosystem in one European country. The 15 groups work on 15 different countries. They have to organise a three- or four-day visit to the country with the aim of meeting entrepreneurs, policymakers, venture capitalists, business angels, bankers, academics, and other network partners. They have to gather and analyse data to understand to which extent the contextual variables determine entrepreneurship policies, entrepreneurial behaviours and strategies in relation to entrepreneurship. The students have to regularly make presentations facing the other groups and sharing the results of their analysis with them. They are supervised by an EMLYON professor. In addition, in each country there is a facilitator from Fayolle's academic network who helps the students to get in touch with the entrepreneurship stakeholders in each country.

Evaluation of learning outcomes and feedback for students

As regards assessment of students' learning advancement, EMLYON uses rather traditional approaches, which includes monitoring the improvement of knowledge as well as the development of entrepreneurial skills. Amongst others, students are expected to use a teaching journal, where they have to take time and answer basic questions in order to reflect upon the learning process for each and every session. Additional elements for students' assessment include case study analysis and multiple-choice tests.

14.2.4. Setting of entrepreneurship teaching

Locations and timing

The entrepreneurial teaching activities are located in the business school and usually take place during the day, and sometimes on Saturdays. Many programmes involve internships in companies as well as learning and working abroad.

Formal evaluation of learning outcomes

Faculty members are mentoring and monitoring the external lecturers on the programme. In addition, there is also a systematic student evaluation of each teaching event. External lecturers play a major role when it comes to the supervision of student projects, as part of the curricular activities. The coaching and mentoring process is divided between professors, entrepreneurs and consultants.

²⁵⁶ See <http://www.unow.fr/index.php/mooc-idea>.

14.2.5. Instructors: teachers and mentors

Professors, other employees and external lecturers of the university

Currently, there are ten professors teaching courses related to entrepreneurial education, although they are not specifically designated professors of entrepreneurship.

"Real entrepreneurs" as teachers

EMLYON involves representatives from various business backgrounds directly in EE activities. Specifically, EMLYON regularly invites entrepreneurs into the classroom. Some selected examples include:

- *Enterprises:* The CEO-owners of entrepreneurial firms deliver lectures and interact with the students, for example of Ad Vinam Aeternam (a wine service provider), Prismaflex (an advertising products manufacturer²⁵⁷) and Laureats Informatique (Laureats Informatique, a software company).
- *Financial institutions:* Philippe Mere, Banexi Ventures (venture capitalist), Didier Bernard (business angel) and Didier Tranchier (business angel) give lectures and interact with the students.
- *Support services:* Nathalie Carre (CCI de France), Romaric Cuzin (CCI de Lyon), Ulrich Schmidt and Philippe Garcin (Réseau Entreprendre) give lectures and interact with the students.

The directors of Region Rhône-Alpes incubators, the region where EMLYON is located in, give lectures on their activities and interact with the students.

The undergraduate course "Introduction to Entrepreneurship" for first year students involves 60 contact hours over a period of ten to twelve days and is organised around the project of developing and designing a business plan. The 560 students are taught and co-ordinated by a pedagogical team of academics and entrepreneurs. Within the framework parameters of the course established by the course coordinator, the lecturers have a certain degree of discretion. The pedagogical team of 14 people meets on a weekly basis.

EMLYON also seeks to train and help selected entrepreneurs to turn them into "academic entrepreneurs", i.e. contracting them with EMLYON while maintaining their entrepreneurial business activity.

14.2.6. Management of entrepreneurship education

EMLYON has a **decentralised co-ordination of EE activities**; there is no specific entity for co-ordination. The programmes, professorial chairs and units (such as the incubator) are rather autonomous. However, the broad range of EE activities across different departments, chairs and other organisational units such as the incubator requires a high degree of organisational capability to manage complexity. The range of activities is managed through a system of programme committees and the management board.

With respect to "**teaching the teachers**", the entrepreneurship lecturers do not receive any formal training. However, they are carefully selected – for example with respect to previous teaching performance – and then coached on the job during the teaching and learning process. The performance of the trainers is assessed on the basis of student feedback, feedback from other tutors as well as self-reflection and self-assessment. Furthermore, EMLYON has a learning laboratory which plays an important role in providing continuous general training for the teachers. Specifically, in entrepreneurship, EMLYON trains some entrepreneurs to develop abilities in teaching entrepreneurship. EMLYON has also designed and taught seminars to train entrepreneurship teachers at the national level under the umbrella of the Fondation Nationale pour L'Enseignement de la Gestion des Entreprises (FNEGE). EMLYON also runs related activities in Tunisia.

EMLYON is in the process of designing a two-day workshop for entrepreneurs to introduce them to teach at EMLYON.

²⁵⁷ See <http://www.eml-executive.com/en/About-EML/News-Events/EML-News/News/30th-anniversary-of-the-EMLYON-Incubator-1984-2014>.

External lecturers, such as guest professors, entrepreneurs and consultants, are supervised through a mentoring and coaching system. There are discussions before a particular course unit and reflections afterwards.

14.3. Extra-curricular activities related to entrepreneurship education

EMLYON offers **three major extra-curricular activities** in the field of entrepreneurship education, all in the form of student organisations: The Junior World Entrepreneurship Forum, EMicrocrédit which is focusing on microfinance and social entrepreneurship, and Junior Conseil, a consulting agency. The management school strongly encourages students to participate in these activities.

The **Junior World Entrepreneurship Forum (JWEF)** is linked to the World Entrepreneurship Forum (WEF), which was created by EMLYON Business School and KPMG France in 2008.²⁵⁸ Since then, ACE Action Community for Entrepreneurship, Nanyang Technological University (Singapore), ONLYLYON and Zhejiang University (China) have joined as supporters. The WEF is a global entrepreneurial ecosystem which includes entrepreneurs, social entrepreneurs, policy makers, experts and academics from five continents.²⁵⁹ The JWEF aims to represent the youth version of the WEF, in line with the World Entrepreneurship Forum's mission to "promote and accelerate junior entrepreneurship globally as a way to create wealth and social justice, to prepare the world of 2050". JWEF is organised by a student association. It organises local or national events held all over the world, bringing together students and young entrepreneurs from various backgrounds. JWEF events usually focus on topics discussed at the World Entrepreneurship Forum, last for two to four days and intend to promote and accelerate youth entrepreneurship through inspirational talks, impacting workshops and networking sessions.²⁶⁰

EMicrocrédit²⁶¹ was established in 2008 as an organisation of EMLYON students. In 2014, about 20 students were organising micro-credits to (co-)finance the projects of (social) micro-entrepreneurs in foreign countries.

EMLYON Junior Conseil²⁶², established in 1972, is the junior enterprise of the EMLYON management school. It draws on 40 project managers and more than 450 students involved in its activities. It is one of the oldest junior enterprises in France and the first one to be certified according to ISO 9001 standards in 1999.

These extracurricular activities are complementary to the curriculum, i.e. they provide opportunities for transferring the skills acquired in curricular EE activities to real life situations. However, while supported by EMLYON, these extra-curricular activities are not content- or assessment-wise linked to the curriculum.

14.4. Institutional aspects of entrepreneurship education

14.4.1. Organisational set-up and change

Measures for coordinating and integrating entrepreneurship education across the university

There is a **system of committees** at EMLYON co-ordinating all teaching activities, including the ones related to entrepreneurial education.

EMLYON's **executive committee** is composed of a Dean, a Vice-President, a Corporate Resources Director, a Vice-President Dean of the Faculty, a Vice President for Research, an Academic Affairs Director, and a Talents and Identity Director.²⁶³ Thus, the executive committee

²⁵⁸ See <http://junior.world-entrepreneurship-forum.com/> and <http://www.world-entrepreneurship-forum.com>.

²⁵⁹ See <http://www.world-entrepreneurship-forum.com/About-us/Vision-Mission>.

²⁶⁰ See <http://junior.world-entrepreneurship-forum.com/about-the-jwef-promote-and-accelerate-youth-entrepreneurship>.

²⁶¹ See <http://www.emicrocredit.com/>.

²⁶² See <http://www.emlyonjuniorconseil.com/>.

²⁶³ See <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/Who-we-are/business-school-governance>.

does not have specific positions for entrepreneurial issues such as a “Vice President for Entrepreneurship”. All members of the executive committee are expected to support entrepreneurial teaching, behaviour and thinking, in accordance with the university’s baseline.

There are also several **programme committees** in which entrepreneurial activities are co-ordinated and monitored. However, due to the large number of activities across different areas of the school, describing the system in more detail is beyond the scope of this case study.

EMLYON Incubator

The EMLYON Incubator²⁶⁴, which is a part of the university, plays a crucial role in the university’s entrepreneurship education. It was established in 1984 as a “Centre for Entrepreneurs” and rebranded in 2008 as “EMLYON Business School Incubator”. EMLYON considers the incubator as a major part of the regional, national and even international innovation and entrepreneurship ecosystem. The Incubator provides assistance from the outset of the entrepreneurship process, giving innovative entrepreneurs a support structure featuring a wide range of different services. It also provides multiple opportunities to meet and network with established decision-makers and entrepreneurs.

The EMLYON Incubator supports two types of projects: Firstly, projects by students and alumni of EMLYON and Central Lyon, as well as higher education institutions from the Lyon-Saint-Etienne conglomerate. Secondly, innovative projects from the region, with no specific link to EMLYON required.

In line with current and future economic challenges, the EMLYON Incubator supports three types of entrepreneurial projects:

- Business start-up projects in the high-tech, service and social economy sectors;
- Business takeovers by another company, an employee or a member of the founding family;
- The development of a new business line within an existing company, in start-up mode panel.

Influence of external stakeholders

External stakeholders are represented in EMLYON’s Board of Governors.²⁶⁵ The Board includes, among others, six representatives of the Lyon Chamber of Commerce and Industry, four business partners, two Independent Directors from business, and to representatives of the EMLYON alumni association who are also from business. There is thus a very strong representation of business perspectives in the Board.

14.4.2. Laws, statutes and codes

Regulations governing EE at EMLYON

There are no specific laws or university regulations governing entrepreneurship education at EMLYON. Rather it was found that the culture of the school was apparently exerting pressures and providing incentives in terms of status and recognition. The entrepreneurship-oriented organisational culture at EMLYON was found to potentially lead to a self-selection of those applicants for professorships with an affinity towards entrepreneurial education.

Incentives for staff to engage in or support entrepreneurship education

During an interview for this case study, Prof. Alain Fayolle mentioned that there were no specific incentives – financial or other – for faculty to engage in entrepreneurial education. However, professors engaged in entrepreneurial activities would de facto have a higher teaching load because of their close involvement with students and the higher intensity of supervision. Although not recognised by any workload allocation model, the higher degree of involvement of these members of staff may display a higher level of intrinsic motivation to become involved in EE.

Incentives for other stakeholders contributing to entrepreneurship education

²⁶⁴ See <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/EMLYON-Incubator>.

²⁶⁵ See Annual Report 2012, p. 3.

Local stakeholders such as the Lyon Chamber of Commerce and Industry, local companies and educational institutions may have an interest to contribute to EE. They may perceive entrepreneurship as a driver of economic development and growth, closely linked to company start-ups and the supply of skilled labour.

14.4.3. Mindsets and attitudes

Raising awareness for the importance of entrepreneurship

EMLYON was found to very much embody entrepreneurship education: EE activities exist in all educational programmes, is the focus of EMLYON's mission and vision, and reflects EMLYON's positioning in the higher education market. Due to EMLYON's internal and external marketing activities, e.g. with respect to student recruitment, one may expect that all students as well as the stakeholders are aware of EMLYON's mission.

Encouraging entrepreneurial behaviour

EMLYON follows a differentiated strategy of encouraging entrepreneurial behaviour through EE, comprising three parts: **basic EE, specialisation, and practice**. Firstly, at a basic level, all students of all programmes are exposed to at least one course unit with respect to entrepreneurship. Secondly, EMLYON offers to specialise in a course related to entrepreneurship as part of the study programme. Thirdly, EMLYON provides a wide range of opportunities to practically engage in entrepreneurship. This practical engagement may take place either with direct involvement of EMLYON, e.g. through the incubator, or without, e.g. through student associations.

14.5. Outreach to external stakeholders of entrepreneurship education

14.5.1. Types of relationships with external stakeholders

Local, regional and global outreach

EMLYON is involved in several activities with the **local and the regional community**. Principal examples include programmes such as MultiCampus, Multidistrict Link and Entrepreneurs in the City.

EMLYON seeks to establish and develop links between students, school pupils and young entrepreneurs in underprivileged urban areas of the City of Lyon. The objective is to develop their entrepreneurial skills and potential and support their business start-up projects. Established in 2007 with the Sport in the City Association in Lyon, the **Entrepreneurs in the City** programme provides 250 hours of training. 60 young people have joined the programme by the end of 2014 and 30 businesses have been set up since its launch, ten of which have been selected to join the EMLYON Incubator.²⁶⁶

Regional partners provide for **grants** and bursaries for EMLYON's students. These include the EMLYON Entrepreneurs for the World; the CROUS bursary and the Jacques Lambert bursary. The Rhône-Alpes Regional Authority also helps finance international study trips.²⁶⁷

The **EMLYON Foundation** aims to develop the entrepreneurial spirit across the world, particularly via the educational system: The aim is to prepare entrepreneurs who are adaptable and able to work in countries around the world with different economic cultures. The Foundation helps developing entrepreneurs' social and environmental responsibility as well as creating new knowledge and new learning methods for young entrepreneurial leaders. Ultimately, the Foundation seeks to make EMLYON the European benchmark for education in entrepreneurship.²⁶⁸

²⁶⁶ See <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/Social-Responsibility>.

²⁶⁷ See <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/Who-we-are/Region>.

²⁶⁸ See www.fondationemlyon.com.

Close links with chamber of commerce

A specific characteristic of French management schools is their close connection to the local Chamber of Commerce. In case of EMLYON, the local chamber of commerce covers about 5,000 entrepreneurs in their "réseau d'entreprendre". It is through this link that many practical student projects and research projects, for example concerning the impact of entrepreneurship policies and practices, have emerged. There are about two to three meetings between the management school and the Chamber of Commerce Lyon every year. Vice versa, members of EMLYON faculty are advising the French network of the chambers of commerce and industry in the area of entrepreneurship.

World Entrepreneurship Forum

The relationships with external stakeholders culminate in the World Entrepreneurship Forum, a flagship global event for EMLYON. At this annual event, current entrepreneurs, would-be entrepreneurs, policymakers, practitioners, and board members meet and exchange their ideas.²⁶⁹ The World Entrepreneurship Forum considers itself as the world's leading think tank devoted to entrepreneurs. It is a community of 250 members from 70 countries who meet every year to find entrepreneurial solutions to pressing issues in the world. It was founded by EMLYON, KMPG, OnlyLyon, Nanyang Technological University, Action Community for Entrepreneurship and Zhejiang University. The Forum encourages all forms of entrepreneurship that integrate economic and social objectives. It encourages members to become involved by implementing entrepreneurial initiatives in their countries of origin.

14.5.2. International relationships

EMLYON maintains links with various overseas institutions of higher education. Particularly close and thus noteworthy are its relationships with Purdue University's Krannert School of Management (USA) and Zhejiang University (CHINE), as reported above.

The **Junior World Entrepreneurship Forums** (JWEF) are organised in different countries across the world by teams of students. They attract up to 10,000 students per year. Representatives from the Junior Forums attend the annual World Entrepreneurship Forum to report back on their recommendations. The Junior Forums offer young entrepreneurs and students the opportunity to meet and work with leading entrepreneurs.²⁷⁰

The student association **eMicrocredit** provides financing solutions to entrepreneurs from all around the world who do not have access to traditional credit. It finances projects across the world, whether they are in Cambodia, Benin or even Vietnam. It promotes micro-finance with students of the EMLYON Business School as well as local populations.²⁷¹

14.6. Impact and lessons learned

14.6.1. Evaluating impacts of the entrepreneurship education approach

Overview of impact evaluation methods applied

EMLYON evaluates its courses through the traditional formative and summative approaches. EMLYON uses several indicators to evaluate the impact and success of its entrepreneurial education: the number of students in optional courses, the feedback from students based on their teaching diaries, and the feedback from executive participants at the end of courses.

Furthermore, with samples of its students, EMLYON has repeatedly done research and published findings on the assessment of entrepreneurship education programmes. The survey results helped to reconsider the way EMLYON is organising its entrepreneurship education offers.

The EMLYON incubator is tracking its start-ups and their development. In 2014 the incubator celebrated its 30th anniversary. During that period, EMLYON reported to have accompanied

²⁶⁹ See <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/International-Focus>.

²⁷⁰ See <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/World-Entrepreneurship-Forum>.

²⁷¹ See <http://www.em-lyon.com/en/emlyon-entrepreneurial-education/emlyon-business-school/student-life-at-the-business-school/Men-Sharing-Centre/EMicrocredit>.

1,350 projects with industry and incubated 950 companies with an 85% survival probability after five years, altogether creating 11,000 jobs.²⁷²

Examples of successful companies

There are many examples of enterprises founded or co-founded by EMLYON graduates. At the 30th anniversary of the EMLYON Incubator, several of them were awarded a prize:²⁷³

LVL Medical: In 1989 Jean-Claude Lavorel created LVL Medical, now a reference for medical assistance at home. They offer patients the opportunity to be treated at home in the therapeutic conditions set by their doctors. The company has 3,600 employees working across France, with a turnover of 115 million euro.

Prismaflex: In 1988 Natalie Bassouls co-founded the Prismaflex group with Pierre Henry Bassouls and Jean-Philippe Delmotte. The group is both an industrial manufacturer of advertising products and a large-format digital printer. It has eleven subsidiaries, is present on all continents and listed on Euronext on the Paris Stock Exchange.

Methodia: Nicolas Bourgerie created Methodia, a European training company, in 2003. Its goal is to offer mass customisation. The company has trained over 30,000 individuals and 240 large companies.

Geolid: Gautier Cassagnau Gautier co-founded Geolid with Guillaume de Neuvier in 2008. The two partners who met during the "Petit Paumé" adventure at EMLYON propose innovative communication solutions. The company has eight regional offices, 120 employees and over 3,000 customers across France.

Sport dans la ville: In 1998 Philippe Oddou co-created Sport dans la ville in Lyon. It is an association that proposes insertion through sport and transmitted the values of sport so far to approximately 4,000 young people, often people in need of guidance in order to integrate socially and professionally. There were also 70 companies created since 2007 through the "Entrepreneurs dans la Ville" action, an entrepreneurship assistance programme designed by EMLYON and Sport dans la Ville.

14.6.2. Lessons learned

Summary of lessons learned from this case

There are several lessons for developing entrepreneurship education that can be learnt from the EMLYON case.

First, comprehensive entrepreneurial education may require a **long-term strategy**, continuity and persistence. At EMLYON, the strategic focus on entrepreneurship activities dates back at least three decades.

Second, the strength of EMLYON's approach may be in the **diversity of activities linked with education**: They are relating to research, teaching, incubating, mentoring, coaching, and other activities. Together these may generate an entrepreneurial culture throughout the university. In contrast to other cases of the sepHE study where there is often just a single personality or unit representing entrepreneurship education, at EMLYON the whole university was found to back EE.

Third, EMLYON was found to **integrate teaching, research and practice**. It seeks to address entrepreneurial issues systematically and it intends to be close to business practice.

Fourth, **continuous innovation** of educational practice may be required. Although successful comprehensive EE may require consistency and continuity over a long period of time – see the first suggested lesson above – there may also be a need for continuous innovation and improvement. Such innovation may be needed in order to stay up to date with developments in business, technology, society, and pedagogy.

²⁷² See <http://www.em-lyon.com/en/Journalist/press-releases-management-school-france/30th-anniversary-of-the-EMLYON-Incubator-1984-2014>.

²⁷³ Examples quoted in a shortened form from <http://www.em-lyon.com/en/Journalist/press-releases-management-school-france/30th-anniversary-of-the-EMLYON-Incubator-1984-2014>.

Transferability to other universities

EMLYON is a privately owned business school, thus the logic and the business model are very specific. Private for-profit universities in France and other countries may find the EMLYON approach or parts of it worth using for designing their own products and services. Public sector universities, especially those full universities covering a wide range of academic fields, operate with different objectives and logics. They may use certain of EMLYON's entrepreneurial elements for thinking about valuable practices for their own institution.

References

Research for this case study was conducted by Stefan Zagelmeyer, Manchester Business School, on behalf of empirica for the study "supporting the entrepreneurial potential of higher education" (sepHE). Sources and references used include desk research plus:

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15. Milan Polytechnic University, Italy: experience-oriented entrepreneurship education

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Abstract



Milan Polytechnic University (Polimi) is the largest Italian technical university. Its primary purpose is to provide students with solid technical competences. Recent studies on student entrepreneurship at Polimi have shown that the technical competences of Polimi alumni frequently generate new business ideas that often lead to start-ups. Thus, the University's School of Management has devoted growing attention to teaching students how to commercially exploit business opportunities by starting new ventures. For this purpose, it has developed an "experience-oriented approach" for its curriculum. This approach makes students test themselves in real-world settings through the development of a business model for an entrepreneurial idea. The approach is based on lectures from professors, guest lectures from practitioners, assisted work groups with mentor assignments as well as selecting and developing business ideas. Both undergraduate and postgraduate students were found to value this experienced-based approach. Besides its curricular offer, Polimi performs extra-curricular entrepreneurship education activities through its business incubator, PoliHub. PoliHub staff is marginally involved in curricular courses for Polimi students and provides actual and prospective incubated entrepreneurs with education opportunities. Moreover, it offers a number of non-education services to incubated companies. The Polimi case suggests that an experience-oriented approach should be tailored to the characteristics of the target group of students. The approach may easily be applied at any university where students develop technical competences or are trained to enter creative industries.

Case study fact sheet

▪ Full name of the university, location:	Milan Polytechnic University, located in Milan, Italy
▪ Legal status:	Public
▪ Location:	Two large campuses in Milan (Leonardo and Bovisa) and five smaller campus in Como, Cremona, Lecco, Mantova, Piacenza
▪ Year of foundation:	1863
▪ Number of students:	38,227 students enrolled in the 2013-2014 academic year (most recent available datum)
▪ Number of employees:	Teaching and research staff: 1,313 (at 31/12/2013) Administrative staff: 1,177 (at 31/12/2013)
▪ Budget in most recent financial year:	Turnover 2012: 550 billion Euros
▪ Academic profile:	Polimi is one of the largest technical universities in Europe. In recent years it climbed QS World University Rankings, reaching 31 st place in the world in the subject of Engineering and Technology
▪ Entrepreneurial profile:	Milan Polytechnic University, through its School of Management, is placing growing emphasis on entrepreneurial education through increasing the number of elective entrepreneurship courses at both undergraduate and postgraduate levels and through the extra-curricular activities offered by its incubator, PoliHub.
▪ Activities focused in this case study:	Elective course "High-Tech Entrepreneurship" – MSc level ("High-Tech Entrepreneurship" can be selected as a supplementary course by Polimi PhD students in the engineering field); entrepreneurship stream in the

	<i>Executive MBA and "Start-up Programme" – postgraduate level.</i>
▪ <i>Case contact person(s):</i>	<i>Gatekeeper: Evila Piva, Associate Professor at Polimi</i>

Information included in this case study is from end of year 2014 unless stated differently.

15.1. The university's entrepreneurship education profile

15.1.1. The university's overall approach to entrepreneurship education

Milan Polytechnic University (Polimi) is the largest polytechnic university in Italy. It began developing its entrepreneurship education (EE) in 2001, when the University incubator was created. Polimi incubator staff immediately started providing incubated university students, alumni and researchers with both basic skills and competences in the entrepreneurship field as well as services to help developing incubated companies. These offers were extra-curricular.

Since 2008, Polimi – more precisely, Polimi's School of Management – has placed growing emphasis on EE. The School of Management is made up of Polimi's Department of Management, Economics and Industrial Engineering as well as MIP Politecnico di Milano, Polimi's business school which is formally a non-for-profit consortium limited company.²⁷⁴ MIP is a consortium between the University, Assolombarda (the entrepreneurial Association of firms located in the region of Lombardy) and a number of primary multinational corporations (e.g., FIAT, IBM Italy, Vodafone). MIP has developed a curricular offer of entrepreneurship courses. At the moment (status: end-2014), there are a few entrepreneurship courses at both undergraduate and postgraduate levels and none of them is mandatory. However, the offer of elective courses in the entrepreneurship area is increasing. Polimi's specific approach in EE is experience-oriented.

Since 2012, Polimi's extra-curricular activities have also evolved significantly. The University incubator stopped being exclusively focused on Polimi students, alumni and researchers. It became PoliHub, a start-up district more and more focused on providing non-Polimi entrepreneurs who have innovative technology-based business ideas with the education and support they needed to develop their entrepreneurial projects.

15.1.2. Leadership and governance

Importance of government strategies

Both the Municipality of Milan and the Chamber of Commerce of Milan are highly committed to stimulating local development by fostering start-up creation and growth. The importance of support to entrepreneurship in the strategies of local public bodies has been crucial for the development of Polimi's extra-curricular activities. Since 2001, Polimi's incubator has taken advantage of financial support from the Municipality of Milan.

On the other hand, EE curricular offers at Polimi have never been driven or supported by any governmental strategies or programmes.

Importance of entrepreneurship in the university's strategy

At the moment, entrepreneurship plays only a minor role in Polimi's strategy. As one of the University's objectives is to support technology transfer activities, since 2001 Polimi has invested in the development of the incubator's extra-curricular activities. Conversely, EE curricular activities have no role in Polimi's strategy.

However, entrepreneurship has started playing an important role in the strategy of Polimi's business school MIP. In 2013 and 2014, in order to differentiate its offering from its main competitor, SDA Bocconi School of Management, MIP has started proposing itself as a business school able to train not only managers but also entrepreneurs. Hence, the number of entrepreneurship courses offered to MIP students has multiplied.

²⁷⁴ See <http://www.mip.polimi.it/mip/en/globals/mip.html>.

Extent of high level commitment to implementing entrepreneurship education

The commitment of past Polimi Rectors, Vice-Rectors and Deans of the different Schools in developing a solid offer of entrepreneurship courses has been limited. Conversely, the current Rector and the Deans of some Schools – in particular, the Dean of the School of Industrial and Information Engineering – are open to proposals from research groups active in the field of entrepreneurship. One of these proposals suggests the inclusion of one elective EE course in any MSc programme in the engineering field in the upcoming academic years. Furthermore, in previous years Polimi officers paid greater attention to supporting entrepreneurship among students and faculty members by devoting huge resources to the university incubator.

MIP high level officers show greater commitment to extend the business school's EE offer than Polimi officers do. As the MIP business school is a subsidiary participating in but not controlled by Polimi, MIP's strategy is influenced by the strategy of the University as a whole, but it is not an emanation of the latter. In recent years, the high level officers of MIP have constantly struggled to expand the school's education offer in the entrepreneurship area.

Level of faculties' and units' autonomy to act

At the University level, single researchers and research groups are free to propose courses, which can be included in different educational offers.. At the MIP business school level, faculty members are strongly encouraged to suggest courses for inclusion. At both levels, the effective inclusion of new courses is to be discussed and approved by the Programme Board. However, the probability that any new course is included in the educational offer of any programme is much more likely at the business school level as compared to the University level. This is due to the fact that the maximum number of credits that can be offered by the University is limited. Conversely, at the MIP business school, there is no constraint.

At both levels, the faculty members doing research in the entrepreneurship area are free to choose the contents and teaching methods of entrepreneurship courses.

Organisational implementation

At Polimi, EE initiatives are organised in a decentralised manner by the researchers active in the entrepreneurship field. These researchers are all located in the School of Management, i.e. the entity grouping Polimi's Department of Management, Economics and Industrial Engineering as well as the MIP business school.

University's importance for driving entrepreneurship in its environment

Polimi is very important for driving the creation of new businesses in the Province of Milan and the Lombardy region. Polimi contributes both technical and business competences for business ventures. For further details see the chapter about impact at the end of this case study.

15.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

EE initiatives at Polimi involve both academics and practitioners. The teachers of entrepreneurship courses are members of the School of Management faculty. Practitioners are usually involved in the courses for providing examples from real business life.

Financial resources for entrepreneurship education

Since EE offers are as yet limited, Polimi, at both University and business school levels, neither has nor needs a dedicated budget for EE.

15.2. Entrepreneurship in curricula and teaching

15.2.1. Overview about curricular offers in EE

Current offers

Polimi has three major offers in curricular entrepreneurship education: a course in "High-Tech Entrepreneurship", an "Entrepreneurship Stream" at Executive MBA level, and a "Start-up

Programme” within the MIP’s Entrepreneurship Academy offer. The Entrepreneurship Academy is a label under which MIP offers continuous education in entrepreneurship. These three curricular EE offers were selected for analysis in this case study because of their relatively large number of hours of lectures and case study discussion. The Start-up Programme does not offer academic degrees but certificates of participation.

There is also a “Business Planning” course” which is aimed at teaching participants how to write a business plan. The course is not providing any additional competences in the entrepreneurship field. Hence it is less interesting than the remaining initiatives described in this case study.

Exhibit 1-1 presents all curricular offers in entrepreneurship education at Polimi. See also the annex for a more detailed description of the three offers.

Exhibit 15-1: Overview about curricular offers in entrepreneurship education at Polimi

No.	Name	Objectives	Target group	Offered since	No. of participants in the last edition
1	“High-Tech Entrepreneurship” course	Providing students with knowledge, tools, and experiences that may help them to anticipate the problems likely to be encountered when establishing a new venture and to identify sources of information that can be used to find solutions to these problems.	Formally, students enrolled in Polimi MSc programme in automation engineering. Informally, students enrolled in any Polimi MSc and PhD programmes in the engineering field	2008/2009	95 (academic year 2013/2014)
2	“Entrepreneurship Stream” at Executive MBA level	Providing MBA students with skills, analytical tools, perspectives, and experiences that may help them to generate new business ideas, assess the attractiveness of a new venture, anticipate the problems likely to be encountered as the business evolves, and predict its success or failure	Postgraduate students enrolled in the Executive MBA scheme at MIP, Polimi’s business school	2012	Around 25 participants in each of the three courses included in the stream; 10 students attended the whole stream (last edition: year 2014)
3	“Start-up Programme” within MIP “Entrepreneurship Academy” offer	Providing participants with basic skills on specific topics, i.e. business planning and entrepreneurial finance	Polimi alumni and any other individuals with at least a few years of work experience interested in the topic	2012	27 (last edition: May-July 2014)
4	“Business Planning” course	Providing participants with basic knowledge necessary to develop a business plan.	Postgraduate students enrolled in the MBA at MIP	2013	24 (last edition: October 2014)

Source: Polimi

The first three initiatives presented in Exhibit 1-1 had a different evolution over time with regard to the number of course participants. While the number of participants in the “High-Tech Entrepreneurship” course has steadily increased since the first edition (which attracted only 16 students), the number of participants in the “Start-up Programme” and in the Entrepreneurship stream have decreased with respect to the previous edition. However, this reduction of the number of participants should not be interpreted as a signal of reduced interest in EE. Indeed, the decreased number of participants in the “Start-up Programme” is in line with a generalised

slight reduction of participants in the executive courses at MIP. Conversely, the lower number of Executive MBA students that selected the Entrepreneurship Stream is, at least partially, explained by the increase in the number of students who avoid selecting a specific stream but develop their own course schedule by combining courses from different streams.

Planned offers

For the academic year 2015/2016, two further EE offers are planned: a “Design Management, Innovation and Entrepreneurship” track and an “Advanced Master in Innovation and Entrepreneurship”. Both courses will be offered in English.

“**Design Management, Innovation and Entrepreneurship**” will be an elective track in the MSc in Management, Economics and Industrial Engineering. Its objective will be to provide students with skills and tools that may help them to manage the new product (service) development process from idea generation to the engineering phase and exploit the newly developed products (services) through the creation of a new business.

The “**Advanced Master in Innovation and Entrepreneurship**”, jointly developed with Solvay Brussels School of Economics and Management, is meant to help participants to adopt an entrepreneurial mindset and nurture their capability to identify new business opportunities, foresee the associated risks and ultimately outline viable strategies. Participants will be encouraged to continuously search new business opportunities and experiment with fast testing techniques that allow to quickly abandon unfruitful ideas and design viable business models. The Master will target individuals who envisage a career for example in young entrepreneurial ventures, internet-based companies, R&D departments of a company, new business division of a corporate, global and professional service firms, high-tech businesses, incubators, tech transfer offices VC funds, or entrepreneurship centres. Another target group will be members of the founding team of a start-up, or those who envisage a career as sole proprietor entrepreneurs or family business managers or both.

Moreover, from 2015 onwards MIP will also offer an elective one-week course in the entrepreneurship area named “New Venture Creation” in the MBA international programmes.

15.2.2. Target groups

Main target groups of entrepreneurship education at Polimi

The attendees of curricular EE offers at Polimi are very heterogeneous in terms of competences possessed when entering the programmes, prior work experience, and motivations for attending entrepreneurship courses. Hence, the EE offers need to be varied and tailored to the characteristics of the target groups. All EE offers have an experience-oriented approach, as described in the following, but the educational objectives, contents and activities performed in the courses are different.

The “**High-Tech Entrepreneurship**” course is an elective course, which is part of the educational offer in the MSc in Automation Engineering programme. However, at Polimi, students who are seeking an MSc or a PhD degree in the field of engineering are allowed to attend supplementary courses offered by any MSc programme. Therefore, all these students can be considered a target group for this course. All these students generally have a strong technical background but scarce knowledge about economics. They have no work experience, they are rarely nascent entrepreneurs, but either they have business ideas they would like to develop or they would like to be entrepreneurs in the future.

The **Entrepreneurship Stream** at MIP Executive Master of Business Administration (MBA) level and the “**Start-up Programme**” target postgraduate students who graduated in different fields and have some years of work experience. These students have a variety of professional backgrounds, mostly with technical competences and experience in technical functions, but they rarely possess business knowledge. The students usually are prospective or nascent entrepreneurs. They are interested in acquiring new knowledge and especially contacts to potential investors and other entrepreneurs who may be of help when developing their new business. They also seek to learn how to make the most out of these interactions.

Continuous education

MIP also offers continuous education in the entrepreneurship field, i.e. courses for professionals that do not lead to an academic degree. In order to make it easier for target groups to identify the EE offer of the business school, MIP has recently gathered all its EE offers under the label "Entrepreneurship Academy". The Entrepreneurship Academy includes both the Start-up Programme and short courses on Business Plan and venture financing.

15.2.3. Designing lectures and courses – basic curricular decisions

Intentions

Following students' motivation to attend the course, the key educational objective of the **High-Tech Entrepreneurship** course is helping students to identify the typical problems that entrepreneurs have to solve when transforming their ideas into new ventures. The course teaches how to frame related problems and how to find solutions. In particular, the course aims to enable students to recognise the stakeholders that may help nascent entrepreneurs to solve their typical problems.

The key educational objective of the courses in the **Entrepreneurship Stream** at MIP Executive MBA level and in the **Start-up Programme** is helping students to evaluate the attractiveness of their business ideas and to anticipate problems. The courses help putting students in contact with practitioners that may contribute to the development of their business ideas, and teaching students how to effectively communicate their ideas to investors or potential partners.

Contents

High-Tech Entrepreneurship is a 50-hour course where around 20 hours are devoted to frontal lectures, the remaining ones to meetings with practitioners and group work. The course is taught in English language.

The **Entrepreneurship Stream** in the Executive MBA programme lasts around 60 hours. More than half of the hours are frontal lectures and discussion of case studies. The Stream is organised in three courses: "Strategy in action", "Start-up" and "Entrepreneurial financing". They can be separately selected as elective courses also by Executive MBA students who chose a different stream or developed their own course schedule by combining courses from different streams. The three courses are all taught in Italian language. Students in the Entrepreneurship Stream and participants in the first two courses are supposed to develop an assignment in parallel with lectures. (For details see the "methods" section further below.)

The structure of the **Start-up Programme** has varied in the different editions, but the number of hours of frontal lectures is always around 20. Furthermore, students are also supposed to accomplish Project Work. Such Project Work consists of working in groups to develop a business model for an entrepreneurial project proposed by group members. The hours devoted to the project are highly variable and depend on the characteristics of each project. The course is taught in Italian language.

Some topics are part of all entrepreneurship courses at Polimi, including the Business Model Canvas, the structure of a business plan and entrepreneurial exit strategies. Further topics covered in all courses include the following:

- **Key challenges:** In both the High-Tech Entrepreneurship course and the Entrepreneurship Stream, the instructors expose the students to the key problems that entrepreneurs encounter in establishing a new venture. This includes gaining access to the competences, funds and complementary assets necessary for venture development as well as possible solutions to these challenges.
- **Team:** In all courses the instructors first discuss the ideal composition of the entrepreneurial team and the challenges associated to team formation. The reason is that start-up competence and initial resource shortages are strongly connected to the characteristics of the founding team.
- **Finance:** Issues of entrepreneurial finance are also discussed in all courses. Specific issues include the origins of funding gaps in new ventures, the question how banks, equity

investors, and public subsidies may contribute to fill these gaps, and the challenges associated to the use of the different financing mechanisms. At the postgraduate level, instructors also present more innovative financing mechanisms such as crowd funding and discuss their pros and cons.

- **Soft skills:** In the postgraduate courses, instructors also discuss about entrepreneurial soft skills. Students can familiarise themselves with creativity techniques and methods how to more effectively communicate the business idea, for example the elevator pitch.

Methods

Polimi's three major EE offers all apply an **experience-oriented approach**: students are encouraged to test themselves in real-world settings. There are four key steps to implement the experience approach at Polimi: mentor assignment, guest speeches, group formation and selecting business ideas, as described in the following.

For each student, an **assignment with a practitioner** who acts as a mentor is developed throughout the courses. The assignment consists of finding a business idea and developing a business model around it taking advantage of the practitioners' advice. In order to do so, students work in teams through issues of market analysis, technology viability assessment, competitive positioning, team building, and marketing strategy.

As the development of the mentor assignment is crucial, the number of frontal lectures is relatively low. Instead, many hours are allocated to **guest speeches** by entrepreneurs, professional investors, incubator officers, and policy makers who design policies that contribute to new business development. These guests primarily describe their activities to students but also listen to students' presentations of their business ideas and provide them with feedback to help them improving their business models. For further selection of mentors and guest practitioners see section 1.2.5.

Group formation. At the beginning of the courses, the students must gather in groups of three to five. The course leader of the "High-Tech Entrepreneurship" course usually provides students with guidelines for group formation. For example, the team should be as heterogeneous as possible in terms of competences of group members. The students are then free to choose whom to team up with. The rationale behind minimising interference of the course leader in group formation is that trust is crucial for success. Hence students must be free to team up with other students they trust. At post-graduate level, no guidelines are provided: course participants are free to form the groups as they prefer.

The groups then need to propose and select the **business ideas** to be developed into a business model. Students are supposed to present their ideas to their mentors a couple of weeks after having formed the groups. Since it often happens that some groups have more than one idea, mentors are responsible to help them in selecting the most promising one. In most groups one or more members are already trying to set up a company or have an idea they would like to transform into a new venture. These groups are usually encouraged to work on these ideas. However, sometimes, in the "High-Tech Entrepreneurship" course, no members of the group have any business ideas. In this occasion, group members are asked to look for a business idea among the research groups of Polimi, e.g. by contacting the professors they know. Polimi professors are usually willing to disclose some of their research results to students. They appreciate the opportunity to explore and realise the potential for commercialisation of their research findings. Sometimes it turns out to be a useful starting point for the professors to engage in the commercialisation of their research results themselves.

Media

Media used in EE courses do not differ from those used in other courses. PowerPoint presentations and, sometimes, videos are used by both academic instructors and guest speakers.

Informal evaluation of learning outcomes and feedback for students

In all EE initiatives scrutinised here, the mentors provide an informal evaluation of students' work. Students involved in past editions of these EE initiatives provide comments to course leaders (see the "evaluation of courses and programmes" below). These comments revealed that students assess the interaction with the mentors usually as extremely useful. Of course, if a mentor has specific knowledge in the industry sector of the business idea of the students she

or he is assisting, it will be easier for her or him to contribute to the development of the business model. She or he will be particularly committed to do so. However, according to past students, interactions with mentors from different industry sectors are also useful. These individuals can provide the group of students with a different perspective.

In the “High-Tech Entrepreneurship” course, throughout the course guest speakers provide students with suggestions after listening to the synthetic presentations of their business ideas. The comments of past students revealed that interactions with guest speakers are, on average, less useful than interactions with the mentors. However, sometimes guest speakers were found to have been able to provide some groups with brilliant solutions to highly specific problems.

Using results of entrepreneurship research

The results of entrepreneurship research conducted at Polimi’s School of Management drive the choice of the contents of the courses, especially at postgraduate level. The contents transferred in frontal lectures to MBA students is more specific than the contents transferred in lectures to undergraduates or recently graduated students. Hence, in MBA courses the instructors tend to present also results of the research they are currently conducting.

15.2.4. Setting of entrepreneurship teaching

Locations

Teaching takes place in University classrooms.

Timing

Each EE offer described here has a different timing. The **High-Tech Entrepreneurship** course takes place from March to June of each year, and the final exam is scheduled for July. Lectures and guest speeches take place twice a week. The length of lectures is around three hours. Guest speeches last 1.5 hours and are always followed by a 1.5 hour work on students’ business models. During this time, students present their ideas to guest speakers looking for their feedback and suggestions to address unsolved problems.

The **Entrepreneurship Stream** in the Executive MBA programme is organised in three courses of 20 hours each that are scheduled from March to June. Each course is carried out on three consecutive days.

The **Start-up Programme** has no fixed structure at the moment. Previous editions lasted between six and ten days, either consecutive or distributed over one, three or six months. So far, the best solution was found to be two days per week in one month: On the one hand, meetings have then sufficient time in between to provide students with the opportunity to evolve their business ideas. On the other hand, the meetings timed this way are not too far apart, thus helping students to keep focused. Moreover, this schedule is not too demanding for executive students who have to reconcile their professional activity with participation in the course.

Formal evaluation of learning outcomes

The experiential approach adopted at Polimi relies on the assumption that in entrepreneurship courses the final exam – i.e. the formal evaluation of learning outcomes – should be an **exercise close to real business life**. Hence, both in the “High-tech Entrepreneurship” course and in the two other EE initiatives described here, the final exam consists in the analysis of a business idea and the development of a business model. Course leaders build an “evaluation committee” composed of both academics (the course leader himself and the mentors) and practitioners (venture capitalists, business angels, incubators’ officers). They receive the written document and provide students with feedback after an oral presentation of the business idea. In order to carry out the exam as closely as possible to reality, the presentation is structured as an “elevator pitch”. After the presentation of the business model, the evaluation committee assigns a mark to each group.

The formal evaluation of the business models slightly **differs at MSc and postgraduate levels**. At MSc level, the participation of each group member in the final presentation is crucial. Hence the final mark takes into account whether each group member had a role in the final presentation. Moreover, despite that the mark is assigned to the group, in the High-Tech

Entrepreneurship course each student has a “revise and resubmit” option: If any student of a group aims at obtaining a better mark, in a few weeks he or she can submit a new version of the business model that takes into account (at least some of) the suggestions of the evaluation committee. This new document is evaluated by the academic members of the evaluation committee who decide whether the mark of the student is to be changed – of course without changing the marks of the remaining members of the student’s group.

At postgraduate level (i.e. EMBA programme and Entrepreneurship Academy courses), the individual contribution is not important: the final mark only takes into account the quality of the business model developed by the group and the effectiveness of the presentation.

15.2.5. Instructors: teachers and mentors

Professors, other employees and external lecturers of the university

Prof. Massimo G. Colombo and Prof. Andrea Rangone are the two full professors leading the activities in the entrepreneurship area at the School of Management. Prof. Colombo, Full Professor of Economics of Technical Change and Deputy Dean for Research, is the course leader of “High-Tech Entrepreneurship”. In this course, he also involves a couple of PhD students per year as tutors (see the “mentors” subsection). Prof. Rangone, full professor of Business Strategy and E-Business, leads the courses at the business school, i.e. the courses in the Entrepreneurship Stream and the Start-up Programme. He involves five assistants and associate professors of the Department. At the moment there is no chair in entrepreneurship at Polimi.

“Real entrepreneurs” as teachers

In each course, real entrepreneurs are occasionally invited to tell their experience to students. The selection of the entrepreneurs to be invited is crucial for the success of the course. The profiles of guest entrepreneurs differ depending on the target audience.

At **MSc level**, students should perceive entrepreneurs by as role models so as to become motivated to engage in and devote efforts to entrepreneurial initiatives. Hence, guest entrepreneurs tend to be young, they often are Polimi alumni, and they have recently founded start-ups. As to the industry where guest entrepreneurs operate, given the background of Polimi students, the course leaders tend to select ICT entrepreneurs. ICT industries are the most natural outlet of Polimi graduates in engineering.

At **postgraduate level** (i.e. EMBA programmes and Entrepreneurship Academy courses), students are constantly looking to enrich their network and they are particularly interested to obtain new influential contacts. Hence, guest entrepreneurs in executive courses tend to be more experienced. They usually founded successful companies which in a few years achieved high growth rates. Some entrepreneurs eventually exited the companies. Since executive students are employed in a varied range of industries, the industries in which guest entrepreneurs operate are more varied, too.

Mentors

In the “High-Tech Entrepreneurship” course, there are a couple of mentors per year who are responsible for providing students with feedback on their business ideas and advice so as to help them in developing their business models. Mentors are selected among PhD students doing research in the entrepreneurship field to be sure they have adequate competences to help students in developing the business models.

In the EE offers at postgraduate level, i.e. Entrepreneurship Stream, Start-up Programme mentors are selected from a pool of more experienced practitioners and academics: entrepreneurs, managers employed in large companies, professors, academic researchers, and PhD students who are experts of the technologies on which the students’ business ideas are based. The individuals in this pool are part of the networks of contacts of the professors involved in these two EE offers. Each group of students is assigned to the mentor whose area of technical expertise is closest to the technical field to which the students’ business idea belongs. A mentor could occasionally be assigned to more than one group.

15.2.6. Management of entrepreneurship education

Teacher and trainer management

Since there is no chair of entrepreneurship at Polimi at the moment, no selection has been made to identify those academics who are best skilled and most suitable to teach EE courses. The academic researchers to be involved either as teachers of specific topics or as mentors are selected by the full professors responsible for the courses. In order to select the researchers to be involved, the full professors responsible for the courses take into account the competences of the candidates, their attitude, and their willingness to be involved in the programmes. No specific incentives are provided to teachers. There is no specific approach for “teaching the teachers” about how to teach entrepreneurship.

Managing student support

Student support is part of the tasks to be performed by **mentors**. For effectively managing the mentors it is crucial to select them appropriately, evaluate their work and ensure their commitment. As the criteria for mentors’ selection have already been described (see the “mentors” paragraph above), this paragraph will focus on evaluation of their work and ensuring their commitment.

In all EE offers described here, the evaluation of mentors’ work is based on the **comments provided by participants** at the end of the courses (see also “evaluation of courses and programmes” below). If participants are not satisfied with the work of some mentors, course leaders will avoid assigning other groups to these mentors in the future.

While the methods for evaluating the mentors’ work are similar, the three EE initiatives differ in the activities to ensure mentors’ commitment. In the “High-Tech Entrepreneurship” course, commitment is ensured by using both monetary and non-monetary incentives. First, mentors receive an additional payment for their mentorship activity. In addition, they are made responsible for contacting the guest practitioners, arranging their speeches and facilitating the relationships between these guests and students. This additional responsibility is seen as a valuable opportunity for mentors. As the mentors are doing research in the entrepreneurship field, they are very interested in enlarging their network of contacts with both entrepreneurs and financiers or policymakers providing support to entrepreneurs.

In the postgraduate EE initiatives, mentors’ commitment is ensured relying on non-monetary incentives. As each mentor is assigned to students that are developing business ideas in her or his area of expertise, the mentor will be interested in closely following the development of students’ business model as this may generate spill-overs for her or his own professional activity.

Management of curricular integration and attracting new groups of students

As regards marketing the three EE offers among prospective students, a clear difference exists between initiatives at undergraduate and postgraduate levels. The “High-Tech Entrepreneurship” course is not marketed at all among students. It is just included in the list of elective courses offered to MSc and PhD students.

On the other hand, ad hoc marketing actions are in place for the Entrepreneurship Stream and the Start-up Programme. These marketing actions differ between the Entrepreneurship Stream at the Executive MBA level and the Start-up Programme. Since the three courses included in the Entrepreneurship Stream are part of the list of courses that master students may attend during the second year of their Executive MBA programme, marketing simply consists in presenting the contents of the three courses to students and highlighting the benefits of attending the whole stream. The presentation of the Stream and of its courses usually lasts between 15 and 30 minutes, it takes place at the beginning of the second year of the Executive MBA programme, and it is carried out by some of the professors involved in the courses. Conversely, the “Start-up Programme” is marketed through MIP’s website and through an ad-hoc event that takes place some weeks before the course starts. This event is organised to discuss topics related to entrepreneurship and present the course. Prospective students are invited to attend the event using both MIP’s mailing list and MIP’s website. In marketing both the Entrepreneurship Stream and the “Start-up Programme”, the experience-oriented approach is highly emphasised as the main strength of the EE offer.

Evaluation of courses and programmes

All entrepreneurship courses are evaluated by participants through standardised evaluation forms that are used to evaluate any courses offered at the University or at the MIP business school.

At **MSc** level, at the end of each course, students are required to answer an evaluation questionnaire with 19 items and a four-point Likert scale in the four groups: (1) Interest and satisfaction with the course; (2) learning activities (e.g. contribution of the teachers to the learning process, co-ordination between different teachers, adequacy of study load, usefulness of course material); (3) course organisation (e.g. availability of teachers for providing explanations, clarity of the structure of the final exam); (4) infrastructure.

At **postgraduate** level (i.e., EMBA programme and Entrepreneurship Academy courses), students are required to evaluate each module (a module consists in two lecture hours) by scoring on a five-point Likert scale for four items: (1) usefulness of module content; (2) contribution of the teacher(s) to the learning process; (3) usefulness of course material; (4) self-evaluation of the previous knowledge of the subject addressed in the course. The results of these evaluations do however not allow conclusions about the development of students' entrepreneurial mindsets, skills and behaviour through the course.

For all offers, students are also encouraged to provide the course leaders with any constructive comments to improve the course.

So far, the comments provided by past participants have been taken into account to improve the courses, but the changes introduced in the course programmes have always been marginal. For example, course leaders have started placing more emphasis and devoting more time to the topics that students have highlighted as more interesting or more difficult to understand due to lack of previous knowledge.

Comments provided by past participants reveal that both MSc and postgraduate students appreciate the experience-oriented approach. MSc students particularly value the opportunity to realise a group work in a team whose members have heterogeneous competences and the interaction with the mentors. Students enrolled in the EMBA programme and in Entrepreneurship Academy courses mainly value the opportunity to enlarge their networks of contacts by meeting entrepreneurs, managers and potential investors and the opportunity to find team mates for their business ideas. Moreover, they appreciate the opportunity to work on real-life cases.

Management of continuous education

The Start-up Programme is part of the continuous education initiatives realised by MIP. These initiatives also include free events and, more importantly, short for-pay courses (from one to three days) on specific topics. For example, during this study year, MIP has offered both courses on Business Planning and a course on Financing through crowdfunding.

15.3. Extra-curricular activities in entrepreneurship education

Overview about extra-curricular entrepreneurship activities

Two notable extra-curricular entrepreneurship activities are running at Polimi, both operated by PoliHub: Switch2Product²⁷⁵ and CupCake²⁷⁶. Switch2Product is an initiative of Politecnico di Milano together with the Politecnico di Milano Foundation and the Milano Municipality, in collaboration with the Banca del Monte di Lombardia Foundation and supported by Microsoft YouthSpark as well as Cariplo Foundation. CupCake is a partnership project by Politecnico di Milano, PoliHub and the Politecnico di Milano Foundation.

A third notable activity, Microsoft YouthSpark, was discontinued at the end of 2013. Exhibit 1-2 presents the main characteristics of these activities.

²⁷⁵ See <http://www.polihub.it/en/what-we-do/scouting/s2p-switch2product-sesta-edizione/>.

²⁷⁶ See <http://www.makeyourcupcake.it/>.

Exhibit 15-2: Overview of extra-curricular EE activities at Polimi

No.	Name	Objectives	Target group	Offered since	No. of participants in the last edition
1	Switch2Product	Promoting creativity and idea generation, which may lead to the development of new high-tech products or services, or innovative design	Any person or team with a scalable and high potential idea (not confined to Polimi)	2010	150 (sixth edition that took started in October 2013)
2	CupCake	Stimulating the development of ideas for the start-up of creative enterprises able to respond to new needs and new target markets.	Designers with, at least, a Bachelor degree, who are currently unemployed or have no work experience yet (not confined to Polimi)	2013	21 (second edition, started at the beginning of 2014)
3	Microsoft YouthSpark	Connecting young people with greater education, employment, and entrepreneurship opportunities.	Undergraduate students (not confined to Polimi)	2012 (ended in 2013)	500 (in 2013)

Target groups of extra-curricular activities

The audience of Polimi’s extra-curricular activities is very heterogeneous. The initiatives are directed to both undergraduates and recent graduates, be they from Politecnico di Milano or other universities. Switch2Product targets any person or team with a scalable idea; CupCake targets designers with at least a Bachelor degree who are unemployed or have no work experience yet.

Objectives, contents and methods

The aim of the extra-curricular activities is to help young people with promising business ideas to develop the ideas for possibly launching a new venture. To do so, idea proponents are provided with both training and, eventually, incubation services offered by PoliHub staff.

In **Switch2Product** any person or team with a scalable and high potential idea is encouraged to send a description of the idea to PoliHub. PoliHub staff will evaluate these descriptions and select the top ten projects. The proponents of these projects will then gain access to the Innovation Camp, a week of training, tutoring, and team building that will help them to understand how to develop their business ideas. After this camp, the top five meritorious projects will be selected and gain access to both incubation for a three-month period in PoliHub facilities as well as support and training in business plan writing. At the beginning of 2014, the seventh edition of Switch2Product was launched.

The **CupCake** initiative reached its third edition in 2014. CupCake is about placing creative designers with innovative product or service ideas into a European company in a three-month internship, business incubator or development agency. A mentoring service will support the designers during and after the internship. The service intends to provide technical and economic assessment of the projects, the production of prototypes and service testing.

Using results of extra-curricular activities of entrepreneurship education

Extra-curricular activities are currently separated from curricular EE activities. The only connection between the two types of activities is a recent initiative of PoliHub: Since academic year 2013/2014 PoliHub offers three months of free incubation as an award for the best project realised in the “High-Tech Entrepreneurship” course.

Locations

The Switch2Product and CupCake extra-curricular activities take place at PoliHub facilities and in other locations. Locations varied across the different editions of the two initiatives.

Persons involved in extra-curricular activities

Extra-curricular activities mainly involve PoliHub staff.

15.4. Institutional aspects of entrepreneurship education

Organisational set-up and change

Curricular EE courses are a fairly recent phenomenon at Polimi, not affecting the whole of the university yet. Currently the courses are confined to the business school and, on a lower level, to engineering schools. Hence there are no specific entrepreneurial entities yet neither at University level nor at the business school. Moreover, there are currently no plans for introducing any entrepreneurship-related entities or management positions.

Laws, statutes and codes

Entrepreneurial activity of Polimi students is not regulated by any specific rules or laws. Conversely, the participation of Polimi professors in spin-off companies is subject to national laws (Ministerial Decree no. 168 of 10 August 2011) and University rules. In particular, there is a clear procedure that Polimi researchers must follow for requesting recognition of their start-ups as spin-offs.²⁷⁷

At the moment, there are no specific incentives neither for staff nor other stakeholders to contribute to EE.

Mindsets and attitudes

At the moment, there are no structured activities at University level to raise awareness about the importance of entrepreneurship and entrepreneurship education. However, a series of activities has been realised by both the MIP business school and PoliHub. Specifically, at MIP, in both curricular courses and events open to a wider public, successful entrepreneurs are often invited to tell their experiences. The presentations of these guests offer the opportunity to make the audience aware of the business school's EE offers. PoliHub frequently organises lectures by leading players of the start-up market, seminars focused on start-up business development and workshops on specific key-technologies. These events are often open to incubated start-ups and prospective entrepreneurs.

15.5. Outreach to external stakeholders of entrepreneurship education

Relationships with PoliHub

PoliHub, Polimi's incubator, is a major co-operation partner in EE. PoliHub is partially involved in some EE initiatives by Polimi and is responsible for extra-curricular initiatives. EE lecturers interact with PoliHub staff. In particular, in the "High-Tech Entrepreneurship" course, PoliHub has a double function. First, every study year one member of the incubator staff is part of the committee that evaluates the business models developed by the students who attended the course. Second, since study year 2013/2014, PoliHub is offering three months of free incubation as an award for the best entrepreneurial project. Since 2013, PoliHub is offering free incubation services also to the best projects in the "Start-up Programme".

Relationships with enterprises and financial institutions

As above mentioned, entrepreneurs and managers from companies and financial institutions are invited to take part in the EE courses held at Polimi as guest lecturers. Some practitioners have frequently participated in Polimi's EE initiatives, e.g. Diana Saraceni, Senior partner of 360 Capital Partners, Marco Corradino, founder of Volagratis.com, and Vito Lomele, founder of Jobrapido. However, no formal agreement exists between Polimi and the companies and financial institutions of these practitioners.

²⁷⁷ For details see http://www.polimi.it/uploads/media/university-spin-off-regulations_01.pdf.

International relationships in entrepreneurship education

In September 2014, MIP has signed a formal agreement with **Solvay Business School** concerning a Double Degree for an “Advanced Master in Innovation and Entrepreneurship” that will be jointly offered by the two business schools starting from September 2015.

No other international relationship has been developed in the EE area as all the courses currently offered at Polimi and at the business school are in Italian. However, in 2015 the business school will start offering the first entrepreneurship courses in English (i.e. the entrepreneurship concentration in the international MBA programme), and the University will extend its offer by launching the “Design Management, Innovation and Entrepreneurship” elective track in the MSc programme in Management, Economics and Industrial Engineering. The leaders of these new courses are currently contacting foreign scholars in the entrepreneurship field to involve them in future editions of these courses.

15.6. Impact and lessons learned

15.6.1. Evaluating impacts of the entrepreneurship education approach

Overview of impact evaluation methods applied

At the moment there are no specific activities at Polimi to measure the impact of the EE initiatives beyond course evaluation (see the section “evaluation of courses and programmes” above). In particular, there are no official sources of information about start-ups created by Polimi alumni.

Studies about the involvement of Polimi alumni in start-ups

However, some researchers from Polimi’s School of Management believed that the technical competences provided to its students should be a crucial source of new venture creation at the local level. Hence, the School of Management recently conducted a study for evaluating start-up creation by Polimi alumni. This study revealed that out of the 62,492 Italian alumni that received a BSc, MSc or PhD degree at Polimi between 2000 and 2009, 3,375 alumni acquired shares in young companies. 2,852 (4.6%) of these Polimi alumni were part of the founding teams of those ventures. Altogether, these 2,852 alumni founded 3,115 new ventures by mid 2014. Nearly 80% of these ventures are located in the Lombardy Region. Specifically, 38% are located in the Province of Milan and other 40% in the remaining provinces of the Region.

Another study conducted at Polimi School of Management showed that MIP alumni also contribute to new venture creation at the local level. Out of the 1,736 Italian alumni that received an MBA (or Executive MBA) degree at MIP between 1993 and 2012, 302 alumni acquired shares in young companies. 214 (13%) of these alumni were part of the founding teams of these ventures. Overall, these 214 alumni founded 269 new ventures by mid 2013. The 269 ventures are mainly located in the Lombardy Region: 37% of these ventures are located in the Province of Milan and other 14% in the remaining provinces of the Region.

These studies provide an impression of the impact of Polimi alumni on entrepreneurship activities. However, the studies do not allow to draw a direct relationship to entrepreneurship education Polimi’s activities.

15.6.2. Lessons learned

Summary of lessons learned from this case

Designing and running Polimi’s entrepreneurship courses allows to formulate the following lessons learned:

- Students were found to appreciate Polimi’s experience-oriented approach. MSc students particularly value the opportunity to work in teams with different competences and the interaction with mentors. Students attending the EMBA programme and Entrepreneurship Academy courses mainly value the opportunity to enlarge their networks.
- **Size of the class.** The class must not be too large, otherwise the interaction with the guest practitioners becomes too complex. On the other hand, if the size is too small, there are limited opportunities of cross-fertilisation of the business ideas and interactions among

students with different competences. The ideal size according to Polimi's experiences may be around 50 students.

- **Composition of the groups.** The student groups working on the business idea must not be too large as well. In large groups students may find it difficult to find a role, while in small groups the probability that innovative solutions emerge are limited. The ideal size was found to be three to five students per group. Moreover, groups consisting of students with different educational backgrounds are likely to generate more innovative projects.
- **Importance of attending classes.** Attending lectures and, in particular, meetings with guest practitioners and with mentors is crucial to help course participants develop their business models. Hence, if the course is not mandatory, the course leader should constantly remind students about the importance of attending classes.
- **Need for incentives.** In order to stimulate students to work and mentors to provide adequate support to students, providing the right incentives is crucial. Polimi's experience is that offering an award for the best projects had positive effects on the efforts of students. Besides the group incentive provided by the award, students seeking an MSc degree may also need individual incentives. The "revise and resubmit" formula used in the "High-Tech Entrepreneurship" course has been proven to be particularly effective. As to mentors, monetary and non-monetary incentives were found to be crucial to keep them committed.

Transferability to other universities

The experience-oriented approach adopted at Polimi may easily be transferred to any technical university and to any university offering degree courses designed to allow graduates operate in creative industries, for example cinema or media. Some changes may be required for an effective transfer of the approach to other universities, considering the universities' specific circumstances. For example, guest practitioners should be selected in the industries that are the natural outlet of target students.

References

Research for this case study was conducted by Evila Piva, Assistant Professor at Polimi, on behalf of the study for supporting the entrepreneurial potential of higher education (sepHE). Sources and references used include desk research plus:

Interviews

- Prof. Massimo Colombo, full professor Full Professor of Economics of Technical Change and Deputy Dean for Research at Polimi School of Management responsible for the *High-tech entrepreneurship* course, interviewed on September 5th 2014, in Milan.
- Francesca Tenca, PhD student at Polimi who has been tutor in the 2013/14 edition of the *High-tech entrepreneurship* course, interviewed on September 5th 2014, in Milan.
- Claudia Pingue, COO at PoliHub, and Domenico Pannofino, staff member at PoliHub, interviewed on September 10th 2014, in Milan.
- Dr. Raffaello Balocco, assistant professor at Polimi School of Management, involved in the EMBA entrepreneurship courses and responsible for the *Entrepreneurship Academy* courses, interviewed on September 11th 2014, in Milan.
- 2 focus groups with small groups of students have been organized (for privacy reasons, the names of the students cannot be reported here).
 - On December 2nd 2014: focus group with 5 students of the 2012 edition of the EMBA programme (i.e., students that started attending the EMBA programme in 2012 and thus attended the elective courses during 2014)
 - On December 13nd 2014: focus group with 6 undergraduate students who attended the High-Tech Entrepreneurship course during 2014

All these interviews were face-to-face interviews.

Websites

- Programme of the high-tech entrepreneurship course available at: https://www4.ceda.polimi.it/manifesti/manifesti/controller/ManifestoPublic.do?EVN_DETtaglio_RIGA_MANIFESTO=evento&aa=2012&k_cf=225&k_corso_la=436&k_indir=XEN&codDescr=090917&lang=IT&semestre=2&idGruppo=2573&idRiga=150280
- Website of MIP, Polimi business school: <http://www.mip.polimi.it/mip/en.html>
- Information on the Entrepreneurship Academy: <http://www.mip.polimi.it/mip/it/Corsi-Brevi/Entrepreneurship.html>
- Website of Polimi incubator: <http://www.polihub.it/en/>
- Rules for the participation of Polimi professors

Annex

Course description "High-Tech Entrepreneurship"

TITLE	High-tech entrepreneurship
PROFESSOR IN CHARGE	<p>Prof. Massimo G. Colombo Massimo.colombo@polimi.it Phone 02.2399.2748</p> <p>Prof. Marco Giorgino Marco.giorgino@polimi.it Phone 02.2399.2759</p>
LECTURERS	<p>Prof. Massimo G. Colombo Prof. Marco Giorgino Dott.ssa Daniela Luz Laurel Ing. Mario Salerno</p>
MISSION AND GOALS	Generating interest for the foundation of a high-tech company. Providing a comprehensive overview of the processes and problems concerning the creation of a high-tech company, the managerial challenges involved and the sources of financing
SUBJECT AND PROGRAMME OF THE COURSE	<p>The creation of new technology-based firms. Entrepreneurship in high-tech industries in Italy and in the world. The business plan. Organisational issues and HR management. The protection and commercialisation of an innovative technology. The role of incubators.</p> <p>The development of new technology-based firms. The performances of new technology-based firms: the founding team, the knowledge gap and the funding gap. The access to external resources and competencies: strategic alliances and acquisitions.</p> <p>The financing of new technology-based firms. The financing of new technology-based firms: equity, debt capital and public subsidies. The evaluation of new technology-based firms. Listing on the stock exchange. Public policies for new technology-based firms.</p>
TEACHING ORGANIZATION	<p>Lessons: 21 hours Laboratory work: 18 hours Guest speakers: 15 hours</p>
TEACHING MATERIALS	Articles and transparencies
LEARNING EVALUATION	Development of the business plan of a new venture based on an innovative technological idea in the field of study of the students (e.g. based on the research projects carried out in the corresponding department at Politecnico).
ACADEMIC CALENDAR	<p>From 10 March 2010 to 17 June 2010</p> <p>Wednesday (LEZ- ESE) 15.15 – 18.15 Classroom CT 68 Thursday (LEZ- ESE) 16.15 – 19.15 Classroom D 2.4</p>
SECRETARY'S OFFICE	<p>Sig.ra Giuseppa Di Tavi giuseppa.ditavi@polimi.it Phone 02.2399.2774</p>
LOCATION	Campus Bovisa

Source: http://www.ricerca.polimi.it/uploads/media/Colombo_Giorgino_Hig-tech_entrepreneurship_01.pdf (last accessed 11 March 2015)

Course description “Executive MBA Stream in Entrepreneurship” and “Start-up Programme”

Program	Description	Key topics
Executive MBA Stream in Entrepreneurship	The stream aims at supporting prospective entrepreneurs and executives in developing their own personal and corporate business ideas. At the conclusion of the course, students will have mastered the wide array of capabilities they need to set up their own business initiative successfully.	<ul style="list-style-type: none"> • Strategy II – Strategy in action • Strategy II – Start up • Entrepreneurship and new technologies <p>The stream is based on action learning, in this case project work where participants propose and develop a business plan that is evaluated by a committee composed of MIP professors, executives, venture capitalists and business angels. During the course, students will be assigned to a mentor (e.g. a technology expert, entrepreneur, venture capitalist, business angel, corporate executive, etc.) who will act as their point of reference.</p>
Start-up Program	Master course targeting entrepreneurs who have recently launched a start-up company or aspiring entrepreneurs, with the goal of supporting them in fine-tuning their projects.	<ul style="list-style-type: none"> • Industry foresight, Strategy and Business models • Market insight and Fast prototyping • Operations and Organisation design • Economics • Personal development – Coaching <p>The program is based on action learning, mixing lectures with assignments and project work relating to business initiatives proposed by participants and supported by tutors. The project will be evaluated by a committee composed of MIP professors, executives, venture capitalists and business angels.</p>

Source: <http://www.mip.polimi.it/mip/en/globals/AREA/Entrepreneurship>, last accessed 11 March 2015.

16. University of Osijek, Croatia: Developing entrepreneurship education from scratch over time

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Abstract



The objective of entrepreneurship education (EE) at the J.J. Strossmayer University in Osijek (SUO), Croatia, is to develop entrepreneurial mindsets and related skills. The curriculum consists of an undergraduate, graduate, a postgraduate and a doctoral programme in entrepreneurship. Key to programme development were the commitment and the personal skills of Prof. Slavica Singer who managed legal, economic and cultural barriers in a post-war and post-socialist environment. Applying the method of systems thinking, she built relationships with international universities and external lecturers, developed her own faculty staff and established local institutions for microfinance, training of entrepreneurs and policy development. Particularly notable EE practices include the SUO's international doctoral programme, team teaching and the drama method. One of the main lessons to be learned from this case is that even in an unfavourable environment it is possible to build EE and a related ecosystem. The preconditions are that there is adequate human resource management, basic funding and autonomy to act. The approach might be transferable to countries or regions with comparable disadvantageous framework conditions.

Case study fact sheet

▪ Full name of the university and location:	Josip Juraj Strossmayer University in Osijek (SUO), Osijek, Croatia
▪ Legal status:	Public
▪ Year of foundation:	Economic faculty (1961), University (1975), entrepreneurship education team (2000)
▪ Number of students (2012/2013):	University: 20,746 Economic faculty: 4,037 Entrepreneurship education: 115 (enrolled in the programme – undergraduate, graduate, postgraduate); 1,165 (enrolled in single entrepreneurship courses)
▪ Number of employees:	University: Total 1998, teaching & research staff 1550, administrative staff 448 Economic Faculty: Total 100, teaching & research staff 65, administrative staff 35 Entrepreneurship education team: Total 16.5, teaching & research staff 15, administrative staff 1.5
▪ Budget in most recent financial year (2013):	University: 60 million EUR (or 450 million HRK) Economic Faculty: 7.7 million EUR (or 57.5 million HRK)
▪ Academic profile:	11 faculties, 5 departments, academy of arts
▪ Entrepreneurial profile:	Undergraduate, graduate, postgraduate, doctoral EE programme and EE courses for faculty and university students
▪ Activities focused in this case study:	Drivers and barriers of developing EE from scratch over time
▪ Case contact person(s):	Gatekeeper: Prof. Slavica Singer (professor emeritus)

Information included in this case study is from end of year 2014 unless stated differently.

16.1. The university's entrepreneurship education profile

16.1.1. The university's overall approach to entrepreneurship

The Josip Juraj Strossmayer University in Osijek (SUO), Croatia, has approximately 20,000 students. Osijek has 108,000 inhabitants and is thus the fourth-largest town in Croatia, located in the North-East of the country, close to the border with Hungary, Bosnia and Herzegovina, and Serbia.

The overall objective of entrepreneurial education (EE) at the J.J. Strossmayer University in Osijek (SUO) is to **develop an entrepreneurial mindset** of being "proactive, innovative and responsible for your own choices" (Prof. Singer), as well as related skills. EE at SUO consists of an undergraduate programme, a graduate (master) programme, a postgraduate (specialist) programme and a doctoral programme. The offers are organised by the Faculty of Economics and its staff, which forms as a team a virtual unit: the International Centre for Entrepreneurial Studies (ICES). EE courses are offered to students mainly from the faculty of economics but also to students from other faculties. The programmes and courses are supplemented by extra-curricular activities including community work, an internationalisation programme "Entrepreneurs Without Borders", consulting activities and a business plan competition.

The degree programmes and the staff of the entrepreneurship team have a strong connection to the entrepreneurial ecosystem and related institutions in the University's environment. Key to the development of the programme and the entrepreneurial ecosystem has been the extraordinary engagement, the leadership and the personal skills of Prof. Slavica Singer.

The EE programme and the entrepreneurial ecosystem have been developed under **unfavourable economic and cultural conditions**. Low purchasing power, high unemployment (especially among young people) and a remote location characterise the economic situation in Osijek. The unfavourable situation is to a large extent, an outcome of the war in the 1990s. Furthermore, there is a negative connotation of the word "entrepreneurship" in Croatia. In the privatisation process following the system change in former Yugoslavia, some so-called "entrepreneurs" had used corruption to become the owners of formerly socially owned²⁷⁸ organisations. Furthermore, people's "post-socialist" mindset values a secure job in a governmental institution or a large enterprise more than being or supporting an entrepreneur.

16.1.2. Leadership and governance

Leadership of Prof. Singer

Prof. Slavica Singer has an academic background in economics and seven years of work experience as a Vice Manager in a big food company, responsible for operations management and economic analysis. During her work in the food company she was engaged as part time lecturer at SUO. She started teaching full time at the University in 1973 with an initial focus on **systems theory**²⁷⁹. This theoretical background – providing a holistic view on the economic system with different system elements influencing each other – can be seen as a basis for the development of the programme, the entrepreneurial ecosystem and its related institutions until today. Slavica Singer developed a broad vision to foster entrepreneurship and establish EE in Osijek and then implemented the different parts step by step.

Prof. Singer's motivation to introduce an EE programme originated from the frustration about the war for Croatian independence (1991 – 1995) and in solving the problem of **revitalising the economy after the war**. Since the large enterprises were vanishing and since the educational programme had been either neutral with regard to company sizes or focussed on big companies, she saw a need for the development of an education programme for small and entrepreneurial companies.

She operated according to what was later named the **effectuation principle**²⁸⁰ and according to the principle of subsidiarity. Beginning "with what you have", she did not expect much

²⁷⁸ The concept of socially owned businesses in former Yugoslavia meant that employees were responsible for all aspects of business life, including strategic and operational aspects as well as decisions about how to use profits. Due to this special feature of Yugoslav socially owned businesses, huge disappointments with "entrepreneurial" corruption and anger about the government not preserving the rights of employees contributed to a negative attitude towards entrepreneurs in general.

²⁷⁹ See von Bertalanffy (1968); Luhmann (1970); Schilling (2000).

²⁸⁰ See Sarasvathy, S. D. (2001); see also <http://www.effectuation.org>.

support from the outside. The principle of being “responsible for yourself and your own decisions” is one of the key elements of the entrepreneurial mindset she wanted and the EE programme today still targets to develop.

Other key personal capabilities for the development of the entrepreneurship programme and ecosystem were found to be her **networking capacity** and her **persistence**. Her networking capacity allowed her to establish relationships to other universities, to convince recognised international lecturers to support her, to receive funding and to build up a competent team of university lecturers. Due to her persistence, she managed to overcome barriers in the unfavourable economic and cultural environment at the university and in the ecosystem.

Historical barriers to entrepreneurship education

The first challenge for Prof. Singer trying to initiate the programme was to reach an understanding of entrepreneurship among the faculty members in order to attain a decision to start the programme. In the **university** and its environment there had been no knowledge about entrepreneurship and no real support for it. The colleagues asked at the beginning: “Why do you need entrepreneurship? We have management.” Prof. Singer overcame this barrier through “understanding and trust”. On one hand, she was “preaching” and explaining entrepreneurship. On the other hand, the faculty members also trusted her and let her try to start the programme.

The next barrier was the **approval of the Ministry** of Science and Education to start the Master programme in entrepreneurship. The national council for higher education in Croatia refused the proposal in June 1999, listing various reasons. The name of the programme “Entrepreneurial Management”, as well as the names of the courses were doubted; the conception of the programme towards SMEs and neglecting large companies was criticised; the use mainly of foreign literature, not being published by professors from Osijek was mentioned; and the University of Osijek was considered as being too small to handle the programme. Furthermore, the committee’s opinion was that entrepreneurs were born as “street smart people” and that entrepreneurship could not be taught. After the initial refusal there was a “fight” for more than one year in which Prof. Singer led the correspondence with the Ministry, being authorised by the Dean. Singer continuously provided arguments to the Ministry, including information about entrepreneurship and entrepreneurship programmes at American universities, which for her was the most important argument. It was due to her persistence that the last step in convincing the Ministry was successful. Notably, one individual had rejected the programme and had also written a considerable part of the negative feedback. Being informed about the name of the person, Singer discovered that this person had actually published a book on entrepreneurship and management with a title named in the same way. Making this a topic in the correspondence with the Ministry, the programme was finally approved.

In May 2000, one week after the approval by the Ministry, the entrepreneurial master programme started with the enrolment of the first students. The rapid start was possible because a group of students had been waiting for the programme for around two years for the programme to begin.

Importance of entrepreneurship in the university’s strategy and extent of high-level commitment

Today, EE plays an important role in the strategy that the new Rector, Prof. Dr. Željko Turkalj, and the University developed. He was appointed on 1st October 2013. Before, he had been the Dean of the Faculty of Economics, supporting Slavica Singer in the development of the EE programmes. He presented a programme to the Senate in his election process in which entrepreneurship was one of the points that were supposed to be part of the new strategy. In the official, hitherto existing strategy of the university 2011 – 2020, the topic of entrepreneurship was not mentioned explicitly.²⁸¹

Organisational implementation and level of autonomy to act

From the start, **autonomy** for Prof. Singer and the entrepreneurship team was high. The former Dean gave her almost full autonomy, trust and support signing the initiatives and proposals he had to sign. The current Dean continues this support. However, Prof. Singer stated that she had to “go through the wall” by herself, overcoming the most difficult barriers. Today, the decisions

²⁸¹ See SUO (2011).

for designing the courses and course contents are taken mainly by Prof. Singer and Prof. Suncica Oberman Peterka, the new head of the entrepreneurship programmes.

At the moment, the undergraduate, graduate and postgraduate entrepreneurship programmes as well as the academic EE team are formally embedded within the Faculty of Economics at the Chair of Economics and Management. The doctoral programme belongs to the International Centre for Entrepreneurial Studies (ICES)²⁸², a virtual unit anchored at university level. Despite not having its own, full financial autonomy, the EE team forms the virtual entrepreneurship unit ICES, with its own logo, website and vision,²⁸³ extending the vision of the Faculty of Economics (see also chapter 16.4.1). According to the current Dean, the EE team will also receive its own chair – since it cannot be comprehended that the EE team does not have its own chair although it was awarded the UNESCO Chair for Entrepreneurship in 2008.²⁸⁴

Over the years, the **international advisory board** has had a strong influence on course contents, pedagogy and methods. The board had been installed to institutionalise the relationships with a number of high-level international professors, among them Howard Stevenson from Harvard University who is the Board's President.²⁸⁵ The Board meets either in Osijek or by videoconference. In the beginning, board meetings took place more frequently than today.

16.1.3. Resources: people and financial capacity

The university started its entrepreneurship activities with very limited human and financial resources. This can be considered as the next challenge in the development of the programme, as Prof. Singer says: "We did not have money, we did not have people." At the beginning, the University received start-up funds of 200,000 US dollar from the Open Society Foundation in New York, by George Soros²⁸⁶. It was a necessary support, especially for bringing foreign lecturers into the programme. Since funding was still limited, however, many professors came without asking for fees and sometimes not even for the reimbursement of traveling costs. This was another essential support for the development of the programme. Today, some contracting lecturers from abroad are partially financially supported by the European Union's Erasmus programme. Nevertheless, some professors still receive only the travel expenses as reimbursement or they work completely on a voluntary basis.

The undergraduate and graduate programmes are mainly financed through the government. The postgraduate and the doctoral programme are based on fees. In the postgraduate programme the fee is 4,200 euro per student, in the doctoral programme 12,500 euro per student.

16.2. Entrepreneurship in curricula and teaching

16.2.1. Overview about curricular offers

Offers for the full range of degrees

The curricular offer in entrepreneurship education at SUO consists of an undergraduate programme for a Bachelor degree, a graduate (Master) programme, a postgraduate programme for a Croatian specific "University Specialist" degree, and a doctoral programme.

Exhibit 1-1 provides an overview about the most important offers. A detailed list of undergraduate and graduate courses can be found in the Annex of this case study.²⁸⁷

²⁸² See <http://www.ices.hr/en/>.

²⁸³ See <http://www.ices.hr/en/>.

²⁸⁴ See <http://www.unesco.org/en/university-twinning-and-networking/access-by-region/europe-and-north-america/croatia/unesco-chair-in-entrepreneurship-education-801/>.

²⁸⁵ See full list at <http://www.ices.hr/en/advisory-board/>.

²⁸⁶ See: <http://www.opensocietyfoundations.org/about>.

²⁸⁷ Course details for the postgraduate programme (specialisation) and the PhD programme can be found in the brochures, SUO-FE (2011) available at http://www.ices.hr/wp-content/uploads/2011/10/PSP-brosura-11_12.pdf and SUO-FE (2007-2009), available at <http://www.ices.hr/en/wp-content/uploads/2011/10/Brochure-doctoral-program.pdf>.

Exhibit 16-1: Overview about curricular offers in entrepreneurship education at the University of Osijek

No.	Name	Contents	Target group	Offered since [year]	No. of participants in 2012/13
Undergraduate					
1	Undergraduate programme in entrepreneurship – Bologna type (Bachelor degree)	Specialisation in entrepreneurship (programme participants) One compulsory course (entrepreneurship) for all enrolled students in economics Elective courses for other students at the Faculty of Economics One elective course for students across campus (entrepreneurship)	High school graduates, enrolled in the first year of economics (programme participants); students enrolled at the Faculty of Economics; enrolled students across campus	2006	24 (programme) 759 (other course participants)
Graduate					
2	Graduate programme in entrepreneurship – pre-Bologna (Master of Science degree)	Specialisation in entrepreneurship (programme participants) Elective courses for other students at the Faculty of Economics	Students with a professional background in small business, larger firms, banks, local government and education	2000 (ended in year 2009)	40 (2008)
3	Graduate programme in entrepreneurship – Bologna type (Master degree)	Specialisation in entrepreneurship (programme participants) Elective courses for other students at the Faculty of Economics	Bachelor degree students from any discipline; students with a professional background in small business, larger firms, banks, local government and education	2009	56 (programme) 406 (other course participants)
Postgraduate					
4	Postgraduate specialist studies – Bologna type (specialist degree)	Specialisation in entrepreneurship (programme participants)	Students with a professional background in small business, larger firms, banks, local government and education	2007	22 (2012), 7 (2013)
Doctoral					
5	PhD programme Entrepreneurship and Innovation	Organised classes, doctoral dissertation, elective Scientific and teaching activities	Students from diverse educational backgrounds	2010	30 (2010), 13 (2012)

Chronological development of EE at SUO

Before the war from 1991 to 1995, the University started with an entrepreneurship programme on undergraduate level in 1990. Because of the war and changes in the programmes, the programme disappeared until the year 2000.

The **graduate programme** (Master of Science degree) was chosen to be the first programme after the war, starting in May 2000.²⁸⁸ The reasons for choosing the master programme were the following. First, the programme could be realised with the help of foreign faculties and lecturers. Second, more students were interested in the Master programme than in the Bachelor programme. Third, for the doctoral programme there was not enough human resource capacity for mentoring and teaching. Moreover, Prof. Singer used the Master programme to build own staff for the entrepreneurship programme: "My idea was: If we start with the Master's degree, then we will develop a critical mass of people who will understand what entrepreneurship is and then a few of them would be interested to go for the [doctoral programme]. I saw it as the avenue for developing our own faculty. And it proved to be really like that." The programme was said to be very successful and due to high demand, there were two enrolments in some years.

The new **undergraduate programme** started in 2005 in line with the outcomes of the Bologna process²⁸⁹ with one obligatory course in entrepreneurship for all students and a complete programme for specialisation in entrepreneurship. The objective of the obligatory course was to start even earlier with EE and the development of an entrepreneurial mindset among students. The course is meant to make students in their first university year comprehend the meaning of entrepreneurship.

Implementing the new educational framework based on the Bologna process, the old (pre-Bologna) Master of Science entrepreneurship programme was split up into a two-year **graduate programme** (academic title: Master of Economics) and a 1.5-year **postgraduate specialist programme** in entrepreneurship (Croatian specific "University Specialist" degree). Due to high demand, the postgraduate specialist programme existed from 2007 until 2009 in addition to the former Master of Science programme, which ended in 2009.

The international and interdisciplinary **doctoral programme** "Entrepreneurship and Innovativeness" started in 2010. In this programme, enrolment is possible every second year. The basis for the doctoral programme was the EU-funded TEMPUS project in 2007 – 2009, in which five universities from five countries were involved: University of Turku (Finland, co-ordinator), Durham University (UK), University of Maribor (Slovenia), Alpen-Adria University Klagenfurt (Austria) and SUO from Croatia. Turku University took the lead in the project. The original project target was to offer a joint degree programme, with one degree for all five universities. This was not achieved due to differences in national regulatory systems. Therefore, a programme was created in which the students receive their doctoral degree at the university where they are enrolled. Those who want to take doctoral courses at another university are able to do so without paying additional fees, based on a signed agreement among the universities involved.

16.2.2. Target groups

Overview about target groups

Generally, the target groups of the EE programmes at SUO are not only students with studies in economics. In order to spread the entrepreneurial mindset further, the objective is to offer EE to all students of the university. Postgraduate participants with diverse educational backgrounds are also targeted. Currently, some students cannot attend EE courses for organisational reasons: Their faculty is too far away and their lecture times conflict with timing of EE offers.

Graduate programme in entrepreneurship – pre-Bologna (Master of Science degree)

²⁸⁸ See also EC (2012), p.35 for developments and changes in the programme.

²⁸⁹ The Bologna process was introduced into the Croatian educational system in 2005 and all higher educational institutions had to change their educational programmes accordingly. In general, it led to the following structure: Three years of undergraduate programmes, two years of graduate programmes and three years for postgraduate (doctoral) programmes. Higher education institutions could opt for a 3+2 (year), a 4+1, or a 0+5 formula for organising their undergraduate and graduate programmes. SUO redesigned its programmes using the 3+2 formula, including the EE programmes.

The initially intended target group in the first graduate programme of the year 2000 were owners or managers of small businesses. However, it turned out that students also came from the banking sector and from governmental institutions. The students from banking applied because they were dealing with small businesses and sought to know more about the functioning of those small businesses in terms of issues like business goals, strategies, organisational structures, finance, human resource management, and marketing. The students of the Master of Science programme from year 2000 to 2009 were on average 30 years old and had an average working experience of 6.7 years, with the majority (73%) having a background in economics (see details in the annex of this case study).

Undergraduate programme in entrepreneurship – after Bologna (Bachelor degree)

Target groups for this undergraduate EE offer are the following:

- For specialisation in entrepreneurship: enrolled students for Bachelor degree in the first year at the Faculty of Economics (high schools graduates).
- For one compulsory course (entrepreneurship) and further elective individual courses: enrolled students for Bachelor degree at the Faculty of Economics.
- For the elective course in entrepreneurship: all enrolled students across campus.

Most of the undergraduate students taking part in the programme have been enrolled full time (see further statistics in the annex of this case study).

Graduate programme in entrepreneurship – after Bologna (Master degree)

There are two target groups for the graduate programme after Bologna:

- For specialisation in entrepreneurship (entrepreneurship programme participants): Students across the campus or from other universities who have a Bachelor degree and want to participate in a graduate (Master degree) programme, including students with a professional background in small business, larger firms, banks, local government and education.
- For elective individual courses: Primarily students enrolled for a Master degree at the Faculty of Economics with other specialisations (e.g. marketing or finance) as well as other graduate level students from across the campus (e.g. from studies in agriculture, law, art, medicine, electrical engineering).

Most of the students of the graduate programme after Bologna have been enrolled full time (see further statistics in the Annex). In this programme, many students continue directly after finishing their Bachelor degree due to the lack of possibilities to find a job. This is problematic as they do not have enough practical experience and the programme design is based on the assumption that students already had some working experience. Prof. Singer remarked that the problem could be further augmented if there will be mixed groups of students with and without business experience, as it is expected.

Postgraduate specialist studies in entrepreneurship – after Bologna (specialist degree)

As a post-graduate programme after Bologna, the 1.5-year specialist programme, targets students from small businesses, larger firms, banks, and local government and education institutions. From 2010 onwards, the students were on average 32 years old and had an average practical experience of seven years. 55% of them had a background in economics. As in the graduate programme pre-bologna (Master of Science degree), all students enrol part-time as they continue working while taking part in the programme. However, the participant number has decreased in the past years (7 students in 2013, 22 in 2010). Prof. Singer explained this development by a generally decreasing interest in the post-graduate specialist level in Croatia. The business sector is not recognising this level of education, and formally for some people the title ("University Specialist") is not appealing enough.

PhD programme "Entrepreneurship and Innovation"

The doctoral programme is part-time, currently with a total number of 53 students (30 starting in 2010, 13 starting in 2012 and ten starting in 2014). Due to limited mentoring capacity, the enrolment in the doctoral programme will be limited to ten students in the future as in 2014. In the first two cohorts, the students were on average 38 years old and had work experience of 14 years; the majority (68%) had a background in economics. 10% were foreign students. One of them already defended her thesis, and four of them are in the process of defending their thesis.

16.2.3. Designing lectures and courses – basic curricular decisions

Teaching objectives

The two main ideas for designing the courses are the life cycle concept of ventures and the target to develop entrepreneurial mindsets and behaviour using a wide variety of different pedagogical methods.

With regard to the **life cycle concept**, the course content covers the foundation of a business, the initial development phase, the growth phase and the phase of maturity. The concept is applied to different functions, for example marketing, in which the activities differ by phase of a venture.

The second basic idea for designing the lectures is the target of developing an **entrepreneurial mindset** – i.e. being proactive, innovative and responsible for own choices. With regard to this idea, the focus is not only on the content, but also on the way and the methods through which the content is delivered. The professors use drama, role-play, practical cases, experiential learning and gaining experience from guest speakers and from practice. The target is to confront students with real problems from practice, not only with regard to the topic of entrepreneurship but also from a wider scope, discussing this problem in the classroom and with practitioners. For example, in business ethics, the students were confronted with real examples of ethical and unethical behaviour partly from Croatia, partly from other companies in the world.

Teaching methods

Globalisation is a specific topic in EE at SUO, in which the students have to be proactive in acquiring the knowledge to play a real life situation in a **drama**: First the students have to find people outside of the classroom with a non-economic background to do an interview with, for example, school teachers or physicians in a hospital. Then they conduct the interview on the topic of globalisation and the question of how it affects the interviewed person in his or her real life, and how this person anticipates or reacts to such changes. After writing a report on the interview, the students have to develop a drama in a small group presenting the topic of globalisation in different roles. Professor Allan Gibb, a former Professor of Small Business Management based in Durham, United Kingdom, and Joan Gibb, his wife, a drama teacher in Durham, introduced the drama approach. Several SUO lecturers from Osijek were “shadowing” them to acquire skills to use it as a teaching method. The students are very fond of this drama method as it provides real life experience while having fun. This was mentioned not only by Prof. Singer but also by an interviewed programme participant having used the drama method.

A key factor for the success of teaching and learning may be the method of **team teaching**. It is applied in almost all classes. Beside a University professor, a guest speaker is invited to join the class to give practical insights and to take part in the discussions. Further people with other backgrounds are invited, too. For example, the drama is explained by an actor as a guest speaker. All students interviewed for this case study asserted that team teaching in the programme is much more interesting than “ex-cathedra teaching”. It constitutes one of the key strengths of the EE programme and a main reason why they chose the programme.

The ideas for courses, course contents and **methods stem mainly from US universities**. SUO teachers learned about related approaches in visits to US universities, teacher training sessions, external lecturers or from other people in Prof. Singer’s network (see also the list in chapter 1.2.5.). For example, the model of team teaching was adopted from Prof. Jerome Katz, St. Louis University. The use of cases in teaching and the roleplaying method was learned at Harvard Business School in a teachers training event. In addition, the ICES advisory board helped to design the curricula and especially to choose new methods from a pedagogical point of view. “They pushed us strongly to experiential learning and team teaching [and] out of traditional classroom thinking” (Prof. Singer).

16.2.4. Instructors: teachers and mentors

Involving international experts

In a situation of limited human and financial resources, the interviewees characterised the SUO's strategy with regard to teachers and mentors by two elements: Involving external teachers, either internationally recognised professors or lecturers from practice, and building up internal competent staff.

At the start of the programme, no one from local University personnel was specialised in entrepreneurship. Thus, external experts like Allan Gibb from Durham University and Antti Paasio from the University of Turku did most of the teaching. Today, professors from abroad still play an important role, which is recognised by the students as a key strength of the programme. Additionally, as mentioned above, in those offers applying the concept of team teaching, an external lecturer from practice is present in almost all classes. Many of them are past students of the entrepreneurship programme.

Real entrepreneurs and guest speakers as teachers

The following entrepreneurs and practitioners deliver course contents as teachers. They share the offices with younger faculty members:

Name of entrepreneur/teacher	Company, position	Course
Natalija Pekic	Studio Karizma, interior studio, owner	Family Business
Igor Medic	Color Trgovina, Manager	Contemporary Business Models
Boris Lauc	FINA, Regional Centre Osijek, Director	Consultancy
Aleksandar Erceg	Kandit, Head of Purchasing Department	Franchising

Furthermore, 18 regular guest speakers complement the EE courses in the undergraduate and graduate programme in entrepreneurship (see full list in the Annex).

Mentors

All SUO professors and lecturers above assistant level are entitled to be mentors, i.e. on graduate level 25 lecturers and on postgraduate level 21 lecturers can be mentors. The mentors help students in their individual or team projects and in their individual final thesis. In mentoring students' projects, especially on graduate level, practitioners can also be involved as co-mentors. At the moment, four to five practitioners co-mentor students' projects. In the doctoral programme, mentors and co-mentors can be professors from other universities. In sum, 23 local and foreign lecturers (e.g. from the partner universities in Turku, Durham, Maribor and Klagenfurt) are involved as mentors for the doctoral students. For all degree levels, professors have quota limits. For example, at the doctoral level a professor cannot mentor more than four doctoral students at a time.

16.2.5. Management of entrepreneurial education

Internally growing competent staff

Prof. Singer's strategy was to build up local staff in the medium to long term to make the programme more stable and not dependent on foreign lecturers: "I think it is very good to have foreigners, but if you rely so heavily on them it is very fragile." In order to build up competent staff, the **method of "shadowing"** was used: Younger faculty members were assigned to experienced external lecturers, building up competence by visiting the classes and working together with the external lecturers. Until now, the unit has developed four associated professors in this way.

Another key element for teachers' development was training sessions carried out mostly by international staff, either in Osijek or abroad:

- 1998 – 2000: Consultancy training (Piotr Korynski, Open Society Institute, New York, Director of the Economic Development Programme), in Osijek.
- 2001: Case study teaching (Susan Harmeling, professional case writer for Harvard Business School), in Osijek.
- 2002: "Train the trainer" – Workshops on how to design a course, how to identify course outcomes, how to identify expected competences to be built (with Joan Gillman, University of Wisconsin Business School, US, and Deborah Laurel, independent consultant), in Osijek.
- 2004: Proactiveness and initiative in "authentic leadership" (Susan Skjei and Barbara Lawton, both Naropa University, US), combination of online and on-site education, in Osijek.
- From 2004 (on a yearly basis): Case study approach in "microeconomics of competitiveness", Prof. Michael Porter, at Harvard Business School, Boston, US.
- 2005: "Experiential Classroom" – a three day training programme for lecturers in entrepreneurship, at Syracuse University, US.
- 2008: "European Entrepreneurship Colloquium for Participant-Centred Learning (EECPCL)", at Harvard Business School, Boston, US.
- 2010 – 2012: European Entrepreneurship Education Summer School - three workshops: at the University of Turku, Finland, Aarhus Business School, Denmark, and J.J. Strossmayer University in Osijek, Croatia.

Prof. Singer emphasised that through those training events the EE teachers from Osijek gained valuable experiences. Many of the lecturers participated in several of the events.

Five younger faculty members also participated in several doctoral workshops around Europe during the work on their doctoral thesis. This helped them to formulate their research questions better and develop contacts (see list in the Annex).

16.3. Extra-curricular activities related to entrepreneurship education

Overview about extra-curricular activities

There are four major extra-curricular activities at SUO related to EE: community work, the initiative "Entrepreneurs Without Borders", consulting work and a business plan competition. Exhibit 1-2 provides an overview.

Exhibit 16-2: Overview about extra-curricular EE activities at the University of Osijek

No.	Name	Contents	Target group	Offered since	No. of participants
1	Community Work	Projects "Big Brother/Big Sister" and "Contribution to the Community".	Students from Faculty of Economics	2009	Average of 80 students per year
2	Entrepreneurs Without Borders	Projects to solve local economic and social issues, charity events, study trips	Students from all faculties	2009	Average of 50 students per year
3	Consulting	Consulting projects for small and medium-sized companies	Graduate and post-graduate students	2000	Average of 30 students per year
4	Business Plan Competition	Concept ideas, training on business planning, business plan competition	Students from all faculties	2012	Average of 30 students per year

Community work (Volunteering Programme of Graduate Programme in Entrepreneurship)

The Volunteering Programme of the Graduate Programme in Entrepreneurship (VpsP)²⁹⁰ was founded at the Faculty of Economics in Osijek in 2009. Its aim is to encourage students to behave proactively, to develop social responsibility as well as to develop knowledge and skills further. The two major activities of this programme are the projects "Big Brother/Big Sister" and "Contribution to the Community".

"Big Brother/Big Sister" is a project supporting mentorship between adults and disadvantaged children, using the format of an internationally known concept. The project was designed in co-operation with the children's home "Klasje" in Osijek. 15 students of the Faculty of Economics in Osijek help children of different ages in their everyday school obligations and socialisation. It is a voluntary programme that started as a part of the EE programmes and is open to all students now.

The project **"Contribution to the Community"** is designed as a mandatory part of the course "Entrepreneurial Skills I" at undergraduate level for students being enrolled in the entrepreneurship programme. Originally, the University started with offering real volunteer work. However, the students failed right at the beginning because they were not interested in volunteering. Therefore, community work is now obligatory for receiving the final grade and passing the course. However, Prof. Singer mentioned that many students continue the work on a voluntary basis after finishing the course.

Entrepreneurs Without Borders (EWOB)

Entrepreneurs Without Borders (EWOB)²⁹¹ is a non-governmental student-led organisation founded in 2008 at the University of Illinois in Urbana-Champaign, USA. The first partner chapter was established at the University in Osijek in 2009.²⁹² EWOB offers young people the opportunity to connect with communities around the world and develop business-based projects that solve local economic and social issues. Students from all faculties develop different types of projects and co-operate with local entrepreneurs through consultation projects and marketing plans. In addition, charity events and study trips to the USA and in Croatia are organised.

Consulting

Students finishing the graduate and postgraduate level can take part in consultancy work for small and medium-sized companies in the region. The activity was designed through learning from the curricula of similar programmes at the University of Wisconsin and the University of Illinois at Urbana-Champaign in the US. In Osijek, students are involved in consultancy work in three ways:

1. Through projects which are an obligatory part of specific courses (e.g. the course on growth strategies for SMEs).
2. On optional basis as part of other courses.
3. Through collaboration with the Centre for Entrepreneurship or the Legal-Economic Clinique, a joint project between the Law School and ICES.

An academic consulting company does not exist but is planned. Up to now, 415 students have participated in the activity, mostly pro bono. Seven students worked on a commercial basis on paid consultancy projects.²⁹³

Business Plan Competition

In 2012, the undergraduate programme in entrepreneurship joined the Richards Barrentine Values and Ventures Business Plan Competition at the Texas Christian University in Fort Worth, US. The business plan competition focuses on ideas that "impact society in meaningful ways. (...) Plans must demonstrate a societal or environmental need to be filled, as well as the profitability of the business"²⁹⁴. The business plan competition in Osijek started with the

²⁹⁰ See photos on <https://www.facebook.com/volonterivpspa>. The programme is led by Dr. sc. Julia Perić.

²⁹¹ See: <http://www.entrepreneurswoborders.org/>.

²⁹² The chapter in Osijek is followed, controlled and counseled by Prof. Sunčica Oberman Peterka and Dr. sc. Anamarija Delić.

²⁹³ The course is led by Dr. Anamarija Delić, Boris Lauc, MSc, and Zoran Mlinarevic, postgraduate student on specialization level. The work is partly done in cooperation also with visiting lecturers and experienced consultants, who are members of the UNESCO Consultancy group.

²⁹⁴ See <http://www.neeley.tcu.edu/vandv/>.

undergraduate programme in entrepreneurship at the Faculty of Economics but is open now for students from all faculties.²⁹⁵ Students in teams of not more than three apply with concept notes describing their ideas, and the jury – consisting of professors from the Faculty of Economics and local entrepreneurs – chooses the five best ideas. These students then pass a short training course about business planning. Afterwards they are obligated to develop and present their business plans. The jury elects the best business plan and the winning team is awarded a trip to the Texas Christian University in Fort Worth to participate in the business plan competition there.

16.4. Institutional aspects of entrepreneurship education

16.4.1. Organisational set-up and change of EE

Planned organisational changes to make EE available to all students

The SUO's EE team has two targets for the future: First, to include all entrepreneurial programmes at SUO in the University's International Centre for Entrepreneurial Studies (ICES), serving all students of the University and; Second, to develop ICES from its current status of a rather virtual unit that uses the staff and resources from the Faculty of Economics, to an organisational unit with its own staff and financial autonomy. The vision paper of ICES states that "we want to establish an international business school in entrepreneurship."²⁹⁶ The ICES logo, a giraffe, manifests the type of leadership and



culture in the entrepreneurial team: "Giraffes have long necks and a good overview; when sleeping they always have one eye open being alert, and they have the biggest heart of all animals" (Prof. Singer).²⁹⁷

The reason for seeking to include all EE programmes in ICES at University level is that all students could take part in the lectures. Prof. Singer referred to the Centre for Entrepreneurial Learning at the University of Cambridge as a role model, which provides entrepreneurial education for all students of the university.²⁹⁸ At the moment, some SUO students, for example from the Faculty of Engineering, do not have access to the programme mainly due to organisational reasons: The distance of 2 km between the two faculties is seen as too long and the lecture times conflict with each other. The target for the future is to have a location accessible to all students of the university, including engineering, to spread entrepreneurial mindsets among all students. In order to achieve this, the lectures are supposed to be held at certain times, which are blocked for the other faculties to have their faculty specific lectures.

Moreover, the change from the organisational level within the faculty of economics to the university level should support the view that entrepreneurship is not seen as a part of economics, which happens very often. As Prof. Singer said, "We would like to send the message that entrepreneurship is seen as interdisciplinary." The target to have a separate organisational unit on University level had been the target from the beginning of the programme. As the general environment was not supportive enough according to an interview partner, the programme had to start within the Faculty of Economics.

There is no top management position related to EE in the University's hierarchy.

Shifting EE leadership

Another challenge related to institutional development of the programme is the high dependency on one person, Prof. Singer. Although being Prof. Emeritus at the time of writing this case study, she is still active almost full-time, especially in the postgraduate and the doctoral programme. First steps have been taken to hand over the operations and make the offers sustainable. Prof. Suncica Oberman Peterka has the full responsibility for the entrepreneurial unit including administration and course planning. Prof. Peterka received a Master of Science degree as a student of the first cohort of the entrepreneurship programme.

²⁹⁵ The programme is led by Prof. dr. sc. Sunčica Oberman Peterka.

²⁹⁶ See <http://www.ices.hr/en/our-vision-2/>.

²⁹⁷ See <http://www.ices.hr/en/why-giraffes/>.

²⁹⁸ See <http://www.cfel.jbs.cam.ac.uk/>.

She was Prof. Singer's assistant and her doctoral thesis focused on the "entrepreneurial university".

Today Prof. Singer is not active anymore in the undergraduate programme. She mentioned the danger that team members need personal capacity for other obligations in the University and will hence not have enough time and energy for the development of the entrepreneurship programme. For example, Prof. Peterka is also Vice Dean of the Faculty and young professors have to publish scientific articles to progress in their career.

16.4.2. Legal barriers to EE

While Croatian higher education law is not a barrier to bringing guest speakers from the field in the classroom, it does not recognise adjunct professorship or professors from the field who can teach a complete course. This has been a legal barrier to the development of EE at SUO. According to Croatian law, it is not possible to be in charge of the whole course at the University without having a PhD degree. This makes the combination of academia and practice much more difficult. The University eludes the restriction by building tandems of academics and practitioners with various degrees of mutual engagement.

16.4.3. Developing entrepreneurial mindsets

According to Prof. Singer, a first step in developing entrepreneurial mindsets at SUO has been achieved: Everyone at the University – students, faculty staff and management – is aware that the EE programme as well as the related activities and organisations exist, and that these are also recognised internationally. Moreover, many members from different university units and other faculties (e.g. arts, electrical engineering, medicine) contact the EE team to develop projects related to entrepreneurship, of which some are already running. A good example is the business plan competition which started only for students in the EE programme. Now all SUO students can participate, leading to interdisciplinary teams in the competition.

In sum, although not everyone at SUO has developed an entrepreneurial mindset, the awareness of the need to develop entrepreneurial mindsets exists throughout the University.

16.5. Outreach to external stakeholders of entrepreneurship education

Initiating institutions for an entrepreneurial ecosystem on one's own

In addition to building up relationships with external lecturers, international universities, and local practitioners, Prof. Singer and her team engaged in founding institutions in the university's environment that are essential for developing an entrepreneurial ecosystem.²⁹⁹ This can be considered a special type of outreach: Since important external stakeholders to be reached out did not exist in the University's proximity, the university initiated their foundation. After the war from 1991 to 1995 there was no entrepreneurial ecosystem in place in the Osijek region. There were no government policies supporting entrepreneurship, no business incubators and no accelerators. "Those words were unknown to us 15 years ago", Prof. Singer said.

Most of the management positions in the following institutions are held by first cohort students from the SUO's EE programme. Prof. Singer believes that Osijek today is the Croatian region with the best entrepreneurial ecosystem.

Graduated EE students from SUO have taken managing positions or are in expert teams of various business support institutions around Croatia, e.g. at the Istrian Development Agency (Pula), in the Centre for Entrepreneurship (Pakrac) and in the Development Agency of Vukovar-Srijem County (Vinkovci).

Finance for local enterprises: NOA

²⁹⁹ See also EC (2012), p.35.

Recognising that there was a need for financing start-up and growth of local enterprises, Prof. Singer took a leading role in establishing the **microfinance institution NOA**.³⁰⁰ NOA was based on a donation from the USAID organisation and with the help of the Open Society Institute, New York, in 1996. There are estimations that NOA helped maintain approximately 3,500 jobs and create 1,500 new jobs in the Osijek region.³⁰¹

Currently the SUO's EE team is negotiating with Erste Bank Oesterreich, the oldest Austrian bank, in order to get seed money for entrepreneurial students in the future.

Entrepreneurship training: Centre for Entrepreneurship

Beside the challenge of financing new enterprises, there was also a need for training. Hence, the **Centre for Entrepreneurship**³⁰² was founded in Osijek in 1997. As the University at that time rejected the idea of the Centre for Entrepreneurship, it had to be founded outside. The Centre received an initial funding of 30,000 US dollar from the Open Society Foundation, by George Soros³⁰³. The original founders were Prof. Slavica Singer, Prof. Zeljko Turkalj (both from the Faculty of Economics), Prof. Vlasta Pilizota (Faculty of Food Technology), Zita Pleslic, Damir Taslidzic (business sector), Zlatko Benasic and Prof. Vilim Herman (local government). The Centre offers a variety of services for those who want to start a business or grow an existing one. Some of those services are free of charge support and training for entrepreneurs, for example in business planning. Until now 7,000 people have asked for advice and there are 200 regular users.³⁰⁴ Several EE teachers from SUO are actively involved in the training programmes of the Centre for Entrepreneurship. After the initial funding, the Centre was based on funding through projects, not depending on direct funding from the national or local Government. Currently, Ms. Darija Krstic, a former Master of Science and a recent PhD student in Entrepreneurship and Innovativeness, runs the Centre with a team of nine persons.

Policy think tank CEPOR

After launching EE at the University in 2000, the **policy think tank CEPOR** in Zagreb was founded in 2001 by several institutions, including higher education institutions, organisations supporting SMEs and associations of entrepreneurs. CEPOR connected with governmental organisations with the target of increasing policy support for entrepreneurship and SMEs.³⁰⁵ Several researchers and teachers from SUO are actively involved in CEPOR projects, especially in leading the Global Entrepreneurship Monitor survey for Croatia. CEPOR is run by Dr. sc. Mirela Alpeza, a former Master of Science and PhD student in entrepreneurship and innovativeness.

Business incubator BIOS

The **business incubator BIOS**,³⁰⁶ owned by the Municipality of Osijek, was founded in 1996. After more than five years of not really finding its role, it was revitalised in 2002 by engaging Igor Medic, at that time Master of Science student in entrepreneurship. BIOS provides space, production facilities and business related services to entrepreneurs. The Centre for Entrepreneurship and the University's EE team developed the business model for BIOS, with financial help from the Open Society Institute, New York. Today, BIOS is also led by Jean-Pierre Maricic, postgraduate student in entrepreneurship.³⁰⁷

Regional centre for promoting entrepreneurship

In 2002, Tera Tehnopolis, "a regional centre for promotion of research and innovative entrepreneurship"³⁰⁸ was founded through a co-operation between the University and the local government. It had the target to establish and develop a technological and science park in Osijek. In order to promote entrepreneurship, Tera Tehnopolis runs an idea competition event on an annual basis, supporting young people with innovative ideas.

³⁰⁰ See <http://www.noa.hr/>.

³⁰¹ See <http://www.ices.hr/en/how-it-all-started/>.

³⁰² See <http://www.poduzetnistvo.org/centar/>.

³⁰³ See: <http://www.opensocietyfoundations.org/about>.

³⁰⁴ See <http://www.ices.hr/en/how-it-all-started/>.

³⁰⁵ See <http://www.cepor.hr/en/about-us.html>.

³⁰⁶ See http://inkubator.hr/en_UK/.

³⁰⁷ See http://inkubator.hr/en_UK/about-us/bios-team.

³⁰⁸ SUO (2011), p.108.

Involvement of external stakeholders in university boards

In the official Board of the University, none of the EE guest speakers has a position. However, especially for EE programmes, an informal Board for the Dean exists, in which some of the guest speakers from the field are involved.

16.6. Impact and lessons learned

16.6.1. Measuring impacts of the entrepreneurship education approach

Overview about impact measurement methods applied

As regards **course evaluation** at SUO, there are two student surveys at the graduate level: one conducted by the University, the other by the Faculty of Economics. Both surveys take place at the end of the semester. However, the surveys do not include information about the entrepreneurial thinking and behavior of the students.

However, **ICES keeps track of a part of the EE alumni** – of those who respond to e-mails sent out by the unit. From the 360 students of the EE programmes (former Master of Science degree and postgraduate University Specialist degree) whose contact details are available to ICES, 39 students have their own business. Out of those, 16 were started during or immediately after the programme. All of the students were part-time students. At the time of studying, some were employed or already had their own business. Some businesses experienced either improvement or strategic repositioning during their owners' enrolment in the EE programme.

In addition, findings from the Global Entrepreneurship Monitor and qualitative individual statements substantiate the impact of the EE programmes and the team's activities, as described in the following.

Findings from the Global Entrepreneurship Monitor

Compared to the other parts of Croatia, the regions of Slavonia and Baranja, with Osijek as the largest city, have a higher motivation for entrepreneurial activity, seeing new businesses as an opportunity. This can be shown by analysing data from the **Global Entrepreneurship Monitor (GEM) for Croatia**:³⁰⁹ Despite having the lowest GDP per capita and the highest unemployment rate, the Osijek region is ranked first in motivation for entrepreneurial activity among the seven Croatian regions. Its entrepreneurial motivation index is 2.66, while the Croatian average is 1.78.³¹⁰ This was not always the case. Up to 2008, the motivation index in the Osijek region was below 1, for example 0.5 in 2006. This means that new businesses were born rather out of necessity due to unfavourable conditions.

However, the **Total Early-Stage Entrepreneurship Activity (TEA) index**³¹¹, which is part of the GEM, indicates for 2011 that in the region of Slavonia and Baranja the level of entrepreneurial activity is still lower (4.72) than in the other parts of Croatia (7.32). According to Prof. Singer, the level of entrepreneurial activity in Slavonia and Baranja was hit more strongly by the recession than in other parts of Croatia. The TEA index for Slavonia and Baranja was 8.84 in 2006, which was comparable to the Croatian average (8.58), catching up from a very low level in 2003 (Slavonia and Baranja: 1.00; Croatia: 2.56).

Qualitative substantiation of the impact of SUO's EE programmes

While data from GEM and TEA do not allow direct conclusions about impacts of the SUO's EE programme on the regional economy, individual statements may substantiate such an impact in a qualitative manner. One interviewee, for example, who took part in the first cohort of the Master programme, sold his former business and focuses now on a new one. Analysing his former business better and receiving advice from an external lecturer during the course, he realised that his business was not as profitable as he thought, and that he was not supporting it with full dedication. Another interviewee with a background in agricultural engineering started a

³⁰⁹ See Singer (2007), GEM (2012).

³¹⁰ See GEM (2012), p. 75. A high motivation index (TEA opportunity/TEA necessity) indicates that the businesses are created more seeing them as an opportunity rather than as a necessity for example due to unemployment, see Singer (2007), p. 11.

³¹¹ The TEA index shows percentages of adults aged 18 to 64 years who have businesses not older than 42 months, see GEM (2012).

consulting business next to his management job in a larger company. He acquired part of the financial skills and the University specialist degree with the programme. He stated that it paid off quickly because with the first consulting job he gained the sum he had paid for attending the EE programme.

In addition, the institutions established for developing an entrepreneurial ecosystem as well as their performance as described above (see section about "outreach") may likely have had a positive impact on entrepreneurial mindsets and behaviour in the Osijek region. Their viability indicates success in developing an entrepreneurial ecosystem in and around Osijek.

16.6.2. Lessons learned

One of the key lessons to be learned from the case of the University of Osijek is that **even in an economically and culturally unfavourable environment it is possible to establish an entrepreneurship education programme and to develop entrepreneurial mindsets.** Applying systems thinking and the effectuation principle with the leadership of Prof. Singer, the University has gradually built an entrepreneurship ecosystem and EE programmes despite limited resources. She brought recognised international lecturers to Osijek and developed her own, competent faculty staff. The Osijek case can thus be regarded as a role model for developing EE and an entrepreneurial ecosystem in other unfavourable environments.

Analysing the case from a human resource management perspective, it can be recognised that **the person responsible for the programme was the key to its development and the establishment of the related ecosystem.** In order to succeed in an unfavourable environment, the responsible person has to be entrepreneurial by him- or herself, proactive and resistant to failures and drawbacks. He or she must have networking and relationship building capacity and should be able to initiate enthusiasm among the team and the wider ecosystem with an entrepreneurial vision. In addition, the autonomy to act combined with trust and support, as received from the former Dean Prof. Dr. Željko Turkalj can be viewed as essential for the development of the entrepreneurship programme.

Furthermore, the **advisory board with experts from abroad proved to be a successful model** giving external advice of international best practice, pushing the team in Osijek towards changes in curricula, content and pedagogy. Such an advisory board – which might also include local entrepreneurs – could be a model for other universities.

Regarding EE itself, several aspects can be highlighted: The high amount of external lecturers from practice as well as from abroad using the method of team teaching increases the attraction of the programme for students, especially for those with work experience. Considering the restriction in current Croatian law on higher education that does not allow practitioners to teach full university courses unless they have a PhD, governmental institutions may be recommended to reconsider this barrier to EE. Moreover, the drama method can be seen as a good practice in EE.

Finally, the international approach of the doctoral programme can be regarded as especially valuable, with doctoral students taking classes at other European universities. An extension of this idea to European level with standards in doctoral classes, comparable to the ECTS system on the Bachelor and Master level, can be regarded as a development potential for other EU universities offering entrepreneurship education.

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- First interview: 27.6.2014, 8.30-10.00, Skype.

- Second interview: 2.7.2014, 8.00-9.00, Skype
- Third interview: 19.7.2014, 9.00-10.30, Hotel Waldinger, Osijek.
- Fourth interview: 27.3.2015, 8.00-9.00, Skype
- Prof. Dr. Zeljko Turkalj, Rector, 18.7.2014, 8:30-9.15, rector's office, Sv.Trojstva 3, Osijek.
- Prof. Dr. Vladimir Cini, Dean, 18.7.2014, 9.30 - 10.15, at the faculty of economics, Gajev trg 7, Osijek.
- Prof. Dr. Suncica Oberman Peterka, Vice Dean, responsible for the entrepreneurship programme and a student from the first cohort, 18.7.2014, 10.15 - 11.00, at the faculty of economics, Gajev trg 7, Osijek.
- Prof. Dr. Sanja Pfeifer, lecturer in the entrepreneurship programme, 18.7.2014, 11.15 - 12.00, at the faculty of economics, Gajev trg 7, Osijek.
- Dr. Anamarija Delic, lecturer and Mr.Sc. Darija Krstic, director of the Center for Entrepreneurship, both of them former Master of Science students in entrepreneurship, 18.7.2014, 12.00 - 13.00, at the faculty of economics, Gajev trg 7, Osijek.
- Mr.Sc. Gordan Sestic and Zoran Mlinarevic, entrepreneurs/business persons, former Master of Science students in entrepreneurship, 18.7.2014, 14.00 - 15.00, at the faculty of economics, Gajev trg 7, Osijek.
- Zeljka Getos, vocational school teacher, actual student in the postgraduate program and mr.sc. Viktor Vanek, business person, former Master of Science student in entrepreneurship, 18.7.2014, 15.15 - 16.15, at the faculty of economics, Gajev trg 7, Osijek.

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Annex

Course details for SUO's undergraduate and the graduate programme in EE

UNDERGRADUATE

Compulsory Courses

Entrepreneurship
Corporate Entrepreneurship
Entrepreneurial Skills I
New Venture Creation I
Family Business
Financing entrepreneurial venture
Human Resource Management

Electives

Sales Skills
Business Ethics
Credit Analysis
Entrepreneurial Strategies

GRADUATE

Compulsory Courses

New Business Models
Creativity and Innovativeness
Entrepreneurial Skills II
Presentation Skills
New Venture Creation II
Financial Management for Entrepreneurs I
Entrepreneurial Management
Operations Management
Growth Strategies of SMEs
Leadership

Electives

Business English I
Entrepreneurship without borders
Competitive Intelligence
Introduction to Entrepreneurship Research
Entrepreneurial Marketing
Entrepreneurial Accounting I
Statistical Methods in Market Research
Franchise
Entrepreneurial information systems
International business and logistics
Business negotiation
Family Business Management
Business intelligence systems
Entrepreneurial Accounting II
Financial Management for Entrepreneurs II
Credit scoring
Multimedia Marketing
Consulting for SMEs
Contemporary financial instruments
Competitiveness
Business data analyses
Entrepreneurship in agri business

Entrepreneurship in Family farms
 Entrepreneurship of Non-profit Organisations
 Entrepreneurship in tourism
 Economic theory of entrepreneurship
 E-business
 Business Ethics

Target Groups - Details

Graduate programme in entrepreneurship – pre-Bologna (Master of Science degree)

Enrolling in the graduate programme, the students had to fulfil the following requirements:

Bachelor degree students from pre-Bologna programme scheme (4 years of undergraduate program) from economics and law (direct enrolment), or from any other discipline with fulfilling the requirement of taking 2 to 4 additional courses (in economics) with the minimum average grade of 3.51 (span of grades: 1 - failure to 5 - excellent).

Split by the year and the type of enrolment, it can be seen that all the students were part time students, as it was not economically viable for them to enrol full time.

Graduate level	2000	2001	2002	2003	2004	2005	2006	2007	2008
	Number of students full time part time								
Entrepreneurship	0 24	0 26	0 31	0 20	0 21*	0 29	0 38	0 11*	0 40

*dislocated programme in Istria

Graduate students (pre-Bologna) can furthermore be characterised as follows:

Enrollment	Number of students	Age/ average	Working experience - years	Prior education %	Residence - %
2000	24	30	9,9	Economics 95,83 Engineering 4,17	Eastern Croatia 91,7 Northern/Western Croatia 8,3
2001	26	27,73	8,4	Economics 96,15 Engineering 3,85	Eastern Croatia 96 Northern/Western Croatia 4
2002	31	28,12	7,2	Economics 80,64 Engineering* Humanities* 19,36*	Eastern Croatia 96,66 Northern/Western Croatia 3,34
2003	20	31,15	7,8	Economics 75 Humanities* Engineering* 25* Biosciences*	Eastern Croatia 100
2004	21	31,95	10,9	Economics 52,63 Engineering* Humanities* 47,37*	Northern/Western Croatia 100
2005	29	26,76	7	Economics 72 Engineering* Humanities* 50* Bio-technical* Others*	Eastern Croatia 75,86 Northern/Western Croatia 3,45 Republic of Macedonia 20,69
2006	38	29	5	Economics 67 Engineering* Bio-technical 33* Humanities* Others*	Eastern Croatia 82 Northern/Western Croatia 5 Republic of Macedonia 8 Bosnia & Herzegovina 5
2007	11	30	6	Economics 43 Engineering* Humanities* 57* Others*	Northern/Western Croatia 100
2008	40	31	7	Economics 77 Humanities* Bio-technical 23* Engineering* Others*	Eastern Croatia 85 Northern/Western Croatia 15
TOTAL	240	29,52	6,7	Economics 73,25 Engineering* Humanities* Bio-technical* 26,75* Biosciences* Others*	Eastern Croatia 76,67 Northern/Western Croatia 18,75 Republic of Macedonia 3,75 Bosnia & Herzegovina 0,83

Undergraduate programme in entrepreneurship – after Bologna (Bachelor degree):

Most of the undergraduate students taking part in the programme have been enrolled full time, as the participant numbers show.

Undergraduate level	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	Total
	Number of students full time part time								
Specialisation in Entrepreneurship	28 3	61 13	51 12	71 9	28 7	24 3	21 3	16 7	300 57
Courses:									
Entrepreneurship – compulsory for all students from the Faculty of Economics	308 81	347 59	474 73	525 54	351 130	297 53	307 71	259 59	2868 580
Electives for all other students at the Faculty of Economics:									
Entrepreneurial Strategies	/	19 0	120 22	78 25	262 34	235 71	169 54	131 62	1014 268
Family entrepreneurship	/	177 23	39 4	39 8	54 5	32 10	23 8	19 24	383 82
Entrepreneurial Skills	/	23 5	37 4	44 7	69 6	/	/	/	173 22
Entrepreneurial Skills I	/	/	/	/	/	119 34	81 18	88 24	288 76
Entrepreneurship – elected by students from the Department of Culturology						50 0			50 0
Total							601 158		

Graduate programme in entrepreneurship – after Bologna (Master degree):

As well most of the students of the graduate programme after Bologna have been enrolled full time:

Graduate level	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	Total
	Number of students full time part time						
Specialisation in Entrepreneurship	18 0	26 3	27 0	58 34	37 19	39 10	205 66
Courses:							
Electives for all other students of the Faculty of Economics:							
New Venture II	18 0	26 3	27 0	58 34	37 19	39 10	205 66
Growth Strategies for SMEs	/	78 11	25 1	26 2	51 10	36 18	216 42
Entrepreneurial Skills	67 6	100 54	130 30	56 31	/	/	353 121
Entrepreneurial Skills II	/	/	/	120 99	127 106	121 64	368 269
Total					252 154		

Postgraduate specialist studies in entrepreneurship – after Bologna (specialist degree):

As the graduate programme after Bologna, the 1.5 year specialist programme targets students from small businesses, bigger firms, banks, local government and education having practical experience and but fulfilling the following higher level requirements:

Bologna Master degree students (3 years of undergraduate programme + 2 years of graduate program) and pre-Bologna Bachelor degree students (4-years study program) from economics and law (direct enrolment), or from any other discipline with fulfilling the requirement of taking 2 additional courses (in economics) with the minimum average grade of 3.51 (span of grades: 1 - failure to 5 - excellent)

As in the graduate programme pre-bologna (Master of Science degree), all the students enrol part-time as they continue working while taking part in the programme.

Post-graduate level (Specialist degree)	2007	2008	2009	2010	2011	2012	2013
	Number of students full time part time						
Entrepreneurship	0 33	0 35	0 29	0 22	0 27	0 22	0 7

Postgraduate specialists can furthermore be characterised as follows (average):

Enrollment	Number of students	Age/Average	Working experience - years	Prior education %	Residence - %
2007	33	30	6	Economics 50 Engineering* Humanities* 50* Bio-technical* Others*	Eastern Croatia 90,9 Northern/Western Croatia 9,1
2008	35	30	5	Economics 74 Humanities* Bio-technical* 26* Engineering*	Eastern Croatia 97,1 Bosnia & Herzegovina 2,9
2009	29	34	8	Economics 51 Engineering* Humanities* 49* Bio-technical* Others*	Eastern Croatia 96,55 Northern/Western Croatia 3,45
2010	22	31	7	Economics 70 Engineering* Humanities* 30* Bio-technical* Others*	Eastern Croatia 86,36 Bosna & Hercegovina 13,64
2011	27	32	6,25	Economics 55,55 Engineering* Bio-technical* 44,45* Biosciences* Humanities*	Eastern Croatia 100
2012	22	31	6,28	Economics 54,55 Biosciences* Humanities* 45,45* Bio-technical* Others*	Eastern Croatia 100
2013	7	33	10,28	Economics 28,57 Humanities* Engineering* 71,43* Others*	Eastern Croatia 71,4 Northern/Western Croatia 28,6
TOTAL	175	31,57	6,97	Economics 54,81 Engineering* Bio-technical* 45,19* Biosciences* Humanities* Others*	Eastern Croatia 94,3 Northern/Western Croatia 3,4 Bosna & Hercegovina 2,3

Postgraduate PhD programme "Entrepreneurship and Innovation":

The doctoral programme can be considered also as a part-time programme.

Post-graduate level (PhD degree)	2010	2012
	Number of students full time part time	
Entrepreneurship and Innovativeness	0 30	0 13

Further student characteristics of the postgraduate doctoral programme are the following:

Enrollment	Number of students	Age/Average	Working experience - years	Prior education %	Residence - %
2010	30	38	12,8	Economics 70 Engineering* Humanities* 30* Others*	Eastern Croatia 43,33 Northern/Western Croatia 43,33 Southern Croatia 3,33 Bosnia & Herzegovina 3,33 Finland 3,33 USA 3,33
2012	13	37,76	15,4	Economics 66,67 Engineering* Bio-technical* 33,33* Humanities* Others*	Eastern Croatia 38,46 Northern/Western Croatia 30,77 Southern Croatia 15,39 USA 7,69 South Africa 7,69
TOTAL	43	37,88	14,1	Economics 68,34 Engineering* Bio-technical* 31,66* Humanities* Others*	Eastern Croatia 44,4 Northern/Western Croatia 37,2 Southern Croatia 6,9 Bosnia & Herzegovina 2,3 Finland 2,3 USA 4,6 South Africa 2,3

Doctoral workshops of younger faculty members

Doctoral workshop at the Babson Research Conference, Glasgow, 2004

„Research Methodology and Techniques“, doctoral workshops, Gate2Growth Academic Network in Entrepreneurship, Innovation and Finance, 2004, 2005, 2006 (Vlerick Management School, Nottingham University Business School, IESE Barcelona)

ESU – European Summer University on Entrepreneurship Education Research, University of Tampere, Hameenlinna, Finland, 2006

EFMD doctoral workshop, at the EISB conference, Ljubljana, 2007

Doctoral seminar, at the PODIM Conference, Maribor, 2009

Entrepreneurship Education and the Doctoral Student, Centre for Entrepreneurial Learning, Durham University, as part of the ICES project, 2010

DREAM Doctoral Retreat / Seminar on Entrepreneurship as Making, led by Saras Sarasvathy, Osijek, 2010

Regular guest speakers in the undergraduate and graduate programme in entrepreneurship

No.	Name of the guest speaker	Company
1.	Aleksandar Paradinovic	HEP d.d., (Croatian Electro Energy Company) engineer
2.	Darija Krstic	Centar za poduzetnistvo Osijek

		(Center for Entrepreneurship Osijek), director
3.	Dario Vukovic	Metronet d.d., owner
4.	Dusko Kostic	Association „Luna“ - NGO
5.	Gordan Sestic	Intuit d.o.o., owner
6.	Ivan Matejasic	SPIN Informatica d.o.o., owner
7.	Ivan Saric	Hrvatska udruga poslodavaca (Croatian Employers Organization), advisor
8.	Jelena Kamenko	Volunteer Centre Osijek – NGO
9.	Marijana Bosnjak	Kinematografi Osijek d.o.o., director
10.	Mijo Roncevic	Roncevic i dr. j.t.d. Osijek, owner
11.	Miroslav Varga	Escape d.o.o., IT expert
12.	Nikoleta Poljak	Association „Salter“ – NGO
13.	Predrag Dotlic	Jelovica d.o.o., owner
14.	Tomislav Bilic	Inchoo d.o.o., owner
15.	Tomislav Buljubasic	Siemens d.d., IT expert
16.	Zarko Gajic	Mono d.o.o., owner
17.	Zeljko Erkapic	Klaster poljomehanizacije d.o.o. (Agricultural Equipment Cluster Ltd), director
18.	Zoran Mlinarevic	Hrvatska lutrija d.d. – Regional center, director

17. University Rotterdam, Netherlands: Building the Erasmus Centre for Entrepreneurship and advancing corporate entrepreneurship

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Abstract



Erasmus University Rotterdam has a long track record in entrepreneurship teaching and research, notably both in entrepreneurial management and also in the economics of entrepreneurship through its Rotterdam School of Management and Erasmus School of Economics. The central hub for extra-curricular entrepreneurship education, training, and coaching offers is the new Erasmus Centre for Entrepreneurship within the university. Erasmus University has recently expanded its already well-established entrepreneurship education profile by adding corporate entrepreneurship to its agenda of master degree programmes in entrepreneurship and targeting small business owners and corporate intrapreneurs also in its entrepreneurship training offers within the entrepreneurship centre. This entrepreneurship portfolio and the organisation of corresponding education activities in cooperation with a community of entrepreneurs contribute to the valorisation of the university's expertise in entrepreneurship through the Erasmus Centre for Entrepreneurship. This provides instructive insights and options for transfer to one's own university in terms of further developing existing curricular entrepreneurship programmes as well as building self-sustainable entrepreneurship centres based on a resource-efficient set-up of premium education activities together with external entrepreneurs as educators.

Case study fact sheet

▪ Full name of the university and location:	Erasmus University Rotterdam, Rotterdam, Netherlands
▪ Legal status	Public
▪ Location:	Rotterdam
▪ Year of foundation:	1973
▪ Number of students:	22.367
▪ Number of employees (broken down by teaching, research and administrative staff):	2.817 (faculty and support staff; total)
▪ Budget in most recent financial year:	545 Million euro
▪ Academic profile:	The university is home to the Erasmus School of Economics, Erasmus Law School, the Faculty of Social Sciences, Faculty of Medicine and Health Sciences, Faculty of Philosophy, the Erasmus School of History, Culture and Communication, Rotterdam School of Management, and the International Institute of Social Studies (http://www.eur.nl/english/eur/organisation/).
▪ Entrepreneurial profile:	Erasmus University Rotterdam offers entrepreneurship master programmes in both entrepreneurial management and economics and has an excellent ranking in entrepreneurship research. Extra-curricular entrepreneurship activities are hosted by the university's Erasmus Centre for Entrepreneurship.
▪ Activities focused in this case study:	Advancement of curricular corporate entrepreneurship master (including a new business development course with external business entrepreneurs); institutional establishment of a self-sustainable entrepreneurship centre through scalable entrepreneurship education and training offers (the Get Started programme to coach start-up founders is discussed in detail)
▪ Case contact person(s):	Ferdinand Jaspers, Erasmus Centre for Entrepreneurship

The status of information provided in this case study is February 2015 unless stated differently.

17.1. The university's entrepreneurship education profile

17.1.1. The university's overall approach to entrepreneurship education

In the history of Erasmus University Rotterdam the business community of the City of Rotterdam and individual entrepreneurs played a central role in the university's initial foundation back in the early days of the 20th century – and today entrepreneurship at Erasmus University builds on its humanistic entrepreneurial tradition with the mission to *empower entrepreneurs* (Erasmus Centre for Entrepreneurship, 2013). In terms of entrepreneurship education (EE) in particular, the university has a unique and strong footprint in teaching and research of entrepreneurial management as well as entrepreneurial economics through the Rotterdam School of Management (RSM) and the Erasmus School of Economics (ESE). The established undergraduate and postgraduate degree programmes in entrepreneurship are without doubt insightful on their own terms.³¹² The case will zoom in on the rationale of further developing an entrepreneurship teaching profile with a new master programme in Strategic Entrepreneurship. This programme also takes corporate entrepreneurship on board and addresses new target groups for EE such as small business owners, corporate intrapreneurs, and innovation or business development managers.

Integrating corporate entrepreneurship to the curricular and extra-curricular teaching and training portfolio in addition to start-up entrepreneurship is also a key aspect for the university's new Erasmus Centre for Entrepreneurship (ECE). ECE is a company fully-owned by the university and serves as the central hub for entrepreneurship on campus in close cooperation with RSM and ESE. At the same time, ECE's path towards becoming a self-sustainable entrepreneurship centre funded internally through its own extra-curricular education and service offers is very informative (see 17.4 further below). ECE's entrepreneurship training and coaching formats are delivered together with a community of entrepreneurs and other stakeholders contributing to the hands-on and practice-oriented approach in extra-curricular EE within the centre (17.3). In sum, this case is about recent change in terms of further development of curricular entrepreneurship programmes within university faculties and establishing extra-curricular entrepreneurship training in an entrepreneurship centre in close cooperation with a community of entrepreneurs.

17.1.2. Leadership and governance

Importance of government strategies

In the second half of the last decade, the Dutch government supported the establishment of entrepreneurship centres at higher education institutions in a number of different regions and education institutions of the Netherlands, with Erasmus University Rotterdam amongst them. For the province of Zuid-Holland (South Holland) Erasmus University co-operated with two other universities, Delft University of Technology and Leiden University, in a programme called HOPE (Holland Program on Entrepreneurship (<http://hope-rdam.nl/>); HOPE Entrepreneurship, 2011). Although the organisation of the entrepreneurship infrastructure changed significantly with the advent of the ECE in 2013 (see 17.4.1 on organisational change), the HOPE programme has been instrumental in funding some of the university's and ECE's extra-curricular entrepreneurship education activities. Today, one of the entrepreneurial objectives is to run the ECE on a self-sustainable economic fundament in close co-operation with the university, however, without taxpayers' money from the public part of the university.³¹³

Importance of entrepreneurship in the university's strategy

Reportedly, the ECE has been created in a bottom-up initiative by entrepreneurial students, graduates, and academic staff with the university – as an education institution – buying into the centre's mission to “empower entrepreneurs” (ECE, 2013) in a people-oriented approach.

³¹² In 17.2 below the degree programmes and one course in the entrepreneurship master will be discussed in detail.

³¹³ Note though that public funds, e.g. from the EU, have been employed to finance the initial establishment of the centre's operations in 2013 and 2014.

Further, strategies implemented by ECE to valorise education activities (e.g. offering entrepreneurial training and consulting to business entrepreneurs) becomes increasingly important for the faculties of Erasmus University (e.g. the Medical School and the Rotterdam School of Management) as government funding for regular (curricular) education activities decreases. For this valorisation, ECE's community of entrepreneurs taking entrepreneurship education is an important target group (<http://ece.nl/community/community-updates/>; also see 17.3 and 17.4.1).

Level of faculties' and units' autonomy to act

ECE as the central entrepreneurship unit of the university is fairly independent in organising and running its entrepreneurship activities – “university leaders gave us the opportunity to build the ECE...and provided a mandate to do things” as one interviewee phrased it. At the same time, ECE has been set up as a company fully-owned by the university. Through ECE's board of directors, which includes the deans of the RSM and ESE, the centre is firmly anchored also at the faculty level. In fact, the link to RSM and RSE is essential for the validation and reputation of ECE's activities (e.g. the design of entrepreneurial training programmes with academic experts in the field of entrepreneurship from the management and economics faculties).

Organisational implementation

With the recent establishment of the ECE as a hub within the university, entrepreneurship is now organised centrally (see 17.4.1 for this development). Most importantly, ECE organises, operates, and markets all extra-curricular entrepreneurship education activities under one common ECE brand in co-operation with the business and economics faculties who run their curricular entrepreneurship modules and degree programmes (see 17.2). The centre also provides facilities to accommodate start-up businesses, host events on the ECE campus in the Rotterdam Science Tower (17.3.4), and teams up with the ECE students association to bring entrepreneurship to Erasmus University students on campus. The strategic implementation of ECE has been to build a show case of an up-and-running entrepreneurship centre in co-operation with two departments (RSM and RSE) and to take things from there to get other university departments on board as their students show an interest in entrepreneurship.

17.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

Given that Erasmus University has a long-standing tradition and track record in entrepreneurship, both in entrepreneurial management and economics, there are numerous faculty members involved in teaching and researching entrepreneurship in different degree programmes (<http://www.erim.eur.nl/centres/entrepreneurship/people/> and, in particular for the university's prominence in applied entrepreneurship research, <http://www.erim.eur.nl/centres/entrepreneurship/news/detail/3469-erasmus-university-rotterdam-ranked-first-in-research-on-entrepreneurship/>). The extra-curricular activities run by ECE are supported by the centre's management and operative team of around ten people (<http://ece.nl/about/the-team/>) and the entrepreneurship faculty.

Financial resources for entrepreneurship education

Most importantly, the entrepreneurship centre aims to run its activities on a self-sustainable basis by offering paid education formats (e.g. entrepreneurship trainings) and renting out its facilities to business. Initial public funds from the EU have been employed to set-up the centre and finance growing education formats to run on a sustainable basis in the future (see 17.4.1). Curricular entrepreneurship education at the faculty level is supported by regular government funding and tuition fees of enrolled students.

17.2. Entrepreneurship in curricula and teaching

17.2.1. Overview about curricular offers

As a Continental-European institution of higher education Erasmus University Rotterdam has a long tradition in offering entrepreneurship education to students on campus as well as to the wider community of entrepreneurship stakeholders. Regarding curricular entrepreneurship,

Erasmus University offers entrepreneurship electives at the bachelor level and fully-fledged master programmes in entrepreneurship for postgraduate master students.

For *bachelor* students at Erasmus University, the Rotterdam School of Management and the Erasmus School of Economics offer two campus-wide electives to undergraduates (minors in entrepreneurship): a) Minor *Entrepreneurship and New Business Venturing* and b) Minor *Entrepreneurship in the Modern Economy* (see <http://www.eur.nl/minor/minoren/faculteit/>).

A notable characteristic of entrepreneurship at Erasmus University is the strength of its teaching and research faculty being well versed and established in both entrepreneurial management as well as entrepreneurial economics (see <http://www.erim.eur.nl/centres/entrepreneurship/people/> for the breadth and depth in entrepreneurship research within in the Erasmus Centre for Entrepreneurship Research comprised by faculty from both RSM and ESE). Correspondingly, entrepreneurial management and economics *master* programmes are well established in *Strategic Entrepreneurship* (offered by RSM; <http://www.rsm.nl/master/msc-programmes/msc-strategic-entrepreneurship/>) and *Entrepreneurship and Strategy Economics* (by ESE; http://www.eur.nl/eese/prospective/master/master_programmes/msc_in_economics_and_business/entrepreneurship_and_strategy_economics/) as well as in *Cultural Economics and Entrepreneurship* (at the Erasmus School of History, Culture and Communication, ESHCC; <http://www.eshcc.eur.nl/english/culture/maacs/>) (ECE, 2013). A selection of important curricular EE offers (at the course level) is provided in the exhibit below.³¹⁴

Exhibit 3: Overview about curricular EE offers at the Erasmus University Rotterdam

No.	Name	Objectives	Target group
1	New Venture Creation (RSM; Master <i>Strategic Entrepreneurship</i>)	After the course students will a) know what elements make up a start-up business plan, and they will understand how (and to what extent) these elements interrelate, b) understand the inherent uncertain and iterative nature of the business modelling process, c) be able to apply numerous tools, techniques, and theories to develop a comprehensive and coherent value proposition and business model, and d) be able to develop and discuss their arguments and findings in a multidisciplinary student team as well as in a professional context of business relationships (e.g., mentors, investors, internal stakeholders, etc.)	RSM master students in Strategic Entrepreneurship and other RSM master programmes
2	Entrepreneurial Strategies (RSM; Master <i>Strategic Entrepreneurship</i>)	The course provides students with a) the knowledge and ability to recognise, understand, and apply main strategies that individuals and organisations use to exploit opportunities (based on projects with real entrepreneurs) and b) a better understanding and appreciation of the usefulness and limitations of entrepreneurship theory in real-life situations	RSM master students in Strategic Entrepreneurship
3	Economics of Corporate Entrepreneurship (ESE; Master <i>Entrepreneurship and Strategy Economics</i>)	Introducing students to a) the challenges of organising and managing research in established firms, b) the implications of corporate entrepreneurship for industry evolution, and c) the role of public policy in determining the success of corporate entrepreneurship	ESE master students in Entrepreneurship and Strategy Economics
4	Economics of Entrepreneurship (ESE; Master <i>Entrepreneurship and Strategy Economics</i>)	Students learn to assess the effects of entrepreneurship on the economy and society in terms of outputs and functions; also students learn about the determinants and drivers of entrepreneurial behaviour from an economics perspective	ESE master students in Entrepreneurship and Strategy Economics
5	Getting Started: An Effectual Approach & Entrepreneurial	Develop an entrepreneurial mind set in students, in particular for identifying and evaluating new business opportunities; students experience the whole	Bachelor students at Erasmus University

³¹⁴ The course descriptions in the exhibit are based on the corresponding syllabus texts from the websites of Erasmus University's master programmes and bachelor minors in entrepreneurship.

	Marketing (RSM; Bachelor Minor <i>Entrepreneurship and New Business Venturing</i>)	entrepreneurial process, plan their own business, and learn to handle starting-up and venture marketing on a limited resource base	
6	Essentials of Small Business Management & Entrepreneurship (ESE; Bachelor Minor <i>Entrepreneurship in the Modern Economy</i>)	The ESE entrepreneurship minor offers a bird's eye view on the role of entrepreneurship in the economy and in society; from a managerial economics perspective, students also learn how to evaluate and write business plans for new ventures or small businesses at the micro level; at the macro level students gain insights into entrepreneurship policy and the characteristics of an entrepreneurial economy	Bachelor students at Erasmus University

As noted in the introduction to EE at Erasmus University in section 17.1.1, its EE positioning has been changed recently. In particular, the flagship M.Sc. programme in entrepreneurship run by the RSM faculty has been adapted and renamed from "Entrepreneurship and New Business Venturing" to "Strategic Entrepreneurship". The rationale behind this repositioning in terms of the university's intentions towards curricular EE is addressed in section 17.2.3. The context of overall organisational change in its approach towards entrepreneurship with the new Erasmus Centre for Entrepreneurship at the university is discussed in 17.4.1. Extra-curricular education with regard to new venture creation and start-up support in the first place is now domiciled within the entrepreneurship centre (see section 17.3.3). The focus of the new strategic entrepreneurship master effective from spring 2015³¹⁵ is more on corporate entrepreneurship, in particular including business development and innovation in existing businesses and established corporations. Within the main part of this chapter on central decisions in the design of curricular EE offers (section 17.2.3), the focus will be on this change. In particular, the case study is to portray one of the elective courses in the strategic entrepreneurship master – "New Business Development (NBD)".³¹⁶ The NBD course is an example of the approach of Erasmus University – and in particular of the ECE and RSM – to actively involve the community of entrepreneurs in teaching based on real business development challenges from (corporate) entrepreneurship.

17.2.2. Target groups

Main target groups of entrepreneurship education

Erasmus University serves the wider community of entrepreneurs (or those interested in establishing and growing their own business) as well as students at the university (ECE, 2013). The extra-curricular training and education services offered to people from outside the university (and some also for internal students, e.g. the Get Started programme) will be discussed in detail in 17.3 below. In terms of (potential) internal participants in curricular EE on campus the entrepreneurship-related bachelor electives are offered for students from all disciplines within Erasmus University; namely, these are the entrepreneurship minors offered by RSM (Entrepreneurship and New Business Venturing³¹⁷) and ESE (Entrepreneurship and the Modern Economy³¹⁸). The entrepreneurship minors are part of a rich set of minor electives to be chosen from by bachelor students at the university (see <http://www.eur.nl/minor/minoren/faculteit/>). In the interviews it was reported that ECE is in the process to establish or has recently established further entrepreneurship minor electives in collaboration with different Erasmus faculties and schools, such as Erasmus University College.

At the post graduate level the distinct entrepreneurship masters at RSM and ESE are offered for students having finished their first degree and seeking further training and education. Some of the electives in these master programmes are also open to other master students from the

³¹⁵ See <http://www.rsm.nl/master/msc-programmes/msc-strategic-entrepreneurship/> again.

³¹⁶ The "New Business Development" master course has in fact also been part of the former entrepreneurship master programme in new business venturing. This is also why it has been selected as a course to be presented in detail based on an established course history.

³¹⁷ See <http://www.eur.nl/minor/minoren/faculteit/rsm/entrepreneurship/>.

³¹⁸ See <http://www.eur.nl/minor/minoren/faculteit/ese/entrepreneur/>.

same faculty, providing access to entrepreneurship also for students outside the main entrepreneurship masters. Typically, the master programmes at RSM and ESE are fairly international in terms of their respective groups of students and programmes are offered in English.³¹⁹ For example, in the most recent year of study in the RSM entrepreneurship master (57 students) around one-third of students had an international background.³²⁰

Continuous education

ECE and Erasmus University offer a wide range of further education formats for people coming back to university to learn about entrepreneurship and undertake training, e.g. in entrepreneurial management; these offers are mainly extra-curricular and will be addressed in 17.3 below. As regards curricular EE, commonly, business and economics master programmes are offered as formats of further education. In principle, this is also the case for the Strategic Entrepreneurship and Entrepreneurship and Strategy Economics master programmes of RSM and ESE; note though however, that these degree courses are also conceptualised as pre-experience masters for students continuing postgraduate education immediately from their bachelor studies.

17.2.3. Designing lectures and courses – basic curricular decisions

Intentions

Curricular entrepreneurship education at Erasmus University in general has been centred mainly on start-up creation, development, and economic policy support in the past. This has been with a focus on creating awareness for entrepreneurship as a career option and its role in the economy at the *bachelor* level (Erasmus Centre for Entrepreneurship, 2013). The focus also includes developing a portfolio of entrepreneurial skills to support student entrepreneurship through a practice-oriented curriculum combining “thinking and doing” within the RSM entrepreneurship *master* programme (<http://www.rsm.nl/master/msc-programmes/msc-strategic-entrepreneurship/>). Supporting nascent and early-stage student entrepreneurship is, of course, still supported and in the focus of the university – the creation and support of growth-oriented ventures is now organised within the ECE (see 17.3.6). However, the positioning of the curriculum of the master programme at RSM has shifted towards corporate entrepreneurship and entrepreneurial strategy in the context of established firms (this is the new M.Sc. in Strategic Entrepreneurship). This curricular change within the degree programme has reportedly been initiated to meet the needs of students and companies: alumni of the programme were found to frequently have corporate entrepreneurship careers (rather than founding their own business), working in innovative entrepreneurial roles in SMEs or larger companies (e.g. in innovation management or corporate business development)³²¹. Therefore, including elements of corporate entrepreneurship in the curriculum, fits with the training needs of both students and companies.

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The focus of the case study is more on the institutional establishment and extra-curricular EE activities of the ECE; however, as noted in the overview above, also the *New Business Development course* will be presented in detail as an example from the M.Sc. in Strategic Entrepreneurship offered by RSM at Erasmus University. To put the course in context, the master programme itself is based on a one-year programme of study designed as a pre-experience master (60 ECTS) with core courses in the first half and a choice of electives in the second half of the programme. The course “New Venture Development” is one of the electives in the Strategic Entrepreneurship master but may also be chosen by students from other M.Sc. programmes at RSM (see <http://www.rsm.nl/master/msc-programmes/msc-strategic-entrepreneurship/curriculum/>).³²² Most students will, however, come from the entrepreneurship master and the course typically has around 40 participants.

³¹⁹ Bachelor studies in the area of management and economics are offered both in Dutch and English with the entrepreneurship minor electives usually being offered in English (since they are open to bachelor students from different faculties).

³²⁰ See <http://www.rsm.nl/master/msc-programmes/msc-strategic-entrepreneurship/factsheet/>

³²¹ This was discussed in the on-site interviews; see also <http://www.rsm.nl/master/msc-programmes/msc-strategic-entrepreneurship/your-future-career/>

³²² Master students at RSM may choose one elective from another master programme.

The focus throughout the course is on students to master real-life business development projects in teams in co-operation with external companies (see <http://www.rsm.nl/master/msc-programmes/msc-strategic-entrepreneurship/curriculum/> for examples). For instance, past projects have been provided by the research institute TNO. In these projects students were asked to find promising applications for patented technologies. In one case, students even managed to initiate a joint-venture between a large company and TNO for the commercialisation of a patent. A further selection of participating firms includes Heijmans, Philips, IHC Merwede, and many SMEs. The main outcomes of coursework of the student teams together with their company coaches are the finalisation of a written business development plan as well as interim and final management presentations on the evaluation and exploitation of the challenging new business opportunities set at the start of the course. In particular, such business opportunities centre on the ambitions of participating companies to grow their business in the context of product/ service innovation or general business model change.

The input of business opportunities will be organised in advance before the course starts by the course co-ordinator of RSM. This input stems from the faculty's network of entrepreneurs and businesses that work together with RSM and ECE. Student projects can be with a range of companies, both larger multi-national enterprises and SMEs, or start-up firms. Students will get an initial idea of the project challenges before the course kicks off, based on one-pagers describing the business development challenge and the expectations of the company. Student teams will be formed by the course coordinator from the university based on students' preferred projects. However, team selection will also appreciate student business expertise and aim for a maximum of team diversity also in terms of study background, gender, and nationality. Setting of business development projects and team establishment are organised before the start of the course in order to ensure effective use of time during the course for the business challenge itself and the collaboration with the companies involved.

During the course students will meet and work together with designated company coaches who will be entrepreneurs/ founders or business managers involved in business development and product/ service innovation. The company coaches also provide feedback and evaluate the coursework of their student teams together with the course co-ordinator. The university co-ordinator and other teaching personnel involved commonly also take a coaching role when discussing students' approaches to tackle their projects and providing feedback on interim presentations of project progress. Additional (theoretical) course material is provided mainly to speed up the process of students to apply instruments such as feasibility and financial analysis and business model generation during their work on the set business development challenges. The business development projects executed by the student teams often gain in priority in the companies and students will take on internships or first jobs within the organisations.

Methods

In the course presented above, the practical new business development projects with the companies involved play a major role. Correspondingly, real-life experiences both in terms of presenting challenging business opportunities to students by the companies (e.g. entrepreneurs or managers) and the work of student teams on the projects and reporting this to peers and instructors are important methods in class. Teaching management instruments and theory relevant to the projects (e.g. business models) follows a flipped classroom format where students study input material (texts, illustration cases) at home while contact time in class is utilised for class discussion, reporting and feedback on the business development projects of student teams.

Action-based, practical approaches are a principal focus on teaching entrepreneurship at Erasmus University. For example, in a new venture planning course in the entrepreneurship master and in the RSM entrepreneurship minor for bachelor students ("Entrepreneurship and New Business Venturing") exercises around developing, evaluating, and exploiting business ideas or entrepreneurial opportunities by students are centre-stage. In the entrepreneurship minor, in particular an effectuation perspective operating on a (realistic) small resource base is employed so that students "will personally experience what it takes to become an entrepreneur

by dreaming up their own business idea in a team of students and will develop this idea into a real business under the supervision of expert entrepreneurs”.³²³

Using results of entrepreneurship research

Erasmus University’s track record in both the management *and* the economics perspective of entrepreneurship is surely specific. This also holds for the educational activities by RSM and ESE respectively having established full master degree courses in both domains which have been recognised for their strong underpinning in entrepreneurship research (see <http://www.erim.eur.nl/centres/entrepreneurship/news/detail/3469-erasmus-university-rotterdam-ranked-first-in-research-on-entrepreneurship/>). The two faculties use and leverage their expertise in entrepreneurship research also in education, offering degree programmes for careers in both general (entrepreneurial and innovation) management and entrepreneurship and SME policy positions.³²⁴ In practice, research output and teaching entrepreneurship are linked, for example in qualitative research studies on the innovation and entrepreneurial activity of SMEs conducted by RSM where authorised company cases are in turn used in class discussion or offer scope for management projects by student teams in experiential courses like New Business Development.

17.2.4. Setting of entrepreneurship teaching

Locations

Commonly, curricular entrepreneurship teaching takes place at the Erasmus University campuses. However, in courses like New Business Development where students work with external companies often learning will take place also at the premises of the external business stakeholders involved. Some of the curricular education also takes place at the Erasmus Centre for Entrepreneurship in the context of ECE’s entrepreneurship activities in the Rotterdam Science Tower (see 17.3.4 below).

Formal evaluation of learning outcomes

Formal assessment in the focal New Business Development course is a straightforward mix of deliverables contributing to students’ overall grading. Following an experiential learning format, the final assessment is based mainly on students’ written business development plans from their company projects, an interim report, and a final presentation of project results (with additional team assignments on a pass/fail basis). Some of the evaluation concerning the presentation and reporting on the business development projects with the companies is conducted by the external entrepreneurs and business managers themselves.

17.2.5. Instructors: teachers and mentors

Professors, other employees and external lecturers of the university

There is a strong human resource base of academic research and teaching personnel in entrepreneurship at RSM and ESE. In fact “[t]he Erasmus School of Economics was the first faculty in the Netherlands to establish a chair in entrepreneurship”, and today there exist three professorships in entrepreneurship and more than 30 researchers are involved in the field (ECE, 2013, 6). Academic staff comprises research, teaching, and dual positions which are either directly associated with the entrepreneurship units of RSM and ESE or work in adjacent fields like technology management or economics of innovation. For an overview of entrepreneurship personnel in RSM’s Department of Strategic Management and Entrepreneurship and ESE’s Department of Applied Economics (which is also home to the entrepreneurial economics staff of the faculty) see <http://www.rsm.nl/research/departments/strategic-management-entrepreneurship/faculty/> and http://www.eur.nl/ese/english/departments/department_of_applied_economics/staff/faculty/.

³²³ See <http://www.eur.nl/minor/minoren/faculteit/rsm/entrepreneurship>.

³²⁴ See http://www.eur.nl/ese/prospective/master/master_programmes/msc_in_economics_and_business/entrepreneurship_and_strategy_economics/career/.

Beyond the two business and economics faculties, there are also people from other faculties involved in teaching entrepreneurship sessions.

"Real entrepreneurs" as teachers

Expert entrepreneurs and intrapreneurs from SMEs and innovating larger companies are involved in teaching entrepreneurship as an integral part of curricular courses such as New Business Development or the entrepreneurship minor, as well as of extra-curricular programmes such as Get Started (see 17.3.3 and 17.3.5 below). In the focal New Business Development course, entrepreneurs take on a coaching role providing input, guidance, and feedback to the student teams working on the project challenges related to their businesses as well as to the other teams in class (e.g. in the final presentation of end results of all project challenges). When involving entrepreneurs in its entrepreneurship teaching programmes, the university taps its substantial network and community of entrepreneurs and SME owner-managers who are involved in regular ECE activities.³²⁵

17.3. Extra-curricular activities related to entrepreneurship education

17.3.1. Overview about extra-curricular entrepreneurship activities

Erasmus University Rotterdam offers a range of extra-curricular EE formats; some of them pioneered by the university and expanded internationally like the famous "Get in the Ring" investment battle format for entrepreneurs. Educational activities are offered in addition to regular undergraduate and postgraduate curricula.

Exhibit 4: Overview about extra-curricular EE activities at the Erasmus University Rotterdam

No.	Name	Objectives	Target group
1	Get Started	Providing kick-start support for start-up projects of nascent entrepreneurs from the Erasmus campus and outside; participants learn to evaluate their business ideas and turn them into scalable ventures	Student and graduate entrepreneurs; business founders
2	StEEP	"Mission of StEEP is to have its participants graduate...due to their and not despite of their study"; support programme for active entrepreneurs among the community of Erasmus students	Erasmus University students
3	Training Reeks	Training programmes to really make a change in participants' entrepreneurial leadership and management skills through training courses in small groups, guided by business trainers and coaches	Entrepreneurs; small business owners, corporate entrepreneurs in larger companies
4	New Business Cycle	Supporting and guiding innovation projects in SMEs and new businesses; programme moves from initial ideas to arrive at implementing innovations in the organisations of participants	Entrepreneurs, small business owners
5	Master Classes	One-day classes or lecture-type sessions to promote a specific topic and provide entrepreneurial management tools for a certain target group, e.g. an entrepreneurship class for employees of companies	Different target groups: companies and their employees, individual business managers and owners
6	Boot Camps	Compact workshops to familiarise participants with a certain area of entrepreneurial management, or specific tools such as business modelling or strategic entrepreneurship	Entrepreneurs; small business owners, corporate entrepreneurs in larger companies
7	Day@theCampus	Jour fixe networking event for the Erasmus community of entrepreneurs	Erasmus entrepreneurship community; people interested in entrepreneurship inside and outside the university

³²⁵ Mentoring activities by experienced entrepreneurs and managing support with regard to student start-ups is explicitly organised in extra-curricular formats at ECE and is thus discussed in 17.3 below.

8	Get in the Ring	Start-up/ business idea battle in a boxing ring competition format; run word-wide and pioneered by Erasmus University Rotterdam	All participants with a start-up idea who intend to compete in an international entrepreneurial idea challenge
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Extra-curricular activities are hosted and organised by the ECE in co-operation with the faculties of the university, in particular RSM and ESE. In fact, extra-curricular offers are conceptualised and validated by academics from the business and economics faculties of Erasmus University with regard to their content and achievement of learning objectives (for example intensive *training reeks (series)* for entrepreneurs and small-business managers or the *Get Started* programme for start-up entrepreneurs; see 17.3.3). Typically, the training sessions, lectures, and workshops in these programmes are co-ordinated and run together with faculty staff and entrepreneurs from the ECE community. One important aim in designing and establishing these extra-curricular programmes is their scalability, offering some of them countrywide in the Netherlands and, partly, also in the international arena.

In their mission to empower entrepreneurs and putting people centre-stage in education, the university and ECE offer extra-curricular activities for different target groups alongside the entrepreneurial life cycle (ranging from student start-up founders via growth-oriented SME entrepreneurs to intrapreneurs in large companies; see 0 below, <http://ece.nl/programmes/>, and ECE 2013 for the portfolio of extra-curricular EE offers).

17.3.2. Target groups of extra-curricular activities

In the past, the university's extra-curricular entrepreneurship education efforts focused on its own campus with potential students, former graduates, and staff interested in starting their own business constituting the main target group. Today, the university's entrepreneurship centre increasingly also focuses on business owners, SME managers, and corporate managers, triggering these target groups also to follow continuous academic education (e.g. in personal training programmes or workshop formats). Within the ECE there is the belief that concentrating education offers mainly on corporate entrepreneurship contexts adding to traditional start-up education will make the most significant impact on fostering entrepreneurship in the region around Erasmus University Rotterdam. This will also pave the way for the centre's further financial sustainability by offering paid education. The people participating in the education programmes from the domain of established companies are typically managers and management teams working in new business development, product development, or business innovation in their corporate roles.

With ECE's community approach attracting people from this target group to become a network member, some of these experienced entrepreneurs and managers later also contribute to entrepreneurship education for students (e.g. in providing study projects in new business venturing and development or acting as coaches to campus start-ups and as instructors in team-teaching curricular entrepreneurship courses; see the section on using the results of extra-curricular activities in entrepreneurship education in 17.3.3 below).

17.3.3. Designing extra-curricular activities

Intentions

Overall, ECE's activities aim at covering (further) entrepreneurship education needs along the entrepreneurial life cycle from student start-ups, growing small businesses, to corporate entrepreneurship in established large companies. This involves changing personal education needs ranging from managing initial start-up challenges, functional management issues in small business finance and marketing, to training needs for personal leadership in growing larger organisations. These education contexts are addressed through extra-curricular education services offered by the ECE and a selected example offer is described in detail in the next section.

Some of the activities are organised in a concise form (such as one-day boot camps, e.g. on strategic entrepreneurship or business development; <http://ece.nl/program-type/bootcamp/>)

with the idea to provide background knowledge and practical management tools (e.g. the business model and value proposition canvases). Other activities are set up as intensive training programmes to further develop specific personal skills for a small group of people over a period of several weeks or months with intensive personal feedback from trainers or academic instructors and group peers. Examples of this are the training weeks, e.g. on entrepreneurial leadership (<http://ece.nl/program-type/trainingweeks/>), or the Get Started programme, which is discussed below.

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As noted in 17.3.1 above, the university offers numerous extra-curricular entrepreneurship education activities through its ECE for different target groups and in different time formats. And ECE has chosen to enlarge the scope of entrepreneurship education also to embrace corporate entrepreneurship in its education portfolio, while education and support of start-up entrepreneurs also still plays an important role. All programmes are hosted and run by ECE. One of ECE's extra-curricular activities will be presented in detail in this case – the *Get Started* programme for nascent entrepreneurs. A further programme, StEEP, will be discussed in section 17.3.6 on managing student support for entrepreneurship.

As described on its website (<http://ece.nl/programme/getstarted/>) “ECE Get Started is an intense, ongoing ten-week programme created specifically to empower ambitious first-time start-up entrepreneurs”.³²⁶ Potential entrepreneurs can be either from the university campus (e.g. students or alumni) or come from outside. The practical goal of Get Started is to “give them [the participants] sort of a kick start in ten weeks to develop their business models, sometimes even get to first sales”, as one interviewee put it. Overall, the programme provides know-how in starting-up, networking opportunities with other start-up and experienced established entrepreneurs, and office infrastructure to be used at ECE's premises in the Rotterdam Science tower (ECE, 2013). The programme is facilitated by support staff from the ECE team and led and coordinated by an academic ECE team member also associated with RSM. Most importantly, coaching of participants in the programme is done by experienced entrepreneurs from the ECE community. Get Started also has two central company sponsors from banking and accounting who also offer specific coaching on financial, legal, and accounting issues. One example of a successful participant in the Get Started programme is the company Nestpick, which was acquired by Rocket Internet in 2014.

The structure of the programme within the ten weeks entails the initial intake of participants, five sessions at ECE, and a concluding pitch battle (ECE, 2014). Selection of students for the programme at *intake* is done by ECE on the basis of flexible criteria, most importantly the potential participants' ambition and the scalability and viability of their business idea. ECE will put together groups of four to five participants and select coaches for the groups who will be present during the sessions. Before kicking-off with the *first session* the participants in Get Started will be prepared by the programme co-ordinator. Up-front preparation at home will involve going through material and trigger questions around the business model and value propositions as well as financial and marketing issues of their start-up idea. The further *four sessions* at the heart of the programme have a three-hour intensive coaching format (both in the group and one-to-one). Session activities unfold around entrepreneurial challenges in the start-up process as participants report on what they have done to develop/ refine their business model and get their business established. The group and the coach contribute to resolving challenging issues and discuss what should be the next steps in a repeated progression for the next sessions. In the sessions, different management tools are introduced with focus on the practical insights and applications that entrepreneurs can take away from these instruments; theoretical concepts are only employed to facilitate conversation during the sessions, for example principles from lean start-up management and effectuation (for class preparation at home, short one-pagers of tools and concepts with additional reference material like videos, blog links or papers are provided). The programme concludes with a *pitch* where participants present their start-up business to successful entrepreneurs and investors in a large ECE pitching event and receive feedback, as well as further networking contacts.

The university has run the Get Started programme a number of times and the programme has recently been redesigned and developed further. This change has been triggered by increasing

³²⁶ Note that there is also a companion programme for established entrepreneurs aiming to grow and further develop their existing businesses called Get Business.

interest in the programme with growing numbers of participants and the possibility to run Get Started all around the year on ECE's new premises. Overall, change came about with the idea to make the programme more accessible and improve its contents for participants as well as with the aim to make its operation more efficient and self-sustainable for ECE in the future. Often, individual start-up coaching and support for university members (and externals) is organised on a one-to-one basis which was assumed to be very time consuming and inefficient by interviewed members of Erasmus University. Get Started enables offering start-up coaching with the additional bonus of peer interaction and support by fellow entrepreneurs in the format of group coaching. This more efficient and less personnel-intensive format will allow ECE to run the programme on an almost self-sustainable basis³²⁷ with real entrepreneurs from the ECE network and community acting as coaches (instead of university staff). In the past, Get Started has been offered at two starting dates per year. Recently, the structure has been changed. The programme is now running all around the year with continuous intake open for university members and externals to participate. This results in mixed groups traveling through the sessions with heterogeneous levels of experience enabling further peer coaching by those who are already closer to the end of the programme.

Methods and Media

Get Started and other ECE programme use a flipped-classroom approach. This is with the aim that participants prepare at home for on-site sessions with their programme group and coaches/trainers so that in the sessions at ECE a maximum of time can be allotted to interactive discussion and coaching with the peer entrepreneurs in the group and the entrepreneurial coaches. Provision of study-at-home material, coaching and group interaction is expanded further through using an online learning environment (myECE) speeding up students start-up process during the programme.

Using results of extra-curricular activities of entrepreneurship education

Frequently, start-up founders, small business entrepreneurs and corporate intrapreneurs who follow an extra-curricular programme at ECE and become part of the ECE community later get involved in entrepreneurship teaching. This may be, e.g., by providing start-up or business development projects for class discussion and acting as instructors in curricular courses (in the entrepreneurship master and bachelor minors) or serving as consultants and mentors in programmes to support young start-up entrepreneurs.

17.3.4. Setting of extra-curricular activities

Locations

A specificity of entrepreneurship at Erasmus University is surely the location and infrastructure of the ECE domiciled in the Rotterdam Science Tower. This includes the centre's own floor with teaching, meeting, networking spaces, and flexible offices as well as additional floors hosting the university's Start-up Campus offering a home base for start-ups from the university (ECE, 2013). ECE's facilities for accommodating education programmes, network events, and individual start-up teams are developed and managed by members of the ECE management team.

Timing

Principally, time formats of the different programmes are designed according to the education goals of each specific activity and the requirements of the target audiences. For example, the training weeks have a regular schedule for participants to apply what they have learned between weekly two-hour sessions which take place in the morning hours before the entrepreneurs start the business day in their own companies. Where busy entrepreneurs are themselves integrated

³²⁷ Note that self-sustainability is not achieved yet (with current programme fees of 250 Euro for students and 500 Euro for others). However, it could be in the future when the programme is to be run independently by the pool of entrepreneurs from the ECE community without much input by ECE itself beyond academic quality assurance. Currently, Get Started may be considered as an important "feeder for the community", as one interviewee coined it, providing new entrepreneurs to become members of the ECE network.

as coaches, e.g. in the Get Started programme, coaching sessions are concentrated in a three-hour format every fortnight.

Most importantly, ECE aims to build bridges between the offers by meeting at ECE for different activities on the same day to enhance networking and community spirit. For example, sessions of some programmes or one-day events are organised around the regular Day@theCampus event taking place every first Tuesday each month, and a specific day is regularly set for coaching activities and “get-togethers”.

17.3.5. Persons involved in extra-curricular activities

In the above portfolio of extra-curricular entrepreneurship education activities different types of people are involved, both from inside and outside the university. Externally, entrepreneurs from the ECE community and expert trainers certified by ECE serve in coaching and training programmes. ECE takes these people on board to maintain flexibility and integrate expert knowledge from outside – “we do not need to do everything...rather, we, at ECE, put these things together accordingly” as one interviewee framed it. Internally, there are three pillars of personnel with different roles:

- Academic staff from university faculties and ECE who develop and design the structure and contents of programmes and who coordinate and teach in some of the activities such as in the training weeks.
- ECE Students (the student association of ECE; <http://ecestudents.com/>) who are involved in organising and operating activities to raise awareness for entrepreneurship amongst Erasmus University students and build a platform for social activities around entrepreneurship on campus.
- Members of the ECE management and operations team (<http://ece.nl/about/the-team/>) who manage and co-ordinate education affairs of the centre and who work at ECE facilitating and supporting individual education activities and the centre’s community and network of entrepreneurs.

17.3.6. Management of extra-curricular activities

Managing student support

ECE supports potential and active student entrepreneurs from the university in the segment of its extra-curricular activities. Beyond providing a home for student start-ups on the ECE Startup Campus within the Rotterdam Science Tower and through the above Get Started programme and other training or networking activities, there is also a specific support programme for ambitious campus entrepreneurs called StEEP (<http://ecestudents.com/index.php/steep/about>). StEEP is the Students Entrepreneurs Excellence Programme initiated by ECE in 2012. Similar to support programmes for students who are competitive athletes, the idea of StEEP is to assist high-potential student entrepreneurs from Erasmus University in combining their studies with establishing and running their businesses. Students are selected for the excellence programme by experienced entrepreneurs and academics from the university. In StEEP, participants have a personal study advisor to address aligning study duties and business obligations such as meeting investors or customers. While StEEP students, of course, will have to finish their study assignments and course work like all other students, the programme allows to organise their studies more flexibly according to their business needs, e.g. in terms of time schedules and class participation. ECE runs the StEEP programme in cooperation with the university (and RSM in particular) and integrates participants in its growth programmes like Get Started, as well as in its overall entrepreneurial community.

Management of possible integration of extra-curricular elements and networks

As noted in section 17.3.4 on the setting of extra-curricular entrepreneurship education, ECE pursues the strategy to further develop a network and community of external entrepreneurs (including those interested in entrepreneurship from different angles like start-up consulting or enterprise policy) and entrepreneurship people from inside the university by bridging across education events held at one location – the ECE campus. In particular, this involves entrepreneurs who may take on both a participant role in the activities as well as become active

as coaches and management peers, effectively taking a (co-)instructor role in team-teaching with faculty personnel (e.g. in running a coaching session in the Get Started programme). The overall idea of ECE is to form a vibrant entrepreneurial community that is active all year long which is why, for example, the Get Started programme has been redesigned to now allow a continuous intake of new participants instead of running the programme only twice a year. Also, regular social networking activities and large individual events like the annual entrepreneurship research congress provide platforms for deepening integration and exchange.

Management of continuous education

ECE's offers in continuous education are managed independently in the centre by a member of ECE's management team responsible for education affairs. These activities include the college and training weeks as well as the master classes and boot camp activities held on a regular basis within the ECE community.

17.4. Institutional aspects of entrepreneurship education

17.4.1. Organisational set-up and change

The Erasmus Centre for Entrepreneurship (www.ece.nl) is at the heart of the university's further evolution towards anchoring entrepreneurship education in its organisation. The centre is organised as a company which is fully-owned by the university. In line with the humanistic, non-technical, tradition of Erasmus University Rotterdam, the mission of the centre to "empower entrepreneurs"³²⁸ (ECE, 2013) reflects ECE's goal to build a global entrepreneurial community (with 20.000 entrepreneurs by 2020) and valorise the knowledge of the university through education, in particular, training and consultancy work, to this community. This focus of the centre corresponds to the target groups of education offers in 17.2.2 and 0, making SME owners and managers of established larger corporations more entrepreneurial. Corporate entrepreneurship (in addition to catering for start-ups) is also an important element in achieving the financial sustainability of the centre (see the section on managing resource acquisition below).

Measures for coordinating and integrating entrepreneurship education across the university

Institutionally, the ECE has been founded and officially opened in 2013 as an entrepreneurship hub for the whole university and the region (see the timeline at <http://ece.nl/about/timeline/>). Historically, the centre has evolved from earlier institutionalisation activities related to entrepreneurship in the first decade after the millennium change. Namely, this has been through the HOPE programme initiated and funded by the Dutch government to build entrepreneurship centres and collaboration networks (see 17.1.1 above and HOPE Entrepreneurship, 2011). While the other two universities in the HOPE programme had specialised centres in supporting technology (Delft) and medical (Leiden) start-up entrepreneurship, Rotterdam, at that time, had many different activities and people involved in entrepreneurship within its faculties and on the Erasmus campus.

This de-centralised structure of entrepreneurship activities scattered across the university organisation in the HOPE programme impeded co-ordination and has been changed significantly with the emergence of the ECE as a new platform. While the initial structure at the time of the HOPE programme may be called "radiant", today the university with its ECE has a centralised "magnet" approach co-ordinating and branding entrepreneurship education activities to external stakeholders and the community of entrepreneurs under one roof and name. Internally, ECE has the central task of aligning the interests as well as the offered curricular and extra-curricular activities across the different university partners and customer groups involved, in particular (see 17.2 and 17.3):

- The RSM and RSE faculties with their curricular entrepreneurship education and research programmes.
- The ECE Students' board representing students interested in entrepreneurship, and, externally.

³²⁸ Rather than pursuing a mission dedicated to businesses and corporations.

- The business community of start-up and corporate entrepreneurs participating in entrepreneurship training offered by ECE.

This collaboration between academic staff from the two faculties³²⁹, the community of entrepreneurs, and the initiative of ECE Students to spread entrepreneurship across the Erasmus campus is “what ECE essentially consists of”, as one interviewee put it. Strategically, the central unit of co-ordination is the Board of Directors with ECE’s Managing Director and three academic directors from faculty together with a supervisory board including the two deans of ESE and RSM, as well as its Dean of Education (ECE 2013, <http://ece.nl/about/the-team/>).³³⁰ This structure ensures that the academic education and research needs of the university faculties involved in ECE are appreciated with the centre focusing on offering extra-curricular EE activities. These ECE activities regularly also involve faculty staff (e.g. in the training weeks) allowing the faculties to market their education formats jointly with ECE.

Operationally, ECE’s management team and operative team (see 17.3.5 above) co-contributes to integrating the EE activities bringing the faculties and the centre together (e.g. hosting the introduction of the entrepreneurship master programme on the ECE Campus together with the association of master students or co-ordinating the demands of entrepreneurial business and academic study in the StEEP programme). Reportedly, entrepreneurship centres in the Netherlands are either organised as a university hub focusing on education and research or as a commercial centre (e.g. organised as an incubator for technology entrepreneurship), whereas ECE considers itself as a unit that is home to both university-led entrepreneurship education and research and a business-led community of entrepreneurs participating in and contributing to extra-curricular entrepreneurship training.

Managing the acquisition of resources

Similar to other government-funded initiatives to establish entrepreneurship at European higher education institutions, also the HOPE programme provided resources only for a certain period of time. Today, one of the prime objectives of the ECE management team is to organise the entrepreneurship centre so that financial sustainability can be achieved by internal financing from its own operations and without money from the public part of the university. The initial establishment of the ECE in 2013 and 2014 has been supported by external knock-on financing, in particular from the EU. This has been with the idea to fund “growth activities” (as one interviewee put it) in entrepreneurship education which will “stand on their own feet” in the future.

In a first step, financial sustainability has already been reached for the centre’s facility operations (renting offices to start-ups and young businesses and hosting events on the ECE Campus in the Rotterdam Science Tower). In a second step, ECE’s management aims at making the centre’s core education activities self-sustainable. The key element on this path is to offer training and consulting services along the complete entrepreneurial life cycle, i.e. also in the field of corporate entrepreneurship to SMEs and large enterprises (like the training and college weeks) in addition to start-up support (e.g. the Get Started programme). Overall, the management of ECE envisages that a broad portfolio of paid education in corporate entrepreneurship and start-up entrepreneurship offered to ECE’s community of entrepreneurs will lead to a more stable entrepreneurship centre as compared to pure start-up centres. In fact, the community of SME owners, entrepreneurs, and business and innovation managers will play an important role in achieving self-sustainability by engaging community members as coaches and mentors³³¹ in education activities of ECE with the centre mainly providing the platform and bringing people together (e.g. student start-ups and experienced entrepreneurs).

17.4.2. Mindsets and attitudes

Raising awareness for the importance of entrepreneurship

³²⁹ RSM and ESE are the two largest schools respectively faculties of Erasmus University Rotterdam. While the two business and economics faculties with their entrepreneurship teaching and research staff have been instrumental in establishing the entrepreneurship centre in the first place, ECE intends to integrate more faculties of the university in the future.

³³⁰ In addition, there is also an advisory board with members from business entrepreneurship and government.

³³¹ On a pro-bono basis or compensation below market rates.

From the point of view of the centre's management team, the ECE Student Association is most important in raising awareness for entrepreneurship as an activity (e.g. to solve societal problems through social entrepreneurship) and career option. The ECE Students' board organises different activities (<http://www.ecestudents.com/index.php/events>; <http://www.ecestudents.com/index.php/programs>). Some of these events and programmes are low-barrier activities to get students of the university interested in entrepreneurship in the first place while others encourage funding one's own venture and support in business planning, for example:

- A 24 hour business game where participants bring their entrepreneurial idea and develop a business model and plan in student teams supported by business consultants and the university's IT department (e.g. to prepare websites)
- SEM – a social entrepreneurship master class where students develop solutions for pressing social problems together with coaches and guest-lecturers
- European and global study trips to learn about the local start-up scenes of other places (e.g. to Berlin in 2015)
- Formats like Brain Busters, Clean Tech Challenges, and Idea Labs where students work on innovation projects, often in co-operation with other universities.

Encouraging entrepreneurial behaviour

Overall, ECE Students is visible across the Erasmus University campuses providing a platform for social events and extra-curricular activities related to the entrepreneurship theme. And for the entrepreneurship centre, reportedly its focus on people (rather than on businesses and ventures as corporate organisations) make it easier to offer entrepreneurship formats at the university as an education institution. Erasmus students who come out of these extra-curricular activities with a definite motivation to set-up their own business can then join the Get Started programme to further map out and implement their business idea (17.3.3). Disseminating initial curricular activities integrated in different bachelor degree programmes in the different faculties of the university, e.g. offering entrepreneurship minors to non-business/economics students is intended but entails the challenge of getting teaching personnel from these faculties on board.

17.5. Impact and lessons learned

17.5.1. Evaluating impacts of the entrepreneurship education approach

Overview of impact evaluation methods applied

Beyond the institutionalised accreditation of degree programmes (e.g. of the RSM entrepreneurship master by AACSB, AMBA, and EQUIS) and university-wide evaluation of course modules, the university and the ECE employ two more entrepreneurship-specific evaluation instruments: the GUESSS – Global University Entrepreneurial Spirit Students' Survey and an own longitudinal entrepreneurship survey of Erasmus University students.

GUESSS

The Erasmus University Rotterdam and the ECE are the country leaders of the Dutch GUESSS poll conducted at 28 higher education institutions in the Netherlands in 2013/2014 by a team around Roy Thurik from RSE (<http://www.erim.eur.nl/centres/entrepreneurship/news/detail/3552-dutch-guesss-team-wins-award-for-excellent-data-collection/>; GUESSS 2013/ 2014; ECE 2014a). ECE reports that "[t]hrough GUESSS we assess the effectiveness of the university's entrepreneurship programmes by systematically recording and tracking students' entrepreneurial spirit, intentions and activities on a global scale" (www.ece.nl/research).

Longitudinal Entrepreneurship Survey of Erasmus Students

While GUESSS as an international evaluation instrument enables benchmarking the entrepreneurship education activities at Erasmus University Rotterdam to those of other education institutions, the university and ECE have established an additional longitudinal survey instrument so as to gain even deeper insights with regard to the organisation's own students and graduates. This self-developed survey has been administered twice so far and allows to

tailor the analysis of Erasmus students more specifically to the curricular and extra-curricular education and support offers of the university's faculties and the ECE (e.g. in terms of how entrepreneurship is perceived at the university, and students' awareness and impressions of specific courses and activities).

17.5.2. Lessons learned

Summary of lessons learned from this case

Erasmus University Rotterdam is well established in both entrepreneurship education and research. The university and the Erasmus Centre for Entrepreneurship (ECE) offer complete entrepreneurship degree programmes and a differentiated portfolio of extra-curricular entrepreneurship training, coaching, and support across the whole spectrum of start-ups, SMEs and established corporations. What can be learned in particular from Erasmus University relates to two interlinked domains:

- Further developing an established entrepreneurship teaching profile;
- Managing the sustainability and operational efficiency of an entrepreneurship centre together with a network of entrepreneurs participating in and contributing to entrepreneurship education in the entrepreneurship centre.

Given the first point, Erasmus University has been running bachelor modules and complete postgraduate entrepreneurship programmes and corresponding research activities for many years. The particular strength is clearly to teach and research entrepreneurship from both the management and economics angle with established master degrees and renowned research tracks in entrepreneurial management and business innovation as well as in the economics of entrepreneurship. The challenge to make these offers future-proof has been tackled by the university, advancing the former "Entrepreneurship and New Business Venturing" master offered by the Rotterdam School of Management. The management school has recently set up a novel "Strategic Entrepreneurship" programme with corporate entrepreneurship taking a more prominent role adjacent to start-up management (which is also still part of the programme). Actively **leading change in one's educational profile provides opportunities for tapping new or expanding target groups**, in this case established entrepreneurs, SME owners, and corporate intrapreneurial managers in addition to traditional nascent entrepreneurs and start-up founders. Taking these new target groups on board allows maintaining a master programme focused on entrepreneurship over time within a competitive portfolio of postgraduate education.

While particularly insightful in the context of business schools with funding based on tuition fees, expanding entrepreneurship teaching portfolios towards SMEs and corporate entrepreneurship in established firms may also be an interesting strategy generally. This may be especially in times of declining government funding for regular higher education and corresponding needs to market degree programmes with economically viable tuition fees across different target groups. And students seeking first-time start-up education and training can still be catered for, e.g. through a master programme blending corporate entrepreneurship and new business venturing education as well as start-up support in cooperation with an entrepreneurship centre as is the case at Rotterdam. The broadened mix of target groups also benefits the entrepreneurial community around the ECE overall, with experienced entrepreneurs and business managers supporting and coaching junior start-up entrepreneurs (e.g. from the university).

Considering the second point, the establishment and operation of the ECE is instructive in many ways, in particular regarding its positioning within the university, its path towards financial independence, and the management team's approach towards running the centre. As discussed in 17.4, the centre's fundament entails the education and research input from the university's schools of management and economics, the engagement of ECE students in entrepreneurship activities, and the community of business people and entrepreneurs as members of the centre. The centre benefits from Erasmus University's strong market recognition in management and economics education. At the same time, the centre provides a platform for university faculties to market their research knowledge and education expertise through ECE's training, workshop, and programme formats (e.g. entrepreneurship boot camps, training weeks, or master classes) under the roof of one university-wide entrepreneurship brand.

The centre has been started on the basis of public funding in the beginning. Yet today the centre is run so that it becomes more and more self-sustainable over time by generating cash

flows through its education products, services, and facilities (see 17.4.1) offered to its expanded corporate target groups in addition to supporting start-up entrepreneurship. Moreover, teaching and coaching formats have a scalable and flexible structure within the centre. For example, in its Get Started programme (see 17.3.3) ECE offers start-up coaching and support for individual start-up entrepreneurs (students, alumni, university staff) similar to other entrepreneurship centres. However, the Get Started programme has a staged structure and coaching format allowing entrepreneurs to take part in the programme individually all around the year and learn from each other as a group and from experienced entrepreneurs serving as coaches. This structure allows ECE to scale start-up support and run the programme with decreasing dependence on the centre's own personnel resources.

Generally, also the other extra-curricular entrepreneurship training and teaching formats of ECE are designed to be highly instructive by involving entrepreneurs and entrepreneurial managers (together with university experts) to coach and train other entrepreneurs and business managers. Both the **scalable structure of extra-curricular activities** and **the integration of the community of entrepreneurs contribute to operate the centre in a resource-efficient way** and integrate real entrepreneurs or other entrepreneurship practitioners (e.g. start-up consultants and corporate intrapreneurs) in education; both scalability and integration are important for running entrepreneurship centres in higher education in general.

Transferability to other universities

First of all, for other higher education institutions aiming to build complete postgraduate education programmes in entrepreneurship the case of Erasmus University's degrees in *Strategic Entrepreneurship* (at the Rotterdam School of Management), *Entrepreneurship and Strategy Economics* (at the Erasmus School of Economics), and *Cultural Economics and Entrepreneurship* (at the Erasmus School of History, Culture and Communication) will be inspiring as regards their structure and focus. This is in particular in view of the above lesson learned for positioning a programme (the new Strategic Entrepreneurship master) for the future with corresponding target groups and teaching contents. Since comprehensive education offers in the economics of entrepreneurship are rare (adjacent to widespread entrepreneurial management formats in higher education across Europe), Erasmus University is an interesting benchmark and blueprint for those universities with strong economics faculty teams. Clearly, the university and Erasmus School of Economics in particular have built a strong base of faculty staff in entrepreneurial economics (and management) over many years. Still, however, taking on board selected education and training activities or cooperating in the field with Erasmus University may well be a workable path for growing the economics strand of entrepreneurship in one's business and economics departments at home.

In addition to the entrepreneurship education efforts of the Schools of Management and Economics, also the Erasmus Centre of Entrepreneurship constitutes a very interesting blueprint. This is especially in the case of the ECE's humanistic mission to empower entrepreneurs and its management perspective to build an entrepreneurship centre to stand on its own feet based on its own education and training offers in collaboration with the same community of entrepreneurial people it envisions in the above mission. In this respect, ECE's approach to extensively integrate its member community of entrepreneurs in its teaching offers by engaging them as coaches and instructors is a meaningful way forward. This may be an option in particular for those entrepreneurship centres at European universities which would like to expand their entrepreneurship education and start-up coaching offers from a limited base of own university staff. Regarding specific education activities to achieve this integration of a community of entrepreneurs into entrepreneurship teaching, ECE has designed activities that can be scaled and coordinated efficiently such as the Get Started programme for nascent entrepreneurs or the New Business Cycle programme for SME Entrepreneurs. Both programmes involve experienced entrepreneurs in instructor roles and teach other entrepreneurs in the ECE community. For this it is essential to keep the wheels in motion within a vibrant network of entrepreneurial people at the heart of the centre. Towards this end, ECE has set-up events and network structures such as Day@theCampus and other specific meeting and training activities that are valuable to study and transfer to one's own education institution.

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18. University of Southern Denmark: IDEA centre for promoting entrepreneurship education across the university

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Abstract



The University of Southern Denmark (SDU) uses a centralised approach to spread and integrate entrepreneurship education (EE) across its six campuses and its five faculties. SDU's EE is primarily based on a comprehensive and broad understanding of entrepreneurship in the sense of innovation and value creation. The SDU-annexed IDEA Entrepreneurship Centre plays a major role in developing adequate curricular courses, offering additional extra-curricular courses for start-up oriented students and alumni, as well as training educators from non-business faculties in entrepreneurship education. SDU aims at making one EE course obligatory in all study lines. So far, SDU provides 61 EE courses across all areas. Still most of the courses, and hence participants, belong to the faculty of social sciences. Many students only have a vague idea of what entrepreneurship is and only refer to it as "something with business"; hence they tend not to pick an EE course. Therefore, making EE courses compulsory in Bachelors or Master programmes (e.g. Sports and Health), or both, has been a crucial element in increasing student numbers attending EE. In SDU's experience, an independent umbrella institution like IDEA organising all EE activities across the university helps to avoid the fear of "fighting over students".

Case study fact sheet

▪ Full name of the university and location:	University of Southern Denmark, Kolding
▪ Legal status	Public, Self-Governed institution funded by the government
▪ Location:	Campuses in Odense, Kolding, Sønderborg, Esbjerg, Slagelse, Kobenhavn
▪ Year of foundation:	1966
▪ Number of students:	29,000
▪ Number of employees:	Administrative: 2,100 Academic: 2,900 PhD: 900 (source: Strategy Statement, p. 19)
▪ Budget in most recent financial year:	Ca. 366,000,000 EUR (source: Årsrapport 2013)
▪ Academic profile:	Five faculties: Engineering, Humanities, Health Science, Business and Social Science, Science
▪ Entrepreneurial profile:	Kolding: Institute for Entrepreneurship and Relationship Management (IER, 85 employees): Center for Entrepreneurship and Small Business Studies, IDEA Entrepreneurship Centre (nine employees)
▪ Activities focused in this case study:	Role of IDEA Entrepreneurship Centre as EE facilitator and promoter of entrepreneurship education within SDU
▪ Case contact person(s):	Prof. Torben Bager, Managing Director IDEA (gatekeeper)

Information included in this case study is from end of year 2014 unless stated differently.

18.1. The university's entrepreneurial profile

18.1.1. The university's overall approach to entrepreneurship

The University of Southern Denmark (SDU) is a growing university with six campuses. Its long term goal is to become an "entrepreneurial university". It is important though, to point out that SDU does not equate entrepreneurship solely with start-up activity. Rather, it takes the broader "comprehensive perspective" of entrepreneurship, i.e. entrepreneurship as a means of value creation and a source of innovation. Being located in a region which is historically known for its strong small and medium-sized business sector, SDU has developed a core competence in high quality entrepreneurship research. To date, this research focus covers more than 70 researchers and educators at different levels of qualification who are conducting research studies concerning entrepreneurship and entrepreneurship education (EE). Examples of the extensive research studies are the frequent publication of the Danish Global Entrepreneurship Monitor and books on entrepreneurial education, competencies or mind set.

A major success factor for EE at SDU is a centralised cross-campus university entrepreneurship competence centre – the IDEA Entrepreneurship Center. It literally "is the mechanism for facilitating all EE programmes at SDU" (Torben Bager, Managing Director of IDEA and Professor at SDU, see. also Chapter 1.4). IDEA is an acronym for "International Danish Entrepreneurship Academy". It was set up in 2005 to promote and organise entrepreneurship teaching and training at Danish universities and university colleges. IDEA will be a central aspect in this case study due to its importance for SDU's strategy to transform itself into an entrepreneurial university.

Not only do SDU and IDEA foster entrepreneurial competencies among students and staff, they also aim to develop tools for measuring and evaluating the impact of EE. An international workshop on the latter theme was held in February 2014.

18.1.2. Leadership and governance

Importance of government strategies

SDU's entrepreneurship initiative can initially be regarded as a result of top-down pressure, which was put on all Danish universities by the Danish Ministry for Higher Education. The Ministry aimed to create long-term economic growth by increasing the number of students attending EE courses annually by 5%. This annual rate is now included **in SDU's "Development Contract 2012 – 2014"**³³². To date, SDU benefits from the Danish Ministry for Higher Education 2005 "initiative to promote and disseminate entrepreneurship education across Danish universities". Based on this initiative, the then so-called IDEA Consortium was founded and financed as a start-up by the Ministry. The aim was to develop new and innovative EE programmes. IDEA has since then been regarded as the facilitator for establishing broad and interdisciplinary offers of EE courses across all faculties. In 2010, SDU took over IDEA from the government, annexing it as an SDU competence centre for EE and training. The strategic goals of the former governmental initiative have been integrated into the university's overall "vision" and mission statement.

Along with the persistent top-down pressure, there was also a pull-effect, which helped in establishing EE programmes at SDU. Students, especially those in the field of technology, were searching for practical opportunities to complement taught theory, creating considerable demand for EE. SDU was able to benefit from this opportunity and consequently adapted new EE offers.

Importance of entrepreneurship in the university's strategy

Although entrepreneurship plays a major role in SDU's day-to-day education programme, it is not explicitly mentioned in its current strategy statement. The strategy statement is essentially an agenda outlining the goals that should be reached by the University until the year 2020. It also contains aspects that are somewhat related to EE. For example, "differentiated forms of learning" through the "use of active learning and activating teaching", which are both elements of EE, are mentioned in the strategy paper. The strategy paper considers these to be important

³³² See http://www.sdu.dk/om_sdu/organisationen/udviklingskontrakt.

factors in increasing the quality of SDU's degree programmes, which would consequently attract high-potential students to the University. The University also calls for the training of educators in all areas of study in order to enhance teaching competences. Entrepreneurship is directly represented in SDU's mission statement, especially with its relation to "interdisciplinary and innovative qualities" (Mission Statement SDU). There is also a commitment to entrepreneurship education in the Development Contract for 2012 – 2014 between the University and the Danish Ministry of Science, Innovation and Higher Education.

The University's strategic outlook concerning students explicitly regards entrepreneurship in terms of helping and supporting students to develop "an entrepreneurial profile" (see Annex 3, Screenshot "Inspirational Learning"). This means that there is a strong intent to take entrepreneurship out of a pure business focus and turn it into a viable tool for students of all faculties to find their own innovative ways of transforming theory into practical application (Torben Bager, Head of IDEA Entrepreneurship Centre).

Another strategic move is that IDEA's CEO is one of SDU's leading professors within EE research. This *double position is essential* for the well-functioning cooperation between IDEA and SDU, since it lowers the fear of competition among faculties. It was reported by the IDEA's Director that some professors were afraid of losing students to Business faculties after students have opted to take an EE course.

Extent of high level commitment to implementing entrepreneurship

In all areas of research and education, students are to be provided with "inspirational learning, a motivational environment and helpful services" so they can take an active part in "creating a dynamic and cohesive education system". SDU strategically puts the students in focus. The University's homepage stresses that students should be able to create opportunities to develop an entrepreneurial profile (Annex 3). However, this is unfortunately not a part of the current strategy paper. EE is not supported directly by the Dean, Director or Vice President. However, the mere existence of the IDEA Entrepreneurship Centre, which is co-financed by SDU, shows a commitment by the University to implement entrepreneurship education.

Level of faculties' and units' autonomy to act

The overall goal is to offer at least one EE course for each study track that a student chooses. At least one lecturer from every faculty has participated in EE training at IDEA. This faculty member serves as a "gatekeeper" for his faculty. The gatekeepers help with the implementation of EE courses in different disciplines in close coordination with IDEA. Entrepreneurship educators at SDU are also provided with flexible lecture hours. Educators from the Institute for Entrepreneurship and Relationship Management (IER), for example, have the opportunity to ask for more lecture hours if the need arises and if the budget allows. This flexibility is beneficial because it enables SDU to react appropriately to growing demand for EE by students. With regard to content and teaching methods used in EE, the faculties possess certain autonomy. This is due to SDU's comprehensive understanding of entrepreneurship. The courses are designed to be partly experimental and each discipline also focuses on experiential learning.

University's importance for driving entrepreneurship in its environment

Southern Denmark is traditionally characterised by a large number of small and medium-sized companies. Multi-national, industrial leaders belonging to technology and renewable energy industries, such as Danfoss, Grundfos, Linak and Vestas are also a part of the corporate make-up of Southern Denmark. SDU holds a key position when it comes to providing this region and its companies with highly qualified and entrepreneurial employees. Better qualified employees can forward the innovation potential of these companies, which would push growth in the region. As already mentioned, growth is one of the central goals of implementing EE at universities. In 2013, the Danfoss Global Business Center (DCGB) located at the SDU campus in Sønderborg, opened its doors to academics and business stakeholders. The aim was to enable an active knowledge exchange through joint research projects and teaching activities. One of the major goals was to promote complementary collaboration between academia and business.

18.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

SDU is working with, and also using, IDEA's EE programmes in addition to its own Bachelor and Master programmes. As a result of this many of SDU's EE educators come from IDEA. IDEA also connects external lecturers and trainers with other universities focusing on entrepreneurship and lifelong learning. The lecturers and trainers, for example, can either be start-up entrepreneurs or entrepreneurial employees, as well as professionals from the corporate sectors. IDEA does not only promote regional networks, but also international collaborations. It is important for SDU and IDEA that lecturers and teachers within their EE faculties have experience with entrepreneurship, business start-ups and experiential learning. Lecturers and teachers are also encouraged to develop an entrepreneurial attitude, both for themselves, as well as for promoting the same mind-set among participants. IDEA reaches out to these teachers and gatekeepers in different faculties, and validates them as potential EE teachers through mutual and extensive communication processes. Simply put, teachers who show an interest in EE can then participate in a workshop, which prepares them for integrating EE contents and methods into their taught discipline. They are hence trained to be entrepreneurship educators within their own academic fields. This is the tool that facilitates the implementation of EE courses in all study areas. IDEA currently has nine employees; four to five of them frequently teach EE or innovation courses and train other educators. Hence, there is a multiplication effect with regard to training other teachers for EE.

Financial resources for entrepreneurship education

Information on direct investment into the EE curriculum is not comprehensive. However, statistics available from IDEA support the development of curricular EE activities. According to Torben Bager, SDU invests about 1,000,000 Danish crowns (DDK) (approximately 134,000 euro) per year in its activities. On top of that IDEA needs another 5,000,000 DKK (approximately 666,000 euro) per year for keeping all its activities running. 80% of IDEA's funding is external. IDEA generates a major part of its funds through participation in projects backed by institutions such as Interreg, ESF or similar organisations.

18.2. Entrepreneurship in curricula and teaching

18.2.1. Overview about curricular offers in entrepreneurship education

In 2013, SDU offered 61 EE courses, compulsory and elective. 2,588 students attended these EE courses. Exhibit 1 provides an overview of major courses. Annex 1 shows a comprehensive overview of courses offered throughout the university.

Exhibit 5: Overview about major curricular EE offers at the University of Southern Denmark

No.	Name	Contents	Target group	Offered since	No. of participants in [2013]
1	Entrepreneurship & Design	Combine creative idea generation with business processes The course builds upon the idea that both designers and entrepreneurial persons try to shape their future through creating something new. The course aims at using the synergy between the highly creative potential of designers and the core business knowledge of business students. The focus is on transferring theoretical expertise into practical value creation.	1 st year BSc International Business Compulsory (Kolding)	n.a.	31
2	Entrepreneurship & Leadership	Understand central terms within entrepreneurship	1st year BA students in business students Compulsory (Kolding)	n.a.	38
3	Intra- and Entrepreneurship	Understand theoretical basics about the role of entre- / intrapreneurship	1 st year MSc strategic	n.a.	14

	Theory and Policy		entrepreneurship Compulsory (Kolding)		
4	Udvikling af forretningsidéer - Idea Generation	Creating business ideas and innovations	1st year MSc strategic entrepreneurship	n.a.	46
5	Innovation Strategy	Understand how a company strategically acts and how its innovation strategy is intertwined with its overall company strategy	1 st year BSc in Engineering Compulsory Odense	n.a.	12
6	Experts in Teams	Learn how to cooperate regarding idea development and analyse its potential to commercialise	BSc, 'Diplomingenør' compulsory (Odense)	n.a.	260

According to one of the lecturers, Suna Lowe Nielsen, the gender distribution among business students participating in EE courses is well balanced – approximately 50/50%. This equals the share of female students in business studies at large but is remarkably high compared to common female participation rates in EE. Gender gaps can be expected, though, in courses that relate to technological contents since these areas suffer from low women's participation in general.

Due to SDU's traditional and historical focus on small- and medium-sized enterprises, it offers a large number of EE courses within the field of Business Studies. Most of the participants in EE courses are business students. The next biggest group of students attending EE lectures comes from the Faculty of Engineering. Here, the innovation potential with regard to product development is high and entrepreneurship courses enrich the Engineering curriculum creating opportunities to commercialise technologically innovative ideas.

18.2.2. Target groups

Main target groups of entrepreneurship education

At SDU, EE starts with raising awareness for entrepreneurship. Creating an entrepreneurial mind-set is a long-term goal at SDU. Generally, EE programmes address **students from all faculties**. The faculties of Economics and Business Studies especially have a strong background in EE, which dates back to SDU's entrepreneurship history. Therefore, the largest selection of curricular EE courses is offered at these faculties, including both a Bachelor of Arts and a Master of Science programme in Entrepreneurship. However, all faculties and study tracks have at least one course dedicated to entrepreneurship. The idea is to give each student the opportunity to transfer his in-depth knowledge about his chosen specialisation into value creation.

Another concept is to make EE appeal to students from all study areas. The focus is not just on one study area, for example, business. Again, it is worthwhile to note that the aims of this perspective are twofold. First, that EE programmes are focused on students who are interested in start-up activity and this serves the narrower perspective of entrepreneurship. Second, EE should also foster the wider view on entrepreneurship, i.e. fostering creativity, ideation and conceptualisation with the goal of making students see "the big picture". This skill would enable them to apply their theoretical knowledge to actual problems.

The **main challenge is to move EE out of a pure business context** and make it a viable tool for all faculties, from Humanities to Engineering. The objective of this is to teach entrepreneurial and innovative thinking to students from all study tracks and to avoid the impression that EE programmes "steal" students from these faculties. This is something that SDU already experienced during the years leading up to the establishment of IDEA.

Some EE programmes (also curricular) try to **team up students from different study** areas (e.g. business and design) together to share their knowledge in the different areas and combine it in new ways to create new value.

Experience has shown that within business studies there is an almost **balanced gender ratio** and to date no extra course targeted at women in particular has been created (or needed).

Continuous education

SDU offers continuous EE especially for alumni and PhD students. Most of these offers are extra-curricular and attract students who have concrete business ideas. In addition, students juggling with their own business idea can participate in summer schools or receive extra consulting from IDEA Entrepreneurship Centre and its various experienced partners.

Bridges to secondary education

Currently the SDU does not have links with EE for secondary education.

Specificities

One method of reaching a large number of students to take at least one EE course is making it **obligatory across the whole campus and all faculties**. This way each student should have at least heard about entrepreneurship and ideally have a more concrete idea of what entrepreneurial activity is. In some courses there is a stronger focus on innovation especially when entrepreneurship is not directly related to starting a business but creating value within an existing organisation. This comprehensive focus is especially trained in the technical and health-care field where students typically have a deep factual expertise but no or few experience in transferring it into value creation.

18.2.3. Designing lectures and courses – basic curricular decisions

Intentions

As stated by Suna Løwe Nielsen, all EE courses have the same intention, that is, students should be capable of thinking “outside the box and building the linkage between theory and practice”. Entrepreneurship educators want their students to use specialised knowledge from their discipline **to identify and analyse problems** and to **find a solution** for these problems in order to **create new value**. EE aims to equip students with this set of competencies, which is referred to as entrepreneurship approaches of creating, exploring and exploiting opportunities.

Courses in **business studies** focus on the understanding of how a company functions, how value is generated, and how business processes depend on product offers or value proposition. In entrepreneurship courses, business students analyse the steps preceding the creation of a company as well as learning new ways to push innovation within an existing company. According to the responses garnered from focus group interviewees, especially students participating in the MSc programme in Entrepreneurship, course content in both Business Studies and Entrepreneurship is intertwined. This additionally helps in facilitating a better and holistic understanding of the relationship between entrepreneurship in a business context, innovation and the creativity process.

In more technology oriented subject areas, the challenge lies in the commercialisation of student inventions. There have been cases where students invented technical equipment but lacked the knowledge and experience for developing a market-ready product. Knowledge of entrepreneurship is expected to intervene in exactly such a case. EE is meant to make students create, evaluate and exploit (business) opportunities and think in terms of value creation. Students should have an idea of what steps to take and which resources to utilise when realising a business idea. One of the main goals of the more general EE courses is to promote an entrepreneurial mind-set. It was expressed by one student in a focus group discussion that, “Entrepreneurship is more like a way of thinking”. This statement is the idea of EE in a nutshell. It underlines the importance of creating an entrepreneurial mind-set as well as getting students to think in terms of problem solving.

Contents

EE courses at SDU follow a certain structure. First of all, the teachers seek to create a common understanding among all participating students, of what entrepreneurship is. IDEA and SDU try to focus on the more comprehensive entrepreneurship approach, i.e. not only starting a business but pushing innovation within existing organisations. After students have been familiarised with the basic concepts, teachers can start creativity training. This is done mostly through case work. The focus is on the importance of linking creative processes with factual knowledge. The aim is for students to identify, analyse and resolve “pains” of companies, customers or other stakeholders, by using their theoretical knowledge.³³³

Basic entrepreneurship principles are presented and discussed to create a common understanding of the concept of entrepreneurship. In this context, theories about entrepreneurship and entrepreneurs are introduced. To get the **creativity process** started, lecturers use “DesignThinking methods”, an iterative nine step model. Students work together in groups on **real cases**. These can either be (local) nascent entrepreneurs and their individual problems during the start-up phase; or problems defined by companies cooperating in the programme. This method helps in building the bridge between theoretical knowledge and practical application.

Design Entrepreneurship

In this first year Bachelors course, business students are working in the field of “applied entrepreneurship”. The course has both a social (students get to know each other) and an entrepreneurship aspect. The underlying concept is the idea of entrepreneurship being a core competency for innovation and creating value.

In this course (real) business is brought into the class room. Last year business students worked as consultants on real cases by three local designers who had problems establishing their businesses. They were participating in roughly 50% of all lectures. Two lecturers introduced the design thinking method as a tool for identifying a problem and elaborating a possible solution to this problem. According to Suna Nielsen, the design method was identified as a suitable method for enhancing creativity and interaction among students and entrepreneurs since it combines creativity techniques with business thinking. The identification of the actual problem is one of the most crucial elements. Hence the involvement of the real entrepreneurs in the lectures is a necessity. Throughout the whole process, the students are supported by the lecturers to ask the right questions. Once the problem(s) is identified the students are, as a part of the design thinking method, constantly invited to create solution prototypes and mark-ups and to visualise their ideas.

Methods

According to Suna Løwe Nielsen, entrepreneurship educators experiment with different methods throughout the duration of the EE course. Methods differ according to the context and the level of experience of the students within the field of entrepreneurship. Many courses are inspired by Kolb’s “experiential learning model” and the DesignUni model (Suna Løwe Nielsen). In Business Studies courses, entrepreneurship can be chosen as a BA or an MSc degree. In both these study tracks, a broad theoretical knowledge and the applicability of theory to practical situations is considered highly relevant. The fundamentals of entrepreneurship, such as concepts and definitions, are taught in a more conservation manner, for example, through simple lectures. However, slots for discussion are always allocated within the lectures. Students are introduced to creativity and design-thinking methods at a very early stage of their EE programme. One good example is the “Introductory Camp in Business Studies”. In the Introductory Camp, students work over a period of one week on *real life problems and case work*. By the end of the Camp, students are expected to; 1) identify, understand, and explain important concepts, theories, methods and processes within the areas of creativity, ideas and entrepreneurial opportunities; 2) connect and link the presented concepts, theories, methods and processes; 3) explain and analyze divergent idea generation processes and convergent idea developing processes and relate these principles to practical cases; 4) use, reflect upon and make new pragmatic connections of the required knowledge through developing a creativity or innovation camp in groups; and 5) undertake the role of creative process facilitators based on the acquired

³³³ For example, the business students’ introductory camp once dealt with a marketing problem of the local swimming pool and the city of Kolding as a better place for students. In both cases students had one week to elaborate viable business or marketing concepts to reach their task. Especially in curricular business courses actual start-up processes and related resources are being discussed.

knowledge. In interviews for this case study, both students and lecturers mentioned the relevance of *case work* as crucial elements in EE. For the students, it is important that these cases are *not fictional* but relate to *actual companies and real "pains"* these companies suffer from. Thus, case work requires participant involvement – internal (students) and external (organisations, entrepreneurs), as reported by Suna Løwe Nielsen.

During the EE courses where external partners are involved and students are working on real life cases, they work with visualisation through prototyping and mark-up production. The purpose is the constant interaction of real life and theory.

Media

The SDU does not use specific media in EE. Occasionally, videos can be used in training for and visualizing presentation skills. Video footage is occasionally presented in case work. There is also frequent use of computers in many activities.

Informal evaluation of learning outcomes and feedback for students

In addition to feedback presentations by educators, fellow students frequently provide mutual feedback in peer-review assessments. In these assessments, they evaluate each other depending on the time schedule of the course, which can vary from weekly (curricular) to more than once daily (workshop). External partners involved also give their feedback to the students – both regarding project contents and communication skills. Recently, students have been asked to use visual logbooks (see 1.2.4.), where they try to visualise their personal progress within the EE process. The idea is to use the log book including quotations, pictures, drafts, personality tests, videos, drawing, etc. to capture the students' learning process. It gives the students an alternative opportunity to see their ongoing results and understand their process of learning.

Using results of entrepreneurship research

Since there are numerous entrepreneurship researchers at SDU, there are frequent initiatives to integrate new insights from entrepreneurship research into EE courses. One of the major achievements is the shift from the narrow entrepreneurship perspective to a more comprehensive approach. The former deals only with the creation of start-ups, whereas the latter is innovation-based. This view also takes into account the region's economic structure and development.

Currently the SDU undertakes research to measure the impact of EE in different study tracks. Results are used to refine course contents and methods (Bager/ Klyver).

18.2.4. Setting of entrepreneurship teaching

Locations

Curricular courses and seminars take place in university-owned seminar rooms.

Timing

EE takes place either in one-week block seminars, or weekly seminars of two hours. Weekly courses are important for frequent and iterative reflections.

Formal evaluation of learning outcomes

1st year Bachelor of Arts participants in the "Design and Business" course were asked to work with 'visual logbooks'. These logbooks require students to document their achievements and reflect on their learning process. The logbooks also enable the educators to understand students' learning processes and filter out good and bad practices. Visual logbooks can in any format, from a written text to a video diary. Students are allowed to use the medium they feel most comfortable with. To date, students had to hand in a written assignment – a synopsis – combined with an oral examination, to get certified for EE courses. This exam is obligatory for all EE participants. Educators are aware that it is hard to evaluate entrepreneurship education, since it is related to intangible values such as "entrepreneurial mind-set". In addition, there is also an online evaluation tool for which there is a low response rate.

18.2.5. Instructors: teachers and mentors

Professors, other employees and external lecturers of the university

SDU employs two types of EE teachers. There are academic lecturers (who partly get trained in EE by IDEA) and there are lecturers from the IDEA Entrepreneurship Centre. Entrepreneurship educators try to make their courses more attractive and lively by inviting external lecturers or partners through partnerships, which are maintained by IDEA.

Theoretical knowledge on entrepreneurship is mainly imparted by members of the IER, at least at Kolding campus. The IER members teach courses about entrepreneurship theory and provide students with an overall view of entrepreneurship and what perspective SDU focuses on. There are lecturers who also have theoretical background, but who focus more on building linkages between theory and practice. Due to this, these lecturers choose action-oriented teaching methods. Other educators are provided by SDU's IDEA Entrepreneurship Centre. Currently, there are about "15 key persons" ("ildsjæle") involved in entrepreneurship education who, according to IDEA's Director, have "substantial activity and experience" in EE.

In a focus group discussion for this case study, it was said that entrepreneurship educators do not see themselves as teachers but as coaches, asking the right questions and triggering self-reflection. Courses taking place on weekly basis are good for reflection and for making the linkages between the courses.

"Real entrepreneurs" as teachers

"Real Entrepreneurs" or members from partnering companies are frequently invited to participate in teaching EE courses. They can present students with problems specific to their start-up, for example, related to growth of their start-up. Students are expected to come up with solutions to these problems. The 'Real Entrepreneurs' can also narrate their own entrepreneurship experiences to the students. Students profit from both these contents; they learn about first-hand experience and consequently, may also be inspired to start their own entrepreneurial activity. Real entrepreneurs function more as role models, rather than teachers.

Mentors

There is no explicit mentoring programme as such. However, students who are interested in start-up activity are given the opportunity to get in touch with business and start-up consultants through IDEA. Due to this, a small start-up community is established and mutual communication nourishes early in the start-up activity phase.

18.2.6. Management of entrepreneurship education

Teacher and trainer management

IDEA manages most of the EE courses at SDU. According to Torben Bager, IDEA is "the mechanism" that facilitates the majority of EE courses at SDU. IDEA staff offers training to academic lecturers and liaises with key persons in different faculties to implement EE courses in various disciplines. It also trains facilitators from different faculties in using action-oriented and activating teaching methods.

The "Training-the-trainer" approach is mostly organised as workshops, where EE teachers and trainers have the chance to share their knowledge with each other, and have a constructive dialogue about literature sources and course descriptions.

Managing student support

IDEA serves as the first contact for students who have a business idea. It provides these students access to a partner and supporter network. It also offers business coaching, but a weakness is a lack of support resources for pre-incubator activity.

Students have constant access to teacher for advice throughout their study duration. Exchanges with external partners help students to implement their theoretical knowledge (see also section 1.3.5.). IDEA also plays an advisory role for students who opt for a career in entrepreneurship.

Internal and external network management

Almost all networking activity is managed by the IDEA Entrepreneurship Centre – recently in co-operation with the knowledge transfer pillar “SDU Business”.

Management of curricular integration and attracting new groups of students

All Danish universities have the overall task of raising the number of students attending an EE course by 5% annually, although no specific time frame has been set by the Ministry of Education. To reach that goal at SDU, there is a top-down initiative carried out by IDEA to *implement at least one compulsory EE course in each accredited study discipline* in an entrepreneurial and innovation-oriented content (see Annex 1). To attract more non-business students, there are marketing initiatives raising awareness for interdisciplinary EE courses. For example, posters invite students to be “someone who can make a difference”, to make them feel as facilitators (see Annex 4).

Furthermore, there is an issue about curricular offers versus extra-curricular activities. Non-credit intrinsic motivation for the topic and obligatory courses enter into a conflict – which is a difficult situation since Danish students are supposed to finish their study programmes within a certain amount of time in order to continue receiving financial support. So giving students the opportunity to work in their own entrepreneurship projects and receiving credit for this could additionally increase the number of students who pick EE courses.

Evaluation of courses and programmes

Officially the evaluation of EE courses and programmes at SDU is a formalised process carried out by online feedback surveys. Since there is a low return rate, EE lecturers started to use *direct feedback* in the courses by asking e.g. “I like ...”, “I wish ...” and “I want ...” in the context of EE goals and outcomes. Students can write down their thoughts and feelings on cards, which are then collected and evaluated in a discussion round. Personal growth of the students is one goal. Interviewed students unanimously expressed their satisfaction with the EE courses that are offered.

18.3. Extra-curricular activities in entrepreneurship education

SDU offers a range of extra-curricular activities. The most important amongst them, i.e. the ones that attract most students, are mentioned below. The courses mentioned below address students of all faculties and disciplines. The examples represent courses that target different interest groups with different backgrounds, from business students to (medical) engineers. They contain different topics of EE at different stages of entrepreneurial expertise of the participants – reflecting that the SDU considers it to be important “to pick the students up where they are”. Thus the examples given also show the variety of SDU’s offerings in EE.

Other than curricular courses these extra-curricular events are directly related to generating business ideas and developing viable business models. Students attending these events show an intrinsic motivation for entrepreneurship and starting-up a business. Whereas “Venture Cup” and “Business Plan Camp” are events, where students are put into a competitive situation for the “best idea”, “Science Innovator” or “DesignIværk” mainly focus on the actual transfer from idea into business concept. This means that participants in those courses actually do have concrete business ideas and need support in commercialising them. One of the main events is the ‘Entrepreneurship Summer School Berlin’, which is a joint project between Danish and German universities and brings together international students from the participating universities in order to pitch, discuss and push forward their business concepts. Due to its very active and lively start-up scene, Berlin has proven to be a very nourishing environment for such work.

Other than curricular courses the extra-curricular courses are supposed to attract students who are intrinsically motivated to participate in EE // nascent entrepreneurs. They want to elaborate upon their actual business idea and develop proper business concepts. One of the advantages for them in taking part in these activities is that they are not only supported but also introduced into a helpful network of supporters.

Exhibit 6: Overview of extra-curricular EE activities at the University of Southern Denmark

No.	Name	Contents	Target group	Offered since	No. of participants
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				[year]	in [year]
1	Science Innovator	Understand concept development and commercialisation of research results	PhD students	2008	15
2	Venture Cup	Idea Challenge	Students, alumni	2012	50
3	Business Plan Camp	24h hours Workshop on Business Planning as preparation for Venture Cup	Students, alumni	2009	20
4	VIIS (Viden, Innovation, SME)	Foster innovation and cooperation between students and companies	Students, companies	2012	100
	Designiværk	Put creative ideas into business context (workshop, homework, coaching)	Students and alumnae in creativity business	2011	50
6	European Summer School Berlin	Working with business ideas, get sparring and coaching from experts, company visits 1-week workshop	Students at SDU and German project partners	2012	30

18.4. Institutional aspects of entrepreneurship education

18.4.1. Organisational set-up and change

Measures for coordinating and integrating EE across the university

The SDU has a centralised but multi-layered approach to entrepreneurship education. First of all there is the Institute for Entrepreneurship and Relationship Management (IER) which covers research and studies within the broader field of entrepreneurship and within the Faculty of Social Science. It employs about 80 people (13 PhD students, 17 associate professors, eleven professors, 37 part-time lecturers, two post-docs, seven research assistants, the remainder administrative staff). The IER offers one specific entrepreneurship Bachelor Programme "B.Sc. in Economics and Business Administration – Entrepreneurship and Innovation" (in Danish only) and one specific Master programme "M.Sc. in Economics and Business Administration – Strategic Entrepreneurship". Currently there are approximately 90 B.Sc. students and 60 M.Sc. students (for more details see chapter 1.2.). As part of IER the Center for Entrepreneurship and Small Business Studies (CESFO) has been established where currently eight people are primarily doing research in the field of entrepreneurship. One of them being the Head of the Global Entrepreneurship Monitor Denmark and thus doing intensive research on entrepreneurial activity and its potential in Denmark.

On top of this in 2005 the IDEA Entrepreneurship Centre (IDEA) was founded by the Danish Ministry of Education. It is a cross-campus and cross-faculty centre aiming at the promotion of entrepreneurship education and training and can thus be seen as the mechanism enabling entrepreneurship education at SDU. Besides IDEA there is "SDU Business" whose main task is the knowledge transfer and thus the networking with external partners. Sometimes competencies from IDEA and SDU Business overlap.

The implementation of new EE courses in existing study lines is handled rather flexibly depending on the gatekeepers in the individual disciplines. There are no bureaucratic barriers.

18.4.2. Laws, statutes and codes

Incentives for staff to engage in or support entrepreneurship education

There is no planned extra motivation incentive for staff members to engage with entrepreneurship education beyond the overall strategic aim of the Ministry for Higher

Education. Those staff members involved in EE as teachers across the faculties mostly participate on the basis of their own intrinsic motivation – they are called “ildsjæle”, people who burn for their interests.

Incentives for other stakeholders contributing to entrepreneurship education

Since SDU is a major provider of highly qualified employees for regional companies a range of external stakeholders also engage in EE on behalf of their own interests. Often they are involved in case based teaching scenarios where students work on their individual problems. Thus the incentive to cooperate with SDU is to get new and/or innovative impulses to their companies.

18.4.3. Mindsets and attitudes

Raising awareness for the importance of entrepreneurship

SDU focuses strategically on giving their students an entrepreneurial profile. Thus the implementation of at least one curricular EE course in each line of study is one step in showing students and letting them experience how their deep knowledge can be transferred in to practical solutions for real life problems. It is even compulsory for all business students to take part in an introductory week, where they (often) for the first time come in touch with the term entrepreneurship and its broader perspective.

SDU pays high attention to the fact that entrepreneurship is more than just starting a business but more a certain way of thinking and behaviour which is solution oriented.

One significant factor in relation to entrepreneurial activity is self-efficacy. Entrepreneurial self-efficacy (ESE) plays a major role in the development of entrepreneurial intentions. Although the overall attitude of students towards entrepreneurship has not been measured, preliminary results about ESE among students do exist (Torben Bager, Formative Self-Efficacy Tests, 2013). ESE is higher among students of higher semesters (MSc) and among those who have participated in explicit EE courses. These results underline the necessity of EE in higher education to establish a sustainable culture of entrepreneurship.

Encouraging entrepreneurial behaviour

SDU encourages entrepreneurial behaviour through their innovative teaching methods and their special extra-curricular EE offers. Venture Cups, Idea Competitions and Summer Schools are designed to encourage and motivate students at all levels – also PhD students – to learn to think entrepreneurially in the sense of creating new value. With IDEA and SDU Erhverv (Business) the SDU has two Centres which can connect these entrepreneurial actors with external business partners – as potential employers, partners and customers. A slight growth in the numbers of students participating hints at the success of those initiatives.

18.5. Outreach to external stakeholders for entrepreneurship education

18.5.1. Types of relationships with external stakeholders

Since most of the organisation and training of educators is organised by IDEA this institution also manages and coordinates the external relationships in EE. For example if an EE educator from SDU needs a business contact for a case work, IDEA can provide them with this information.

Besides this, SDU and IDEA maintain within EE cooperation to a variety of projects with other (international) universities. The Interreg4a project SPICE (Student Programme for Innovation Culture and Entrepreneurship) is one recent example of international cooperation, where 5 Danish and German institutions collaborate on enabling and fostering on-campus start-up activity. The project organises joint EE courses and intensifies its cooperation with regional entrepreneurship facilitators to create a well-functioning entrepreneurship eco-system for students. By enhancing entrepreneurial activity among students the project supports regional economic power and contributes to its innovation potential.

18.5.2. External stakeholders involved in entrepreneurship education

Incubators, accelerators, science parks and technology parks

The Danfoss Global Business Center (DGBC) was established in 2013 as part of the Institute for Border Region Studies at SDU in Sønderborg. Although its focus is on global business and B2B marketing it also touches upon entrepreneurship and EE as it is geared towards the “selection, testing and implementation of novel high-impact global business ideas through active knowledge exchange between businesses and academics”. The three pillars are joint projects with (regional) business, educating future employees and joint workshops and conferences for fostering the transfer of theory into practice.

18.5.3. International relationships

SDU and IDEA Entrepreneurship Center are part of a regional Interreg 4a project which produces and uses synergies between campuses on both sides of the border (German and Danish) to amplify the quantity and quality of EE offerings. Thus it is now possible to take into account the specific regional circumstances, the dependence of the regions Southern Denmark and Northern Germany on each other, and to face these needs with specific programmes that sensitise and motivate students to cross-border business. Alongside this one of SDU’s professors is the head of the Global Entrepreneurship Monitor Denmark (GEM) and thus part of a huge international network of entrepreneurship research and education.

18.6. Impact and lessons learned

18.6.1. Evaluating impacts of the entrepreneurship education approach

Overview of impact evaluation methods applied

SDU measures two indicators that can be used to assess the impact or potential impact of EE on the economy and society: students’ participation rates in EE and students’ entrepreneurial self-efficacy. Beyond this there is unfortunately no quantitative data about students’ entrepreneurial behaviour, start-ups in particular.

Students’ participation rates in EE courses

Since the foundation of the IDEA Entrepreneurship Center and the related emphasis on EE at SDU there has been a measurable impact on students’ **participation rates** in EE. The numbers of students participating in EE courses grew by 47% from 1,757 in 2012 to 2,588 in 2013. This means that almost 10% of all SDU students attended at least one EE course in this period. It also means that SDU reached its goal of increasing the annual rate of students participating in EE courses by 5% of the total number of participants.

Entrepreneurial self-efficacy of SDU students

Preliminary research about the development of **entrepreneurial self-efficacy (ESE)** in SDU students showed that EE courses have a positive impact on students’ judgements about their entrepreneurial competencies. An SDU researcher developed and used an instrument for the measurement of ESE. He asked students about their competencies in creativity, planning and management, marshalling resources, human resource management, financial literacy and managing ambiguity. These competencies are part of a set that is generally used for measuring and predicting entrepreneurial competency and behaviour. The first survey in 2013 included 179 SDU Bachelor and Master students across different study areas.³³⁴ The overall ESE level was found to be highest among students in those study programmes which most clearly focus on entrepreneurship and innovation and on training entrepreneurial knowledge and competencies. These findings are in line with ESE research from other universities (see for example Kourilsky and Walstad 1998 who measured the changes of ESE before and after participating in EE).

Unfortunately the findings about ESE in SDU students cannot be statistically linked with their actual entrepreneurial behaviour, student start-ups in particular. The SDU does not collect and document data about student start-ups (Lone Toftild). However, anecdotal evidence suggests a

³³⁴ Results of a second survey in 2014 were not yet available at the time of writing this case study.

positive impact of increased ESE on SDU students' entrepreneurial behaviour. According to an EE teacher, the example of SDU shows that EE can be seen as some sort of an overarching "umbrella education" that helps students from all areas to **transfer their knowledge into practice-oriented concepts**. The possibility of actively using theoretical knowledge in less abstract situations is a crucial factor for successful EE. Another teacher provided the example of two PhD students who invented a technological device for measuring bacteria in meat but had no idea how to introduce this idea as an actual product into a market. They received training and coaching throughout EE courses and could further develop their idea into a business concept.

In general, IDEA suggests long-term research on the impact of EE on economy (start-ups and innovation) and society (mindsets). IDEA organised a conference on measuring the impact of EE in February 2014, where self-efficacy measurement was presented as one method of making EE impacts tangible.

18.6.2. Lessons learned

Summary of lessons learned from this case

The SDU case offers several lessons learned:

(1) The **establishment of a central entity** like the IDEA Entrepreneurship Center that develops, organises and manages EE programmes **is helpful** when EE is supposed to be introduced and maintained across faculties. Some sort of an umbrella organisation increases the acceptance of EE courses implemented across all disciplines since it avoids potential conflicts of interest and competencies resulting in an image of "fighting over students". Hence IDEA and SDU Business maintain a close and open communication.

(2) SDU experience shows that it makes sense to **move entrepreneurship out of the pure business administration context** to make it more attractive for other disciplines and faculties to integrate EE courses in their curricula. Engineering or medicine students might be discouraged by a pure business context, filled with questions concerning finance or strategy, as it does not meet their idea of realising an innovation or business idea. All engineering students now have to take at least one compulsory course related to EE.

(3) The centralised approach facilitates more or less **independent "train-the-trainer" programmes** for non-business educators and lecturers and supports the multiplication effect. Independent in this context means that providing multipliers does not rely on the individual departments but is outsourced to IDEA. EE is being viewed through an interdisciplinary lens and specialised knowledge is subordinate to EE. It is IDEA's task to provide faculty staff with entrepreneurial competencies that they can transport to their students. They then can themselves put EE in to the right scientific context. In addition to this the trainers have access via IDEA to relevant 'first-hand' businesses, which can support making innovation processes more tangible.

(4) Teaching methods that **activate reflection processes** have shown to be effective in unleashing creative and innovative thinking and acting processes. Thus, and against the background of creating more interdisciplinary courses, the SDU example suggests shifting EE away from simple lecturing to more action-oriented education forms.

(5) Students have a desire to **transform extra-curricular programmes into curricular courses**. Due to the high workload of regular courses it is difficult for students to participate in extra-curricular EE courses since they entail extra work for which they are not credited.

(6) The lack of **solid long-term funding** (independent of third party co-funding) is a factor of insecurity for EE. Thus if entrepreneurship is to be integrated into a university's strategy, solid and long-term funding for entrepreneurship centres like IDEA has to be granted and be considered in annual budgeting. In SDU's case this means that SDU would need an extra amount of approximately 600,000 euro to put into EE (IDEA's annual budget is approx. 1.000.000 euro, thereof 80% are externally funded). This large amount of money is difficult for universities to collect on an annual basis and underlines the importance of external funding.

Transferability to other universities

The SDU's centralised approach of introducing entrepreneurship into its strategy as an interdisciplinary "umbrella education" is definitely transferable to other higher education institutions depending on their financial and organisational capacities.

One has to be aware that the establishment of an entrepreneurship centre like SDU's IDEA centre requires considerable financial effort. The SDU does, however, clearly indicate the advantages of a superior institution like IDEA Entrepreneurship Centre. It facilitates better and more sustainable development, organisation and management as such institutions can supplement each faculty's education programmes.

IDEA's independence from regular curricular activities and requirements facilitates better internal and external cooperation and maintains the knowledge transfer between university and business. Cooperation between IDEA and other universities already exists and a tendency to establish similar entrepreneurship hotspots at these partnering institutions can be observed.

References

Research for this case study was conducted by Prof. Dr. Ilona Ebbers and M.Sc. Kirsten Mikkelsen, both employed at the University of Flensburg (Germany) on behalf of the study for supporting the entrepreneurial potential of higher education (sepHE). Sources and references used include desk research plus the following:

Interviews

- Torben Bager, Prof./ Director of Idea Entrepreneurship Center, 19.05.2014, Kolding
- Suna Løwe Nielsen, PhD/Lector, University of Southern Denmark, 19.05.2014, Kolding
- Lone Toftild, Coordinator/Head of Secretariate, IDEA Entrepreneurship Center, 22.05.2014, Flensburg
- Focus Group Students:
 - Kasper Lundsgaard, cand. merc./MSc Strategic Entrepreneurship
 - Ramona Scheibe, cand. merc./MSc Strategic Entrepreneurship
 - Kristian Aagaard, cand. merc. /MSc International Business
 - Jonas Midtgaard Pedersen, HA/BA Entreprenørskab og Innovation
 - All interviewed 26th May at SDU in Kolding
- Proof reading: Torben Bager, Lone Toftild, Bodil Høeg (both IDEA).

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Annexes

Annex 1: EE courses at SDU in 2013

No.	Name	Contents	Target group	No. of participants in [2013]
1	Entrepreneurship and Design http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=22419&print=1	Objective: To give students an introduction to the intersection between entrepreneurship and design.	BSc Economics & Business Administration – International Business, Design & Business Development Compulsory (Kolding)	31
2	Entrepreneurship and Leadership in Business Administration http://www.sam.sdu.dk/study/fagbasen/admin/fagbesk_admin.shtml?fag_id=23889	Objective: To provide an introduction to key concepts within the field of entrepreneurship.	BSc Economics & Business Administration – Entrepreneurship & Innovation Compulsory (Kolding)	38
3	Strategic Management of Growth Processes http://www.sam.sdu.dk/study/fagbasen/admin/fagbesk_admin.shtml?fag_id=23912	Objective: To enable students to understand and carry out analyses of growth processes in enterprises, so they can obtain knowledge of growth in relation to entrepreneurship and innovation.	BSc Economics & Business Administration – Entrepreneurship & Innovation Compulsory (Kolding)	16
4	Business Start-ups http://www.sam.sdu.dk/study/fagbasen/admin/fagbesk_admin.shtml?fag_id=23996	Objective: Students will gain skills to assess how practical considerations on the establishment of a business include the consideration of regulatory requirements to run a business responsibly.	BSc Economics & Business Administration – Entrepreneurship & Innovation, General Business Economics, International Business Elective (Kolding)	14
5	Business Development http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=21425	Objective: The course builds on "Entrepreneurship & Management" and helps students to identify business opportunities for companies from a theoretical and empirical perspective.	BSc Economics & Business Administration – Entrepreneurship & Innovation Compulsory (Kolding)	26
6	Innovation and Project Management http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=21677	Objective: To provide students with a fundamental understanding of both disciplines (innovation-management and project management) and, in particular, to understand project management from an innovation perspective.	BSc Economics & Business Administration – Entrepreneurship & Innovation Compulsory (Kolding)	22

7	Financing and Growth http://www.sam.sdu.dk/study/fagbasen/admin/fagbesk_admin.shtml?fag_id=23892	Objective: To enable students to understand the issues of funding and capital use, with focus on decisions in small and medium-sized enterprises and start-ups.	BSc Economics & Business Administration – International Business, Entrepreneurship & Innovation Compulsory (Kolding)	42
8	Development of Business Ideas http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=24125	Objective: To provide students with knowledge about different theoretical perspectives on the development of business ideas.	MSc in Design Management Compulsory (Kolding)	46
9	Development of New Business Ideas http://www.sam.sdu.dk/study/fagbasen/admin/fagbesk_admin.shtml?fag_id=24058	Objective: To provide students with knowledge about different theoretical perspectives on the development of business ideas.	MSc Economics & Business Administration – International Business Development, Business Controlling, Management & Leadership Elective (Kolding)	2
10	Intra- and Entrepreneurship Theory and Policy http://www.sam.sdu.dk/study/fagbasen/admin/fagbesk_admin.shtml?fag_id=24037	Objective: The students will be able to work with intra- and entrepreneurship in different contexts and in different political environments.	MSc Strategic Entrepreneurship Compulsory MSc Economics & Business Administration – International Business Development, Management & Leadership Elective (Kolding)	14
11	Idea Generation http://www.sam.sdu.dk/study/fagbasen/admin/fagbesk_admin.shtml?fag_id=24044	Objective: To introduce students to the topic of ideas and how creativity is an essential ingredient in any entrepreneurial process.	MSc Strategic Entrepreneurship Compulsory MSc Economics & Business Administration – International Business Development, Management & Leadership Elective (Kolding)	12
12	International Business Development http://www.sam.sdu.dk/study/fagbasen/admin/fagbesk_admin.shtml?fag_id=24216	Objective: To give the students a thorough understanding of companies' global context, specifically focusing on the global process of change and business processes that affect the company's organisation, activities and their cooperative relations.	MSc Strategic Entrepreneurship, Management & Leadership, Business Controlling Elective MSc International Business Development Compulsory (Kolding)	48
13	Network, Resources and Entrepreneurship Strategy http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=21704	Objective: Aims to get students acquainted with the difference between traditional and entrepreneurial management and the theories of the latter.	MSc Strategic Entrepreneurship Compulsory MSc Economics & Business Administration – International Business Development, Management & Leadership	30

			Elective (Kolding)	
14	Innovation http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=21675	Objective: Aims to give students insight into different perspectives on innovation and the management of companies' innovative activities in the form of new products, services and process innovation, with special emphasis on the development process.	MSc Economics & Business Administration – International Business Development Compulsory MSc Economics & Business Administration – Management & Leadership, Business Controlling Elective (Kolding)	60
15	Methods of Idea Evaluation http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=21703	Objective: Aims to enable students to evaluate new business ideas with the use of scientific methodology.	MSc Strategic Entrepreneurship Compulsory MSc Economics & Business Administration – International Business Development, Management & Leadership Elective (Kolding)	30
16	Internationalisation and Growth http://www.sam.sdu.dk/study/fagbasen/admin/fagbesk_admin.shtml?fag_id=24036	Objective: The students will have an increased understanding of internationalisation and growth in a global and inter- and multi cultural world. One of the key areas in the subject is to create a focus on the intersection of international business and entrepreneurship.	MSc Strategic Entrepreneurship Compulsory MSc Economics & Business Administration – International Business Development, Management & Leadership Elective (Kolding)	18
17	Organizing and Entrepreneurship Facilitation http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=21720	Objective: Aims to enable students to understand the entrepreneurial process as organisational process from the establishment of a business for the creation of a stable organisation.	MSc Strategic Entrepreneurship Compulsory MSc Economics & Business Administration Elective (Kolding)	31
18	Doing Entrepreneurship Research	Objective: To enable students to connect science, methodological procedures and techniques in empirical studies of entrepreneurship.	MSc Strategic Entrepreneurship Elective (Kolding)	12
19	Entrepreneurship in Business Administration http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=22578&print=1	Objective: To introduce students to the entrepreneurial process in a business perspective and to develop their methodological and scientific abilities through a case-based approach in the	BSc Economics & Business Administration Compulsory (Sønderborg)	40

		entrepreneurship field.		
20	The Business Plan http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=22615&print=1	Objective: To teach students tools to develop and implement a business plan.	MSc Economics & Business Administration – Business Relationship Management Elective (Sønderborg)	19
21	Entrepreneurship and Business Understanding http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=22525	Objective: To enable students to understand and explain the fundamental business challenges associated with the development of new or existing businesses.	BSc Economics & Business Management – General Business Economics, International Business, Strategic Communication Compulsory (Odense)	272
22	Entrepreneurship and Small Business Management http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=23106	Objective: Students will understand and can explain the basic business management-related challenges, which can occur in both existing and new companies, as well as those in the development phase.	BSc Economics & Business Administration – Business Management Compulsory (Odense)	73
23	Organisation of Innovation http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=21424	Objective: Students can identify, understand, and explain key points concerning organisation of innovation processes.	MSc Economics & Business Administration – Management of Innovation Processes Compulsory Other MSc Profiles Elective (Odense)	39
24	New Market Development and Innovation http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=21492	Objective: To give students an understanding of how the development of a product takes place in a complex interaction between the abilities of an organisation and the market's needs.	MSc Economics & Business Administration – International Business & Marketing Compulsory Other MSc Profiles Elective (Odense)	115
25	Business Development and Innovation Management http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=22547	Objective: To prepare a professional "Business Plan" based on the participant's own business idea.	MSc Economics & Business Administration Elective (Odense)	98
26	Innovation and Change Management http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=22802&print=1	Objective: To provide students insights into change-management and use this as a starting-point to understand innovation and how it can be brought forth in an enterprise.	MBA – Master of Business Administration Compulsory (Odense)	22

27	Intra- or Entrepreneurship http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=22807&print=1	Objective: To provide insight into how existing firms can renew themselves through Intrapreneurship, and an understanding of how entrepreneurship, the process of creating a new company, is a precursor to this.	MBA – Master of Business Administration Elective (Odense)	10
28	Entrepreneurship http://www.sam.sdu.dk/study/fagbasen/admin/fagbesk_admin.shtml?fag_id=23515	Objective: To enable students to understand and work with the basic conceptual theories on intra- and entrepreneurship, innovation and ideas, and innovation management practices and methods.	BSc Economics & Business Administration – General Business Economics, Sports & Event Management Compulsory (Slagelse)	264
29	Entrepreneurial Management http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=23855	Objective: The students will be able to interpret, compare, reflect and apply research-based theories of entrepreneurial management.	MSc Economics & Business Administration Elective (Slagelse)	15
30	Product Policy and Innovation http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=22067	Objective: To give students an introduction to the theories and knowledge of the management of the company's innovative activities, with a particular focus on product development processes.	Diploma Marketing Management Compulsory (Slagelse)	38
31	Entrepreneurship http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=23854&print=1	Objective: To give students the fundamental knowledge of business economics and the interaction between the two, especially in practice, with entrepreneurship as the focal point.	BSc Economics & Business Administration – General Business Economics, Sports & Event Management, Business Development Compulsory (Ebsjerg)	70
32	Innovation Management http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=22150&print=1	Objective: To give students an understanding of innovation management at the operational level, and first and foremost, on the strategic level.	MSc Economics & Business Administration – Marketing & Innovation, Sports & Event Management, MSc Environmental & Resource Management Compulsory International Graduate Programme Elective (Ebsjerg)	52

Faculty of Humanities

33	Innovation, Project Management and Team Building http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=16069	Objective: The student should be able to develop, analyze, and implement a business or a project idea; analyze the need and interest in this idea; develop and present a plan for implementation of the idea, which is analytically based on knowledge of innovation, entrepreneurship, project and team work.	Minor Subject – Organisational Communication Compulsory (Odense)	50
34	Innovation, Project Management and Team Building http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=16089	Objective: To formulate and refine a business or project idea and formulate a plan for the realisation of the idea into a business.	BA Arabic & Communication, Foreign Language & Communication Compulsory (Odense)	46
35	Innovation, Project Management and Team Building http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=16146	Objective: Introduction to innovation concepts and related concepts of entrepreneurship; the development of ideas and market analysis, such as project concepts, basic elements of project work and concepts of team cooperation, including cooperation in and around entrepreneurial and innovative development projects.	BA Corporate Communications – All Subject Areas Compulsory (Slagelse)	61
36	Innovation Management http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=15958	Objective: To give students an understanding of innovation management at the operational level, and first and foremost, on the strategic level.	MSc International Tourism & Leisure Management Compulsory (Esbjerg)	11

Faculty of Engineering

37	PDI – Innovation Strategy http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=24203	Objective: Students learn to develop an understanding of how firms act strategically, and how their innovation strategy is linked to corporate strategy.	BSc Engineering – Product Development & Innovation Compulsory (Odense)	12
38	Experts in Teams http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=23430	Objective: Students must learn to collaborate on the development of a business idea and to be able to analyze its commercial feasibility.	Compulsory for all BSc Engineering students (Odense)	260

39	<p>Integrated Product Development 1</p> <p>http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=23013</p>	<p>Objective: Students must be able to carry out a development project with emphasis on idea and concept development.</p>	<p>Bachelor in Engineering – Integrated Design</p> <p>Compulsory</p> <p>(Odense)</p>	66
40	<p>Integrated Product Development 3</p> <p>http://www.sdu.dk/Om_SDU/Fakulteterne/Teknik/Ledelse_administration/Administration/Studieordninger_a/integdes_dipling/moduler_e13</p>	<p>Objective: Students must display through analysis, idea development and selection that a product idea can become a reality.</p>	<p>Bachelor in Engineering – Integrated Design</p> <p>Compulsory</p> <p>(Odense)</p>	43
41	<p>Entrepreneurship & Business Development</p> <p>http://www.sam.sdu.dk/study/fag/fag_tek.shtml?fag_id=4902&print=1</p>	<p>Objective: To provide students with the ability to describe innovation and entrepreneurship, and focus on creating a business plan.</p>	<p>Bachelor in Engineering – Manufacturing</p> <p>Elective</p> <p>(Odense)</p>	17
42	<p>Semester Theme 2</p> <p>http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=20714</p>	<p>Objective: Students must aim to apply technical skills to create ideas and translate them.</p>	<p>Bachelor in Civil Engineering – Product Development & Innovation</p> <p>Compulsory</p> <p>(Odense)</p>	36
43	<p>PDI – Project 2</p> <p>http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=24259&lang=uk</p>	<p>Objective: Option B – To work with an own start-up business.</p>	<p>Master in Civil Engineering – Product Development & Innovation</p> <p>Compulsory</p> <p>(Odense)</p>	27
44	<p>Project 1</p> <p>http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=20677&lang=uk</p>	<p>Objective: Option B – To work with an own start-up business.</p>	<p>Master in Civil Engineering – Product Development & Innovation</p> <p>Compulsory</p> <p>(Odense)</p>	47
45	<p>Open Innovation and New Markets</p> <p>http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=24100&lang=uk</p>	<p>Objective: To provide insight into open innovation, inter-organisational relations and market analysis.</p>	<p>MSc Engineering – Product Development & Innovation</p> <p>Compulsory</p> <p>(Odense)</p>	12
46	<p>Product Development and Innovation</p> <p>http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=21681</p>	<p>Objective: To bring together all the key elements involved in the innovation process – the technological aspect of product development, innovation models and process development .</p>	<p>MSc Engineering – Product Development & Innovation</p> <p>Compulsory</p> <p>(Odense)</p>	8

47	Globalisation and Entrepreneurship 1 – Business Establishment http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=20487	Objective: The course will include how opportunities in business start-ups and business models are defined and how sources of funding are identified.	MSc Engineering – Product Development & Innovation Compulsory (Odense)	31
48	Globalisation and Entrepreneurship 2 – The Globalisation of Markets http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=24091&lang=uk	Objective: Students will have an understanding of the many complex issues involved in the globalisation process, with particular focus on businesses and consumer culture.	MSc Engineering – Product Development & Innovation Compulsory (Odense)	46
49	Globalisation and Entrepreneurship 3 – The Global Business Model http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=24094&lang=uk	Objective: Students should be able to identify and combine internationalisation theories, models of globalisation, entrepreneurship and new digital business models.	MSc Engineering – Product Development & Innovation Compulsory (Odense)	26
50	Innovation and Entrepreneurship http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=24149	Objective: Students should be able to work with idea generation techniques and evaluate ideas and models for the development and management of innovation, markets and competitor analysis in terms of feasibility options in a future market.	Bachelor in Engineering – Construction Engineering Compulsory (Odense)	8
51	Making Business http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=23615	Objective: Students will acquire an insight into the development of a new business out of a newly developed product, navigation of technological and business related needs and preparation of prototypes.	BSc Engineering – Innovation & Business Compulsory (Sønderborg)	9
52	Dynamic of Innovation http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=23615	Objective: Students will understand the complexity of interdisciplinary innovation, and how institutions have an impact on innovation processes.	BSc Engineering – Innovation & Business Compulsory (Sønderborg)	9
53	Innovation Management http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=23615	Objective: To introduce the practical and theoretical aspects of innovation management to students.	BSc Engineering – Innovation & Business Compulsory (Sønderborg)	13
54	New Business Model http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=23615	Objective: To describe key concepts and development of new business models.	BSc Engineering – Innovation & Business Elective (Sønderborg)	15

55	New Business Model II http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=22503	Objective: Designed to introduce students to principles, methodology and tools related to the circular economy.	BSc Engineering – Innovation & Business Elective (Sønderborg)	15
56	Discover Innovation and Business http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=24175	Objective: To introduce students to the differences in scientific disciplines involved in innovation and business in theory and in practice.	BSc Engineering – Innovation & Business Compulsory (Sønderborg)	16
57	Technology in Use http://sdu.dk/Om_SDU/Fakulteterne/Teknik/Ledelse_administration/Administration/Studieordninger_a/ib_civ_bach/moduler_f13	Objective: Students will receive knowledge about technology in use, business plans, market analysis and product development processes.	BSc Engineering – Innovation & Business Compulsory (Sønderborg)	13
58	Participatory Innovation http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=22108	Objective: To introduce students to the theories and methods of user-driven innovation.	MSc Engineering – Innovation & Business MSc Information Technology – Product Design Compulsory (Sønderborg)	20
59	Open Innovation Management http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=23269	Objective: To increase the student's knowledge, skills and competencies within theory and practice related to management of open innovation.	MSc Engineering – Innovation & Business Compulsory (Sønderborg)	9
60	Innovation of Technology and Business http://www.sam.sdu.dk/study/fagbasen/fagbesk.shtml?fag_id=23666	Objective: To give students an introduction to the topic of innovation management and technological innovation from a practical perspective.	MSc Engineering – Innovation & Business Compulsory (Sønderborg)	18

Faculty of Health Sciences

61	Entrepreneurship and Innovation http://static.sdu.dk/mediafiles/1/9/E/%7B19E10868-4ED3-4743-ABAF-81A7441765EB%7DStudieguide%20IIE%20Final%20E2013.pdf	Objective: Students will develop skills to identify, plan, evaluate and implement new commercial, public and social ideas aimed at customers/users within the sports and health professions.	BSc Sport & Health (Odense)	25
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Annex 2: MSc Entrepreneurship programme description



MSc in Economics and Business Administration – STRATEGIC ENTREPRENEURSHIP

This educational programme provides you with the ability to identify and create new business opportunities



➤ CARREER PROSPECTS

Strategic Entrepreneurship provides you with comprehensive theoretical and hands-on knowledge of entrepreneurship. The programme aims to provide you with the managerial capabilities needed to work in, develop and facilitate entrepreneurial activities in international contexts, by combining knowledge of entrepreneurship, business development and networks with an international perspective.

In particular, the programme focuses on the managerial role of facilitating three phases of the entrepreneurial process:

- Identifying and creating new business opportunities
- Assessing and evaluating entrepreneurial opportunities, and
- Organising to explore entrepreneurial opportunities

➤ TUITION FEES

EU and EEA citizens do not pay tuition fees. **Non-EU/EEA citizens** are required to pay tuition fee.

Master level: A full master degree equals 120 ECTS: EUR 17,000.00

➤ ENTRY REQUIREMENTS

For Non-EU/EEA citizens

The IELTS (or TOEFL) test is necessary if your first degree was taken outside the European Union, Scandinavia, Switzerland, USA, Australia, or New Zealand. An IELTS score of at least 6.5 or a TOEFL score of at least 575 paper based, at least 230 computer based and at least 88 internet based.

PLEASE NOTE: The University of Southern Denmark has access to the IELTS Verification Service; therefore we accept the IELTS test results/score in copy. TOEFL is only accepted in the original sent to the University of Southern Denmark directly from the test centre or the educational testing service (ETS) before application deadline.

EU/EEA citizens are also required to document their English skills either by the tests mentioned above or, by way of your secondary school diploma if you have acquired an upper intermediate level in English comparable to the Danish B level (min. 210 FULL hours at high school level).

Language requirements for EU/EEA, Nordic and Swiss citizens:

➔ www.sdu.dk/en/Uddannelse/Op-tagelse/English+language+requirement

➤ ENTRY REQUIREMENTS

- A degree of BSc in Economics and Business Administration gives the right to admission to the master programme.
- Applicants with a combined bachelor degree within Economics and Business Administration are qualified for admission to the master programme.

In order for a bachelor degree to be deemed as providing qualifications similar to those of the BSc programme, the bachelor programme must include 75 ECTS credits covering the disciplines within economics and business administration. This means that the following subjects of a certain standard and depth must be documented: 1) Micro-economics 2) Accounting and finance 3) Statistics and Methodology 4) Marketing and 5) Organization.

➤ APPLICATION DEADLINES

Starting 1 September 2013

- Non-EU/EEA citizens: 1 Feb 2013
- EU/EEA citizens: 1 Apr 2013

Starting 1 February 2014

- Non-EU/EEA citizens: 1 Aug 2013
- EU/EEA citizens: 1 Nov 2013



STUDENT

Sebrena Ewald
BSc Arts in Graphic Design,
now studying
STRATEGIC ENTREPRENEURSHIP

"The most interesting part for me is to learn how to grow my business globally. I expect with this education to be able to start and build many businesses. To be able to structure them in a way that I can manage; to grow very fast here in Europe and back home in the US."

MSc in Economics and Business Administration in Kolding • full time

➤ STRATEGIC ENTREPRENEURSHIP: Programme structure (120 ECTS)

4 th term The Master Thesis	MASTER THESIS 30 ECTS			
3 rd term Field Studies of Entrepreneurship	THE THREE OPTIONS SEMESTER Internship in a company/institution (Denmark or abroad) + additional course <i>or</i> Studies abroad (International partner university or another international university) <i>or</i> Studies at the University of Southern Denmark or another Danish University 30 ECTS			
2 nd term The Evaluation and Realisation of Entrepreneurial Opportunity	Network, Resources & Entrepreneurship Strategy 10 ECTS	Methods of Idea Evaluation 5 ECTS	Performance Measurements & Financial Planning 5 ECTS	Organisation & Entrepreneurship Facilitation 10 ECTS
1 st term The creation of Entrepreneurial Opportunity	Intra- and Entrepreneurship Theory and Policy 10 ECTS	Internationalisation & Growth 10 ECTS		Project Management 5 ECTS
				Idea Generation 5 ECTS

➤ PROFILE

1st term

The Creation of Entrepreneurial Opportunity

The first term concentrates on the identification and creation of entrepreneurial opportunities, setting the stage for the remainder of the programme and focusing on entrepreneurial activity and innovation.

2nd term

The Evaluation and Realisation of Entrepreneurial Opportunity

The second term focuses on the challenge of evaluating, utilising and facilitating entrepreneurial opportunities in new or existing firms.

3rd term

Field Studies of Entrepreneurship

Internship in a company, or study abroad, or courses at the University of Southern Denmark.

4th term

The Master Thesis

➤ PEDAGOGY AND COURSE EXAMPLE

We teach about and in entrepreneurial topics and processes. Teaching about theory, concepts and methodology is a must in any academic study, but the study of entrepreneurship also requires that students involve themselves in real life or simulated real life entrepreneurial processes.

An illustration: The 1st term Idea Generation course mixes lectures, discussion and group work. Students will experience and develop their own capability as creators of new ideas in social contexts. Moreover, in groups they will work as facilitators of idea generation processes in an innovation camp for bachelor students, thus learning by doing and reflecting.

Watch the movie:

"The choice of great opportunities"
http://www.youtube.com/watch?v=jGP_TdQfp0s

➤ FURTHER INFORMATION

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 E-mail: eko@sam.sdu.dk

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Uddannelsen er akkrediteret af Akkrediteringsrådet ACE.

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 University of Southern Denmark
 Engstien 1, 6000 Kolding

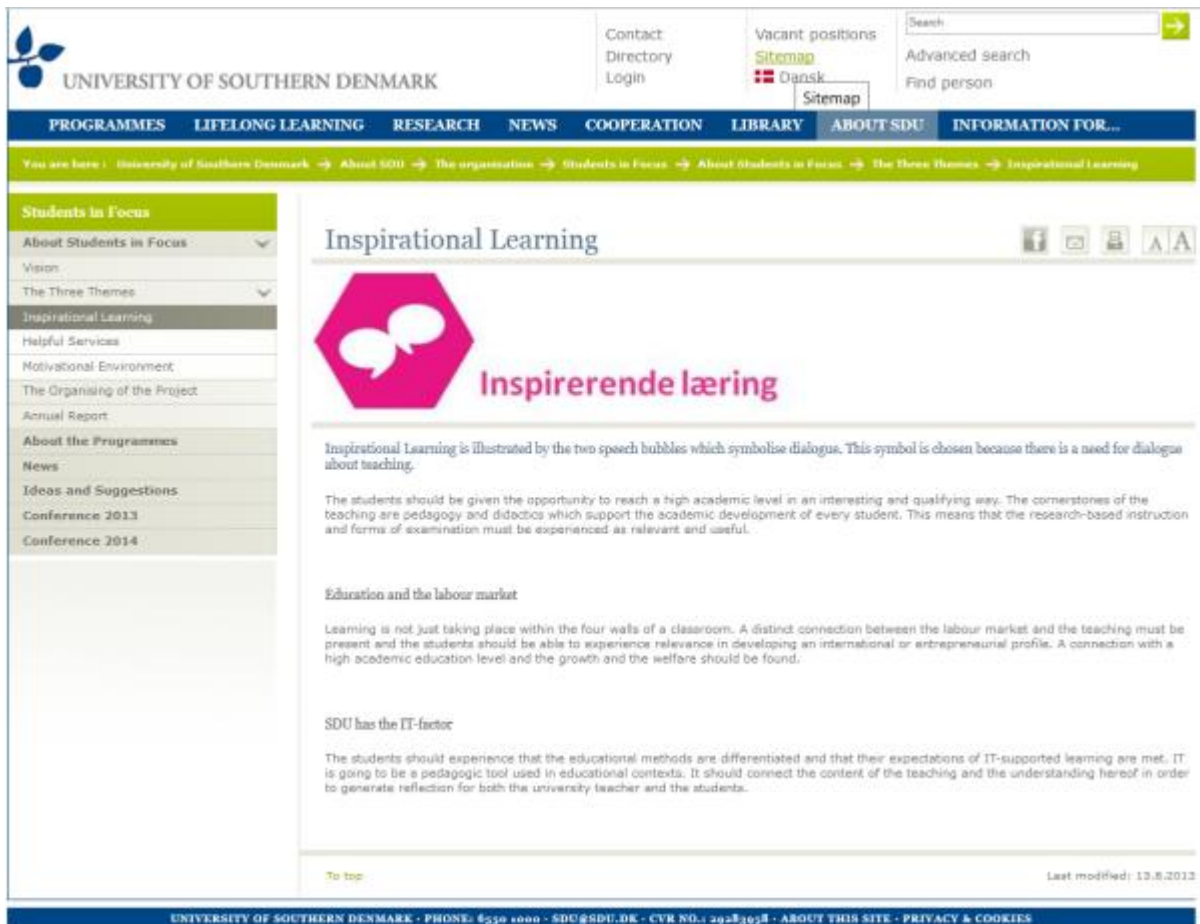


STUDENT

Lasse Bøding
 BSc International Sales & Marketing Management, now studying STRATEGIC ENTREPRENEURSHIP

"I chose Strategic Entrepreneurship because I wanted a theoretical basis for starting my own company. Our lectures reach the expected academic level and relate to praxis, just as I prefer. I give SE my warm recommendations to anyone who wish to develop their entrepreneurial capabilities and gain a structure for thinking through concrete opportunities."

Annex 3: Entrepreneurship within SDU's overall goal of strengthening its education profile through the project "Students in Focus"



The screenshot shows the website for the University of Southern Denmark (SDU). The header includes the SDU logo and navigation links such as 'Contact', 'Directory', 'Login', 'Vacant positions', 'Sitemap', and 'Danish Sitemap'. A search bar is also present. The main navigation bar lists 'PROGRAMMES', 'LIFELONG LEARNING', 'RESEARCH', 'NEWS', 'COOPERATION', 'LIBRARY', 'ABOUT SDU', and 'INFORMATION FOR...'. A breadcrumb trail indicates the current page: 'You are here: University of Southern Denmark → About SDU → The organisation → Students in Focus → About Students in Focus → The Three Themes → Inspirational Learning'. The left sidebar contains a 'Students in Focus' menu with options like 'About Students in Focus', 'Vision', 'The Three Themes', 'Inspirational Learning', 'Helpful Services', 'Motivational Environment', 'The Organising of the Project', 'Annual Report', 'About the Programmes', 'News', 'Ideas and Suggestions', 'Conference 2013', and 'Conference 2014'. The main content area is titled 'Inspirational Learning' and features a pink hexagonal logo with two speech bubbles. Below the logo, the text reads 'Inspirerende læring'. The page contains three main sections: 'Inspirational Learning is illustrated by the two speech bubbles which symbolise dialogues. This symbol is chosen because there is a need for dialogues about teaching.', 'Education and the labour market', and 'SDU has the IT-factor'. The footer includes contact information and a 'Last modified: 13.8.2012' timestamp.

Source:

http://www.sdu.dk/en/Om_SDU/Organisationen/destuderendeicentrum/Om+De+studerende+i+centrum/Tre+m%C3%A5l/Inspirerende+l%C3%A6ring

Annex 4: Example of visibility of entrepreneurship education on Campus



19. Tampere University of Applied Sciences, Finland: team learning and team entrepreneurship

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Abstract



Tampere University of Applied Sciences (TAMK) has a major programme in entrepreneurship education (EE) named Proacademy. It started in 1999 and focuses on team learning and team entrepreneurship. Proacademy students spend 2.5 years working as team entrepreneurs, setting up a real company. Students establish own learning targets individually and as a team, supported by a coach and set down in learning contracts. The most important learning tools are dialogue as well as "birth-giving" and feedback sessions. Proacademy is designed as a multi-disciplinary EE study programme, unit and environment mainly for students from Business Administration and Business Information Systems. In autumn 2012, TAMK set up an additional EE unit named "Y-kampus" for mainstreaming EE in the whole university. It provides entrepreneurship courses, events and mentoring services, as well as dedicated EE premises. All TAMK curricula include some EE elements, which are organised by and at the Y-kampus. Y-kampus uses learning approaches similar to Proacademy. Its courses can be included in students' degrees as free choice or alternative studies. Y-kampus also organises coaching courses for TAMK's personnel. Y-kampus' activities are still being developed, with a view to providing services to third parties such as students from the other three Tampere universities as well as start-ups that are already up and running. TAMK's emphasis on entrepreneurship has notable impacts: 20 – 25% of graduates start a company, compared with less than 5% for all university graduates in Finland.

Case study fact sheet

▪ Name of the university:	Tampere University of Applied Sciences (TAMK), Tampere, Finland
▪ Legal status:	Public (City of Tampere has 87% ownership)
▪ Campuses:	Seven campuses in the Pirkanmaa region: Tampere (four sites, incl. the main campus Kuntokatu), Ikaalinen, Mänttä-Vilppula, and Virrat.
▪ Year of foundation:	1996
▪ Number of students (year):	9,630 (2013) (Degree students. Total students in 2013: 10,477)
▪ Number of employees:	761 (2013). Thereof: 316 Teaching staff; 20 R&D&I; 425 Other
▪ Budget (most recent financial year)	EUR 73,622,000 (2013)
▪ Academic profile:	As a polytechnic, TAMK is oriented towards work life. Six schools offering degree-awarding education: School of Wellbeing and Social Services; School of Business and Services; School of Construction and Electrical Engineering; School of Art, Music and Media; School of Industrial Engineering; School of Health Care. The Tampere Business Programme was awarded the first prize Quality Unit by the Finnish Higher Education Evaluation Council for 2010 – 2012, recognising outstanding quality of Proacademy.
▪ Entrepreneurship education profile:	Proacademy programme in EE started in 1999; Y-kampus unit set up in 2012 for mainstreaming EE all over the university
▪ Activities focused in this case study:	Cooperative entrepreneurship approach practised in Proacademy, a multi-disciplinary entrepreneurship education study programme; and Y-kampus

	<i>entrepreneurship unit providing EE to all TAMK students</i>
▪ <i>Case gatekeeper:</i>	<i>Riitta-Liisa Arpiainen, Senior Lecturer, Business and Administration Programme, Tampere University of Applied Sciences</i>

Information included in this case study is from end of year 2014 unless stated differently.

19.1. The university's entrepreneurial profile

19.1.1. The university's overall approach to entrepreneurship education

Key characteristics of EE at TAMK

Tampere University of Applied Sciences (TAMK)³³⁵ is one of 24 polytechnics in Finland. As such it is heavily oriented towards work life, offering professionally-oriented education for the needs of the labour market and conducting R&D that supports teaching and promotes regional development. In its entrepreneurship education (EE) offers, TAMK applies an innovative approach to entrepreneurship education (EE), focusing heavily on co-operative and **team entrepreneurship**. TAMK has two major EE facilities: Proacademy and Y-kampus. Both are overarching units serving different study programmes.

Proacademy is a multi-disciplinary EE study programme, unit and environment that started in 1999. It is mainly for students from Business Administration and Business Information Systems programmes seeking a Bachelor of Business Administration degree. Proacademy students spend 2.5 years working as team entrepreneurs in real companies they set up specifically for this purpose. Each Proacademy team consists of ten to 20 students who jointly carry out about 20 to 30 projects per year through which they develop and apply business ideas and generate real turnover. The Proacademy approach lets students define their own learning targets individually and as a team, supported by a coach and laid down in learning contracts. At team level the most important learning tools are dialogue, innovation and "birth-giving" sessions as well as feedback sessions.

In addition to Proacademy, a dedicated unit named **Y-kampus** has been set up in autumn 2012 for mainstreaming EE in all of the university's course programmes. Y-kampus offers entrepreneurship courses and events as well as coaching and mentoring services. It also provides dedicated entrepreneurship study premises to all students and teaching staff of TAMK. All curriculums of TAMK include some elements of EE, which are organised by and at the Y-kampus. Y-kampus makes use of learning approaches similar to Proacademy, i.e. learning by doing, learning in teams as well as learning through reflection, feedback and dialogues supported by coaches. For the future it is expected that Y-kampus will have an even stronger role in EE not only at TAMK but also for the other three higher education providers in Tampere as well as for existing start-ups seeking advice and mentoring.

Publicity of the TAMK case

In Finland, TAMK's EE activities are very well known. TAMK's business programme, which includes the Proacademy option, won the Quality Award from the Finnish Higher Education Evaluation Council in the category "Quality Unit", i.e. the first prize of all business programmes of universities of applied sciences in Finland, for 2010 – 2012. It recognised the outstanding quality of Proacademy.

Proacademy's team entrepreneurship approach has also attracted broad interest from entrepreneurship education providers from other countries. Large numbers of visitors come to Tampere each year to take a closer look: In 2013, there were about 1,000 visitors from 16 countries. TAMK provides advice and support to polytechnics around the globe that want to apply a team-based approach to EE, e.g. in Namibia and Bristol (UK). However, TAMK's approach may not yet be well-known across the EU.

³³⁵ Official name since 1 January 2015: Tampereen Ammattikorkeakoulu Oy.

19.1.2. Leadership and governance

Importance of government strategies

Proacademy and Y-kampus are home-grown developments driven by proponents of modern approaches to EE at TAMK. The heightened focus on effective methods to teach entrepreneurship, however, is fully in line with the Finnish Ministry of Education's "Guidelines for Entrepreneurship Education" published in 2009. These guidelines encourage the establishment of EE but include no financial support to TAMK and no legal requirement to establish EE.

Importance of entrepreneurship in the university's strategy

The university's current strategy puts clear emphasis on TAMK's entrepreneurial profile. There are six focus areas in the strategy, with **entrepreneurship pedagogy** and **wellbeing entrepreneurship** two of them. Entrepreneurship pedagogy relates to the further development of the innovative approaches to EE applied at Proacademy and Y-kampus, namely team entrepreneurship and team learning. Wellbeing entrepreneurship indicates a commitment to mainstreaming EE within one of TAMK's core educational fields, Wellbeing and Social Services. One of the "Operational principles" of TAMK is to "apply an entrepreneurial attitude to obtaining the best outcomes for TAMK as a whole".³³⁶

Extent of high level commitment to implementing entrepreneurship

The extent of high-level commitment to implementing entrepreneurship education is demonstrated by the following initiatives initiated or supported by TAMK's top management:

- In autumn 2012, establishment of **Y-kampus**, a unit exclusively dedicated to entrepreneurship, with its own premises and marketing strategy.
- Application of team entrepreneurship learning within the **Media Study Programmes** at TAMK's campus in Virrat.
- Use of co-operative entrepreneurship elements in the **Information Technology Study Programme**, in collaboration with many outside enterprises.
- Use of a virtual company learning environment (Kykylaakso Business Learning Environment) in the **Business Study Programme**, compulsory for all first-year students.
- Move of the degree programmes in **Media and Arts** to Mediapolis, an international campus concentrating on content production and ICT, bringing together enterprises and students to work side-by-side in an environment fruitful for entrepreneurial thinking.

Level of faculties' and units' autonomy to act

When Proacademy was founded in 1999, it was a totally new way of learning, and its strong focus on entrepreneurship was uncommon at that time. Against this background, Proacademy was understood as a laboratory for experimenting with innovative ways of education focusing on entrepreneurship. The intention was to establish a space in which TAMK (mainly its Business and Administration Programme at that time) could experiment, without any direct impact on the University's other, traditional course programmes. This meant that Proacademy was given a strong degree of autonomy in developing its methods.

In the meantime, the approach invented at Proacademy has found its way into other course programmes at TAMK, in particular into Business Administration. With the start of Y-kampus in 2012, a totally new organisational unit was launched which is now responsible for providing and further developing EE throughout TAMK.

Organisational implementation

The **Proacademy** campus is located outside of the central TAMK campus, in a brownstone building in an early-industrialised part of the city which has been converted into a fashionable centre of young, high growth companies, museums, theatres, coffee shops and so forth.

For many years, each curriculum at TAMK has included some components of EE. However, only since 2012, when **Y-kampus** was founded, there is a dedicated unit in charge of centrally organising EE at TAMK. Y-kampus is also offering training courses for TAMK's personnel. In the

³³⁶ See "TAMK's strategy for 2010-2019", [http://www.tamk.fi/cms/tamken.nsf/\\$all/CD1DE6F6FAEC8171C225763A00351BE6](http://www.tamk.fi/cms/tamken.nsf/$all/CD1DE6F6FAEC8171C225763A00351BE6), downloaded 27/11/2014.

future it is expected to provide courses and events targeting students from other Tampere universities as well as existing start-ups.

University's importance for driving entrepreneurship in its environment

TAMK is one of four higher education institutes in Tampere and the surrounding region of Pirkanmaa.³³⁷ Of these, TAMK has traditionally been the one with closest links to the local labour market, and as such has been affected strongly by the recent economic crisis – which has culminated in the radical downsizing of Nokia's workforce in the region. This has led to a strong increase of interest shown in EE as practised at TAMK. While entrepreneurship was considered as something strange until a few years ago, it has become a kind of guiding principle for economic revitalisation of the region.

The impact of TAMK's emphasis on entrepreneurship is reflected in the fact that approximately 20 to 25% of Proacademy graduates start a company,³³⁸ compared to a figure of less than 5% for all university graduates in Finland.

19.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

Proacademy currently has five coaches, including the Head Coach, who is also the Head of the Proacademy (Mr. Veijo Hämäläinen). He reports to the Director of Education, School of Business and Services. Pro-Academy does not have any non-teaching staff.

The **Y-kampus** team comprises of two teaching staff / coaches working full-time and seven who work part-time. The main link to existing businesses is provided by Proacademy alumni who are now working as entrepreneurs, and who support current students in their role as (volunteer) mentors. At the end of 2014, there are nine mentors active at Proacademy and Y-kampus.

Financial resources for entrepreneurship education

In the development phase of Y-kampus, TAMK received funding support from the European Social Fund.

Running costs for EE at TAMK are funded from the University's general budget. No additional financial resources, e.g. from the business community, are used.

Notably, Proacademy teams do not receive any kind of start-up capital when setting up their company in the first stage of the programme. On the contrary, team enterprises are asked to pay a small rent for the premises and also for office supplies etc. In Bristol (UK), where a similar programme has been launched, student companies do receive start-up capital, meaning that the costs for providing training for team entrepreneurship are considerably higher.

19.2. Entrepreneurship in curricula and teaching

19.2.1. Overview about curricular offers

Curricular offers by Proacademy

The **Proacademy** programme lasts 2.5 years and can be taken as a fully credited part of a Bachelor study programme in Business Administration, Health Care or Hospitality Management. On Master level, the Proacademy course is open for participants of the programme Master Degree in Entrepreneurship (Master of Business Administration)

The study modules of the 2.5 years spent at the **Proacademy** are the following:

- **Developing Entrepreneurial Skills:** Starting a Team Enterprise; Experience Economy and Team Entrepreneurship; Building a Business Network; Growth Entrepreneurship; Profitable Business; Final Camp.

³³⁷ The others are University of Tampere (16,000 students), Tampere University of Technology (12,000 students) and the Police College of Finland.

³³⁸ Source: Annual survey of graduated TAMK students.

- **Successful Business Operations:** Learning Organisation; Sales, Customer Relations and Networking; Leadership and Management; Marketing Communications; Corporate Finance; Global Business; Creative Products and Business Models; ICT Entrepreneurship; Sustainable and Responsible Business; Trade Specific Competence; Experience Economy.
- **Language Studies 2:** Elementary German/Spanish/French/Russian; Basic German/Spanish/French/Russian; Intermediate German/Russian.

In addition to these modules, projects, free-choice studies, practical training and the Bachelor's thesis are all compulsory elements of the course programme. The following box-text provides an overview about the Proacademy degree programme in business administration.³³⁹

Overview: Degree Programme in Business Administration, Proacademy

Degree: Bachelor of Business Administration

Scope and duration: 210 credits (cr), 3.5 years

Location: Business School, Kuntokatu 3, Proacademy Finlayson

Head of the Business Programme: Milja Valtonen

Head of Proacademy: Veijo Hämäläinen

Skills developed in the degree programme: The framework for studying at the Proacademy is the team enterprise founded at the beginning of the studies. Through working in the team enterprise, the students learn various aspects of business, such as developing a business idea, productisation, sales, marketing, financial management of a company and leadership. The students also constantly learn collaboration and organisational skills, such as team learning and giving and receiving feedback. The students continuously apply the skills they have learned by implementing customer-based projects through their team enterprise.

Working life placement: Annual graduate surveys show that 20 to 60% of graduates continue as entrepreneurs, and the rest find employment in diverse tasks in their working life. The interests discovered during the studies guide the career choices. In many cases, graduates find employment through the contacts acquired during the studies.

Value basis for education: Proacademy offers the possibility for team entrepreneurship, international work and unique networks. The value path of Proacademy – trust, courage, actions, learning and success – describes the learning process.

Teaching methods: Learning in Proacademy requires being present and active participation. Important learning methods at Proacademy are dialogue, reading professional literature and producing essays, seminars, innovation tasks and customer projects. During the first year of studies, the students study the basics of Business Administration, for which they participate in the foundation modules which are compulsory for all students of TAMK Business School. They apply for Proacademy during the spring of their first year of studies, and one criterion for entrance is successful completion of all first year studies. During the second and third year of studies the students complete 90 credits worth of Proacademy professional studies. The studies also contain practical training (30 cr) which is carried out as project studies and the Bachelor's thesis (15 cr). The students select their free-choice studies (15 cr) either from the Degree Programme of Business Administration or from other degree programmes. The studies are completed in 3.5 years.

Proacademy specialised studies (90 ECTS credit points): To a large extent, students can decide themselves how to accumulate the 90 Prokatemia Specialised Studies credit points. They make their own study plan within a set framework and work accordingly. These specialised studies comprise literature study from various professional fields, seminar lectures, visits to companies, web-based learning activities, team meetings, project work, and incubation sessions for promoting the generation of innovative ideas. In order for the credit to be counted in the Specialised Studies category, the fields of study should be chosen from among the following:

³³⁹ Adapted from <http://opinto-opas-ops.tamk.fi/index.php/en/167/en/49598/15PRO/year/2014/classification/17> (retrieved 2014-10-09).

marketing, project management, development of learning skills, innovation, education for entrepreneurship, advanced teamwork skills, or development of IT environments.

Curricular offers by Y-kampus

At **Y-kampus**, TAMK's EE unit for all fields of studies, students can choose from nine different course programmes. Courses serve beginners as well as advanced students and last between three and six months. Course participants are eligible for receiving credit points. The number of individuals enrolled in courses is 150 per year. Y-kampus's activities are still being developed.

Exhibit 19-1: Overview about curricular EE offers at TAMK's Y-kampus

No.	Name	Objectives	Target group	Offered since
1	Towards being an entrepreneur	Test of entrepreneurship abilities and skills, development of competences through practical examples and work	Beginners	2012
2	Concept Workshops	Students solve product and service development assignments given by companies, the public sector and non-governmental organisations and work with diverse assignments in multidisciplinary teams with support of coaches	Beginners	2012
3	Marketing and Sales for Entrepreneurs	Multidisciplinary student teams learn marketing means and trends and implement a practical marketing project. Development of marketing and sales competence in practice.	Beginners	2012
4	Business Project	Learning through a practical, commercial project. Development of projects based on own interests and skills in multidisciplinary teams. Covers project management, contracts, jurisprudence, creation, innovation, sales, marketing, management, and financial competence.	More advanced	2012
5	Business Development	Planning and implementing a real-life business development project as a team, team dialogue workshops, study of relevant business literature and writing reflective essays.	More advanced	2012
6	Business Camp	One-week entrepreneurship camp (during the holiday weeks in the autumn and spring) to develop innovative business ideas, build networks, and acquire valuable business competence. Focus on creation, development, productisation & commercialisation of business ideas; customers, customer segments, sales and marketing from the viewpoint of business idea commercialisation.	Business idea developers	2012
7	From Idea to Enterprise	Skills for development of a business from one's own business idea, including financial competences. Practical work, assignments and teamwork. The course qualifies students to apply for a business start-up allowance.	Business idea developers	2012
8	Growth Entrepreneurship	Focus on enterprise growth and related demands on management. Based on study of successful local examples of growth enterprises and their stories.	Business idea developers	2012
9	Entrepreneurship Sling	Allows students to collect credits by participating in coaching meetings to develop their business idea, plus Y-kampus events, workshops, projects, seminars, and other entrepreneurship related activities available. Hop in – hop out: Credits are awarded according to performance and activeness. No binding beginning or ending dates.	various	2012

19.2.2. Target groups

Target groups of Proacademy

Study programmes and students' backgrounds

Proacademy has been designed as a multi-disciplinary entrepreneurship education study programme, unit and environment mainly for students from Business Administration and Business Information Systems programmes. All of these lead to a **Bachelor of Business Administration**. The three and half year Bachelor's degree (210 ECTS) includes two and half years spent at Proacademy, before which a common foundation of skills and knowledge in business or information technology (60 ECTS) has been laid in the first year.

The Proacademy course is also open – but not mandatory – for participants of the course programme Master Degree in Entrepreneurship (**Master of Business Administration**).

In 2014 Proacademy was launched as an option for additional study programmes: **Nursing and Health Care** (Bachelor of Health Care) and **Tourism** (Bachelor of Hospitality Management). The first teams in both of these areas have started their Proacademy programme. It is expected that Proacademy will be offered to students of more and more study programmes in the future.

Approximately one third of successful applicants to Proacademy have some experience in managing a business already, either because they have set up a company already or they have been involved in a family business.

Proacademy counts approximately 90 to 100 students in the autumn term and about 60 to 70 students in the spring term.³⁴⁰ According to current estimates, this number may rise to 170 within two years.

Special target group: potential family business successors

A special target group is individuals who already work as entrepreneurs or have grown into a **family business** which they are expected to take over. The Tampere region faces a challenge in the form of family businesses for which a transfer to the next generation is uncertain: In a survey by the Pirkanmaa Entrepreneurs' Association published in 2012 comprising 2,830 small and medium-sized enterprises whose owner is older than 55 years, 38% of respondents reported that they do not have a successor within the family. This is a common problem all over Finland. Proacademy was found to be in principle well-suited for students who are involved in managing a business in parallel, as there are few fixed schedules that need to be followed. However, the level of commitment required for Proacademy means that this can be challenging.

Selecting the right candidates

The Proacademy represents a way of learning which certainly does not suit everybody. The main challenge is the dissolution of a clear separation between private life and studies. This can be very stressful for some types of students. In order to make sure that students are well chosen for the programme, applicants are very carefully interviewed, and a discussion takes place with their first-year tutors. The interviews have the main goal to identify the real motivation behind the decision to apply for Proacademy.

The purpose of these interviews is to assess whether a student has any major issues that might make it difficult for her or him to endure the level of stress and pressure typical of participating in the programme. Such pressure can be considerable, in particular because students cannot take their own decisions according to their personal preferences; everything is decided and done as a team. Thus, applicants should be team players or willing to become one. Care is being taken not to attract students to Proacademy who search for a way to avoid exams. The aim is that no student should have the idea that Proacademy is an easy way to obtain a degree – which definitely is not the case according to the statements of both coaches and students, current and former ones.

The application process for Proacademy is as follows: All students have to spend the first full year of their studies, for example in business management, in a traditional setting. During this time, they have the possibility to learn about Proacademy, for example by coming across one of its roadshow events.

Currently Proacademy receives about 80 applications per year, of which about 50 are accepted. It is possible to apply from other universities to Proacademy, i.e. the programme is open to

³⁴⁰ The difference is due to the fact that each year two teams of about 30 students graduate at Christmas time, while two new teams of 30 – 40 students start their studies at the beginning of the autumn term.

students who have spent their first year of study in, for instance, business administration at another university.

Target groups of Y-kampus

Students enrolling in Y-kampus courses and activities come from any of the TAMK departments – so far from more than 20 different study programmes, but mostly from business and engineering departments. During the first two academic years, about 2,000 participants – TAMK students and personnel – have participated in the various Y-kampus courses and events: about 300 participants in the courses and 1,700 in the different extra-curricular activities.

Continuous education

Continuous education is not yet an explicit focus of EE activities at TAMK. However, the nine study courses offered by Y-kampus are open to any interested party. This includes individuals who have finished their studies already but are interested in continuous education. This group includes entrepreneurs who are in the process of setting up a business or employees who consider starting their own company. So far, numbers of Y-kampus course participants from outside of TAMK are modest, as the offer has been launched only two years ago, but for the future more intensive marketing efforts are foreseen.

Bridges to secondary education

Y-kampus offers are not yet targeting pupils in secondary education, although they are in principle open to any interested individual from Tampere.

19.2.3. Designing lectures and courses – basic curricular decisions

Objectives

The objectives of **Proacademy** are reflected in its "vision for 2019", which is stated as follows (see also the related Exhibit):

- **Trust:** Proacademy is the most inspiring Finnish entrepreneurship community.
- **Courage:** At Proacademy we are willing to grow: We challenge one another to surpass ourselves and use the global opportunities.
- **Actions:** ProAcademians are agile to scan new business ideas, keen to put digital possibilities into practice, and tough entrepreneurs with the will to succeed.
- **Learning:** Proacademy is a role model in learning and working together and in professional development.
- **Success:** Proacademy is the best source of knowledge and competence for entrepreneurs of the 2020s.



The objectives of **Y-kampus** are to help any interested person to meet three goals:

- Implement entrepreneurship projects and studies, develop their business idea, and search for business partners;
- Meet entrepreneurs, create their own networks, and get an idea of different career options;
- Test ideas and try their wings in real world business already during their study time.

Contents and methods

Applying the TeamAcademy concept

The approach applied at Proacademy is based on the **TeamAcademy concept** originally developed by Johannes Partanen at Jyväskylä University of Applied Sciences (JAMK), another Finnish polytechnic, from 1993 onwards.³⁴¹ The originators spread the TeamAcademy approach to many other countries. The differences between Proacademy and the TeamAcademy model are quite intricate, as both have developed independently from each other since Proacademy was launched. Both have been continuously improved and revised over the years. A major difference is that the TeamAcademy programme starts with the day students enrol at the university, while Proacademy starts only after students have undergone one year of traditional studies, for example in business management.

Working in real companies

Team work at and in a **real company**, established by the team itself, is at the centre of the Proacademy concept. While traditional business education at TAMK operates with fictional companies, Proacademy students establish a real company and deal with real money. Proacademy students set up a company in the legal form of a cooperative at the beginning of their studies and then learn by doing, i.e. developing the business of the company. They integrate their learning needs to support the development of the team and a sustainable company.

The **team** is the centre of the pedagogical studies and the learning process. Each team comprises 15 to 20 students. While during the first years of Proacademy all accepted applicants were included in one team only, the growing number of programme participants has made it necessary to split up the group into subgroups of currently four teams per year. The division into sub-groups is carried out in a way that ensures that each team is composed of **as diverse a group of people as possible**, as this has been found to be beneficial for learning in team settings.

Students are **financially responsible** for their own company. The annual turnover of a team company is approximately 120,000 euro. Revenues are used for example for salaries, events, seminars, and a graduation trip. After the team has graduated, the cooperative is usually turned into a limited company (Ltd.) by a sub-group of the graduating team. At any point in time, there are about 10 such team companies in operation.

At the start, students define their basic **business approach**: what kind of business they are going to do, their company's values, mission and goals and also the team rules. The company is the basis for a number of projects, which are jointly agreed upon and then executed.

The basic difference between the companies set up within the context of Proacademy and ordinary start-ups is that **making mistakes** is not really encouraged but certainly tolerated and seen as an important way to learn. As a consequence, many of the projects which Proacademy students embark upon fail, and productivity is very low. In those cases where Proacademy companies were continued after the team graduated, typically by a few of the graduates, today's company owners report of the challenges they faced when changing from the safe environment of Proacademy to a situation where they needed to turn a profit to be able to survive over the longer term.

Specific methods and media used

In addition to the real-world projects, studies consist of team meetings, small group workshops and coaching. There are no traditional lectures and exams: The learning process is to a large degree self-determined, supported by coaches. Students are allowed and encouraged to learn through their mistakes, failures and successes. On the team level, the most important tools of learning are dialogue, innovation and 'birth-giving' sessions and feedback discussions:

³⁴¹ See Leinonen et al. (2004).

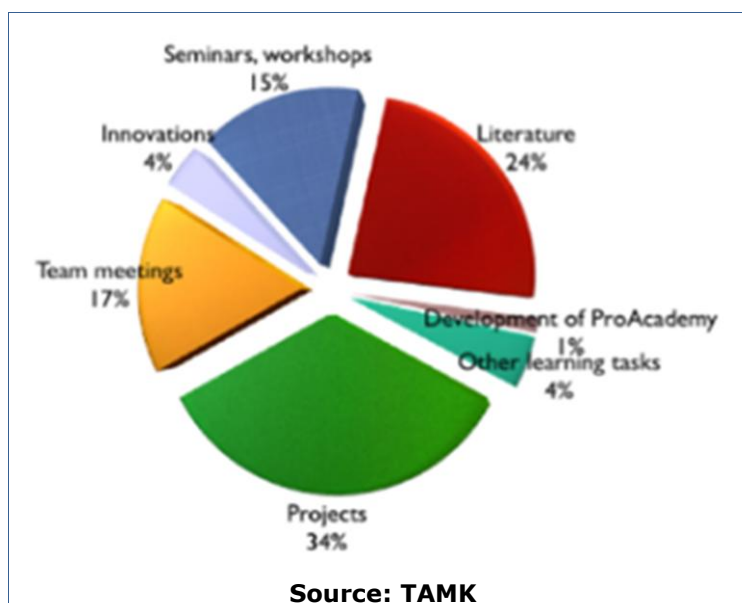
- The **projects**, of which there are about 50 per year in each Proacademy team, are the basic means for learning by doing and revolve around development of business in the team enterprise. Through the projects the team's knowledge is put into practise and new experiences and skills are created. The team learns and grows from project feedback. Usually students start business by doing small projects which do not require any or not much real money, before moving to bigger and more daring projects. Every team makes the decisions regarding what kind of structure they will have in their company. Such a project can be the development of a product or a marketing campaign. For example, one of the teams developed a business idea for renting out batteries for loading smartphones at summer festivals. This proved to be a very well chosen business model; the turnover generated in one summer was about 70,000 euro. A web campaign was developed as well (<http://powerit.fi/>). This is a good example for the type of activities thought up by Proacademy students, as it was innovative but also a lot of fun for all participating parties.
- **Team meetings** take place twice per week and last four hours. They represent the most important tool for reflecting on experiences, developing new ideas and sharing them. The purpose of the dialogue is to expand the thinking by coming up with new perspectives or alternative ideas and to deepen the understanding – instead of discussion where the goal is typically to make a decision and to narrow down the original set of ideas. The students organise these sessions in groups where each student has, for instance, to study a text, share key lessons learned with the team, and then translate it into activities that require the team to apply the knowledge in new contexts or analysing different cases. The coach supports the process as to ensure that key elements of a good dialogue are in place: careful listening, respect for all thoughts, waiting for others and talking openly and straightforwardly. All completed projects and many learning sessions are analysed with a dedicated tool that guides students to come to essential conclusions about the subject.
- **Literature and essays:** Self-learning is an important element of Proacademy education. Students need to collect so-called book points which requires them to study 60 – 70 books in 2.5 years, write essays about what they have learned, and discuss these with their coaches. There are no fixed reading lists, however: The scope of what kind of literature they should read is determined to some extent by the subject of the projects chosen by the team. Literature study is usually carried out in learning cells, i.e. group of teamsters join together to study and then discuss texts in line with shared interests.
- **Seminars** on topics of common interest, typically identified by the team: Teams choose from the TAMK portfolio of courses those which are of most relevance to them and then attend them.
- **24-hour innovation exam:** Two months before graduation each Proacademy team has to undergo this examination, which consists of developing a solution for a specific business challenge by a real-world business. The customer and project content are unknown until the start of the exam, after which students have 24 hours to complete the project and then present it in front of the customer. A grade (0 – 5) is assigned by the customer of the project, according to which she or he pays the project team per grade achieved. The 24h-exam is rehearsed before through 12h-exams (**innovation sessions**) following the same logic (but without money involved), which take place once a year.
- **Learning contracts:** Twice per year each student is asked to define her or his learning targets and to develop a learning portfolio in discussion with the coach. The coach makes recommendations in order to make sure that all study areas are covered. Each Proacademy team sets its own objectives as well in the form of a team agreement together with rules, procedures, goals and targets.

The Exhibit indicates the rough share of the various learning methods of the total time spent in the programme.

While Proacademy students do not have to take any

Exhibit 19-3: Approximate share of learning methods applied at Proacademy in%

exams apart from the team innovation exams, they need to write a final thesis as any other student at TAMK. The topic should be a combination of theoretical background and its application in practice.



Y-kampus applies a learning philosophy similar to Proacademy: learning by doing, learning in teams, learning through reflection, feedback and dialogues supported by coaches.

Informal evaluation of learning outcomes and feedback for students

Feedback discussions and dialogues supported by the coach are among the most important elements of the Proacademy concept of learning. They replace any formal evaluation through exams.

Formal evaluation of learning outcomes

Proacademy students do not have to take exams and do not receive grades – with the exception of the final thesis they have to write just as any other TAMK Bachelor/Master student. They can only either fail or pass. The extent of formal evaluation of learning outcomes is therefore much less than in traditional study programmes.

The drop-out rate is about 5 – 10%, i.e. one out of 10-20 students who start Proacademy drops out before the end of the programme. Most of these students return to traditional-type studies at TAMK: Proacademy students who realise that this is not for them have the option of changing back to traditional type learning at TAMK. For the time they spend at Proacademy, they will receive credits which means the risk is manageable.

19.2.4. Setting of entrepreneurship teaching

Locations

The **Proacademy** premises are not located on the central campus of TAMK but occupy one floor in a brownstone building in the Finlayson District in the centre of Tampere. The district was the centre of the textile factory in Tampere for 160 years, before work in the factory stopped in the 1980s and the area was converted into a location for museums, galleries, theatres as well as new media, ICT and art companies and campuses. This location offers Proacademy a very unconventional, fashionable environment very different to typical university campuses. It largely consists of open floor working spaces plus some partly separated, more office-like space in which coaches have their desks. To accommodate the increasing numbers of students, Proacademy moved across the street to another building in the same district in late 2014.

Y-kampus, which was set up in 2012 following a project development stage, has its own premises within the main TAMK campus. It consists of two workshop rooms with a capacity of 25 to 30 people, an open stage for 20 to 120 people, two meeting rooms for four to eight people, and various public working spaces. These settings fully reflect and support the learning methods applied in the courses offered by Y-kampus.

Timing

Proacademy students have only few activities with fixed schedules, such as the team meetings that take place twice per week, last for four hours and for which attendance is compulsory. For the largest part of the studies, timing is a question to be agreed upon by team members, with a lot of flexibility and a tendency to dissolution of traditional boundaries between study and leisure times.

19.2.5. Instructors: teachers and mentors

Professors, other employees and external lecturers of the university

Proacademy has coaches instead of typical academic staff such as professors and scientific assistants. Currently, Proacademy has five coaches, including the Head Coach, Mr. Veijo Hämäläinen, who is also the Head of Proacademy. He is reporting to the Director of Education, School of Business and Services. Hämäläinen started out as a math teacher before he joined Proacademy ten years ago. Back then he was searching for an alternative to traditional ways of teaching, as he felt lack of motivation and interest to be the biggest barrier to learning and creativity. He was spotted and contacted by Riitta-Liisa Arpiainen who, as Head of the Business Programme, was in charge of Proacademy at the time. Although he had doubts about his ability to act as a coach to entrepreneurship students at the Academy, she was convinced of his suitability for the task, which proved to be correct. A lot of his training in becoming a Proacademy coach took place jointly with his first team composed of 16 teamsters, where, in his own words, he learned more in 2.5 years than he had done during all his prior studies taken together.

The **Y-kampus** team comprises two coaches working full-time and seven teaching staff who contribute part of their working time. It is lead by Mikael Juntunen, who has been project manager throughout the development phase of the centre, i.e. he was in charge of developing the Y-kampus service and education concept in collaboration with his team. Juntunen did his studies, both Bachelor and Master degrees, at Proacademy, where he was among the first graduates. He is also engaged in an own family business (DigiMedia Finland Ltd), where he acts as Head of Sales and Area Manager. DigiMedia operates in three different cities in Finland and focuses on media sales in the field of consumer marketing. He is responsible for a range of business development projects in the company.

"Real entrepreneurs" as teachers

Coaches at Proacademy and Y-kampus do not include alumni now working in their own company, or entrepreneurs who have not studied at TAMK. Entrepreneurs with these backgrounds are, however, active as mentors. Moreover, Y-kampus project manager Mikael Juntunen has experience in business management in his own family company.

Mentors

The role of mentors is to help young entrepreneurs starting their business. Every Proacademy team is allocated two alumni to help. Currently Proacademy and Y-kampus have eight mentors from different fields of business:³⁴²

- Jarkko Haukijärvi has set up a multi-field company active in consulting, support services for sales, education, and cleaning services, employing about 70 people. He has supported more than 500 start-ups through hands-on advice and consultancy. In addition to his role as mentor, he returned to TAMK to do his MBA at Proacademy.
- Mikko Nurmi is one of the founders of webimprovements.com, a user experience evaluation service for websites and mobile applications. He works as the creative director and partner in Leadin, a design company founded in 2009 focusing on development of user experience.
- Kaisa Aare-Puff has founded a couple of health care businesses and worked as an entrepreneur for years. At the moment Kaisa is the managing director of Kototiimi and the chair of the board of SAP-Care Oy.

³⁴² See. <http://y-kampus.fi/en/mentors/>.

- Katri Lietsala is managing director and one of two founders of Gemilo Oy, which provides interactive online tools for learning, teaching and working sold to municipalities, companies, and public administration. Gemilo was listed as one of the most interesting Finnish start-ups 2010, and today employs ten persons.
- Pasi Rautio is founder and director of Oy TuloksenTuplausToimisto Ab, which provides consultancy focused on sales and marketing.
- Tanja Verho, Reetta Keränen, Anna Kulonen are the founders and directors of Kolmas Persoona Oy, a company specialised in development of service business and service innovations. At the moment their companies employ more than 30 persons.

Proacademy and Y-kampus mentors do not receive remuneration for their work. Many mentors have studied at Proacademy themselves, i.e. they are able to contribute both their experience from their studies at Proacademy and from starting and managing their own business.

19.2.6. Management of entrepreneurship education

Teacher and trainer management

For training the coaches, TAMK developed new approaches as well. These were again based on the models developed at Jyväskylä University for teaching in innovative learning environments. Such training is today provided by Y-kampus for all types of teaching staff, including from third party organisations. The coaching education consists of three topics which together form an introduction to coaching:

- Topic 1, "From teacher to coach": What does coaching mean in practice? How do teaching and coaching differ from one another? What are the possibilities of coaching? How does coaching suit teaching? Underlying theories and theorists including Marcial Losada, Kouzes & Posner, Nonaka & Takeuchi.
- Topic 2, "Coaching tools": What kind of tools and methods inspire students? How can entrepreneurial approaches be enhanced? What is the role of teams from the coach's viewpoint? What does team learning mean and what are the benefits of team learning? What kind of idea creation techniques can be applied and used in coaching? Underlying theories and theorists including William Isaacs, Ian Cunningham, Belbin.
- Topic 3, "Personal Coaching Philosophy": Model on coaching philosophy – what does it mean? How to build my coaching philosophy? What to introduce to everyday work and how? What will change in everyday work from now on? How to proceed in the work community? What did this journey offer to me?

At the time of writing, 50 teachers from inside of TAMK as well as third organisations participate in coaches' coaching programmes, a figure which has been growing each year.

In the case of **Proacademy** coaches, experience shows that despite of the in-depth training, coaches acquire most of their skills once they have started to work in the Proacademy environment. For members of the teaching staff who are used to work in traditional education environments, the first months at Proacademy are typically perceived as very challenging. A major reason is that Proacademy coaches need to practise a hands-off attitude, while being fully available for support. They are not meant to intervene proactively, only when students ask for advice. While traditional lecturers are able to keep a certain distance to their students, as a coach they are required to be totally devoted to the team, i.e. they have very little distance to their students. They also need to learn not to take things too personally. There were coaches who found working at Proacademy unsuitable for them, so they returned to traditional type teaching.

Managing student support

The courses, events and services offered by Y-kampus are the main vehicles for supporting students – and also teaching staff – who are considering starting an enterprise or engaging in any other start-up related activity.

The new visibility which entrepreneurship related support has gained due to the launch of Y-kampus and the marketing of its brand, together with the increased awareness of entrepreneurship as a career option for young people as reflected in its representation in the

media, have had a tangible effect on the interest shown in entrepreneurship courses, to the effect that demand for places in courses currently outstrips supply.

Internal and external network management

Y-kampus is the TAMK unit that is centrally responsible for networking with stakeholders within TAMK around issues related to EE.

Alumni tend to stay in close touch with the University. Most of them demonstrate that they are proud of their association with Proacademy, wishing to support their successors and the programme in general. An estimated 80% of alumni remain active at the Proacademy in one way or another after graduation.

Most interviewees agree that collaboration between the **four higher education institutes** in Pirkanmaa could be much stronger. One practical obstacle is competition over students and the financial resources that come with them.

One example of such co-operation related to EE is the common **Demola** unit, which serves all higher education students at Tampere. Demola is a programme for collaboration between students, universities and business partners. Thus it is a creative and real business activity, related to entrepreneurship. The Demola Network was launched in Tampere in 2008 but is today an international network. Demola participants work in a project with a multidisciplinary team to solve real-life cases together with partner companies. This training can be made part of students' degree programme at TAMK and the other universities in Tampere. The Tampere Demola unit carries about 100 projects per year, in which about 450 students are involved, 40% of which are from abroad.

In recent years, co-operation between the universities has been strengthened via ENTRE and the new working group on developing a unique model of higher education in Tampere. **ENTRE** is a joint initiative of TAMK, Tampere University of Technology (TUT) and University of Tampere (UTA) for allowing students to combine entrepreneurship related study modules from each of the three institutions. A business management student at TAMK, for example, may now enlist in courses provided by TUT and UTA and receive a degree certificate.³⁴³ The **working group on developing a unique model of higher education in Tampere** is preparing the establishment of a new, multidisciplinary higher education institution with an international presence.³⁴⁴ So far it is however not directly related to entrepreneurship education.

Proacademy is also in touch with **other polytechnics** in Finland and beyond in discussing innovation in EE, as the mood in the country and globally is shifting towards a much greater acceptance of and interest in entrepreneurship as well as towards innovative, more active ways of learning in (higher) education. TAMK has actively supported polytechnics in Turku, Lappenranta, Lapland Proacademy where programmes similar to Proacademy have been set up in the past three years.

Management of curricular integration and attracting new groups of students

Y-kampus is the TAMK unit that is centrally responsible for attracting new students to EE within TAMK. The design of the Y-kampus programme of activities was based on the experience with Proacademy as well as with entrepreneurship course programmes that have always been offered at TAMK, especially to students of business management. A survey was conducted of the Head of Degree Programmes (n = 30) plus Directors in order to explore perceived needs in the field of entrepreneurship education. In addition, students were surveyed as well. Y-kampus is engaged in three basic types of activities which also serve curricular integration:

- One or two entrepreneurship-centred **events and happenings** per month, which are a sort of marketing device for increasing awareness among faculty members and students of Y-kampus and entrepreneurship more generally. The number of individuals participating in events is approximately 1,100 per year.

³⁴³ The main modules available are: Business Camp (5 credits, TPU), From Idea to Company (5 credits, TAMK), Growth Entrepreneurship (5 credits, TAMK), Business Plan (4 credits, TTY), Technology Commercialisation (4 credits, TTY), Creation of New Knowledge and its Tools (4 credits, TTY), Business Law (5 credits, UTA), Strategy and Entrepreneurship (5 credits, UTA), Business Models (5 credits, UTA).

³⁴⁴ See <http://www.tut.fi/en/about-tut/news-and-events/unique-model-of-higher-education-developed-in-tampere-p078221c2>, accessed 2014/11/16, 18:00.

- Nine different **course programmes** (see section 19.2.1), serving beginners as well as advanced students and lasting between three and six months. These courses are for students from the whole University, who are eligible for receiving credit points from Y-kampus programmes. The number of individuals enrolled in courses is 150 per year.
- **Mentoring and coaching** of nascent (student) entrepreneurs. These are supported in the process of developing their start-up ideas further, or, if they have an up-and-running business already, to boost their competitiveness. Students can obtain credits from mentoring sessions as well. Number of individuals in mentoring and coaching sessions: 30 per year.

The Y-kampus management seeks to increase, in particular, the number of persons who make use of its entrepreneurship mentoring and **coaching services**. This will require stepping up collaboration with relevant external stakeholders in the region, including the other universities and public service providers. The plan is for Y-kampus to take a stronger role in entrepreneurship education in the Tampere region at large.

Y-kampus is professionally marketed through social media and partnerships with traditional media. Marketing campaigns focus on provocative messages as a means to build the brand but also to present entrepreneurship to students as something "cool".

Evaluation of courses and programmes

Evaluation of the Proacademy programme and Y-kampus courses is part of **TAMK's quality, assessment and feedback system**. The system includes course feedback through TAMK's intranet, Annual Student Feedback through a questionnaire, Student Notification of Educational Defects, Supervision and Development Discussions, a student feedback collection system of universities of applied sciences and the Ministry of Education and Culture named OPALA, and TAMK's Quality Management System.

See the annex of this case study for a detailed description of this system.

A scientific evaluation of the impact of the **Proacademy** programme is taking place at the time of writing this case study, in the context of a PhD study. For this, 18 students who entered Proacademy were followed through the two and half year course. Three of them dropped out, mainly because of different personal reasons. Also 13 students of Namibia's ProLearning study programme's first team were followed through their two years study programme and also three years after graduation.

A dedicated evaluation of **Y-kampus** has not yet taken place; the methodology is still being developed. The main criterion for assessing success at this early stage is the number of participants in events, courses as well as mentoring and coaching. In the future, an increasing emphasis will be placed on attracting participants from outside of TAMK.

19.3. Extra-curricular activities related to entrepreneurship education

Y-kampus is engaged in some extra-curricular activities, but as these are limited to provision of mentoring and coaching of non-student individuals (not yet practised very much) and awareness-raising events (the main goal of which is attracting students to enrol in Y-kampus courses), they will not be further discussed here.

Y-kampus offers mentoring and coaching also in extra-curricular form, i.e. to students or staff members who would like to obtain advice in start-up related issues. For this purpose, Y-kampus collaborates with local and regional public services responsible for start-up support including the Chamber of Commerce and the Pirkanmaa Entrepreneurs' Association.

19.4. Institutional aspects of entrepreneurship education

19.4.1. Organisational set-up and change

When Proacademy was founded in 1999, it belonged under the Head of Business programme until 2010. Since then the Head of Proacademy has reported to the Director of Education, School of Business and Services.

When Y-kampus was founded in 2012, a totally new organisational unit was set up, which is now in charge of EE with the exception of Proacademy.

There are no specific positions for EE in the university's management, e.g. "Vice-Chancellor for Entrepreneurship, Vice-Rector for Entrepreneurship Education or similar.

19.4.2. Laws, statutes and codes

TAMK does not offer explicit **incentives for staff** to engage in or support EE. However, recent years have witnessed a sharp increase in awareness about the need for stronger entrepreneurship in Finland in general and in the Tampere region in particular. This has led to more and more teaching staff to develop an interest in EE.

Y-kampus offers a range of coach training courses, which are voluntary but open to all teaching staff at TAMK. Such training had been available already before the launch of Y-kampus in 2012, but has been streamlined and harmonised under the newly established roof of Y-kampus. Demand has grown significantly in recent years and currently there are more applications than course places available. Since the start of Y-kampus, about 100 teachers have undergone three-month coach training, which is part of their work schedule, i.e. not leisure time.

There are no plans to make coach training mandatory, since the concept requires participants to be self-motivated.

There are no specific **incentives for other stakeholders** to contribute to EE at TAMK.

19.4.3. Mindsets and attitudes

Raising awareness for the importance of entrepreneurship

When Proacademy was founded in 1999 it was a totally new way of learning, and also learning entrepreneurship was not common at that time. There was **resistance** in those days towards this kind of learning among the personnel; it was not well understood and accepted. Many years of positive experience, however, have resulted in Proacademy and the team learning approach at TAMK being supported and understood very well by the University management and by teaching staff.

In the early years, Proacademy was understood as a **laboratory for experimenting** with innovative ways of education focusing on entrepreneurship. The intention was to establish a space in which staff and students were expected to think outside of the rules operating in traditional types of higher education programmes. For example, the role of teaching staff is radically different at Proacademy compared to the rest of TAMK, as they are required to take a hands-off, reactive role and to encourage experimentation at the risk of failure.

There has been an intensive discussion at TAMK about the question whether to allow students from other course programmes to enrol in Proacademy. In 2014, the first students of **Nursing & Health Care and Tourism** started at Proacademy. It appears that the process of extending Proacademy to further study courses is advancing slowly. The biggest practical obstacle appears to be that course programme syllabuses are very strict and tight, i.e. adaptation to the Proacademy approach is difficult.

In order to establish entrepreneurship education more firmly in other course programmes as well, the Y-kampus has been implemented in 2012. Through the visibility of Y-kampus, awareness about related education offers has become much stronger, and interest in participating in Y-kampus courses and events is very strong. There is now a broad consensus at TAMK that, while Proacademy is not a way of learning suited for everybody, entrepreneurship education offers should be open to everybody.

Encouraging entrepreneurial behaviour

Encouraging entrepreneurial behaviour is at the heart of TAMK's approach to EE. **Proacademy** students learn by working as team entrepreneurs for 2.5 years. They also set up their own learning targets, individually and for the whole team and supported wherever needed by their coach, and lay them down in the form of a learning contract.

Y-kampus is using the similar kind learning philosophy like Proacademy, learning by doing in teams with the same learning tools. It seeks to create an entrepreneurial mindset among all the students and teachers of TAMK, to which end it offers entrepreneurship courses and happenings to all students at TAMK as well as from the other two universities in Tampere.

In the **Business Study** Programme, all first-year students, typically around 160, spend much of their basic business studies working in "virtual companies", using a Business Learning Environment developed for this purpose (Kykylaakso³⁴⁵). Kykylaakso allows learners to set up fictional enterprises and have them operate just as normal enterprises do – except for the fact that the money traded and the goods produced are not real. Each Learning Enterprise is operated by a group of ten students.

In terms of general attitudes to entrepreneurship, the interviews conducted for this case study indicate that the Finnish education system is seen as very good in educating individuals with one or two key competencies, but not so good in supplying graduates with the skills for collaboration, teamwork and work in diverse and multi-cultural contexts. It is exactly these shortcomings which Proacademy and Y-kampus are addressing.

Moreover, it appears that in Finland there is still a widely held opinion that you need to be born as an entrepreneur, i.e. you cannot learn to become one. The experience from Proacademy appears to contradict this statement. A number of Proacademy graduates and current students, interviewed for the present study, stated that they had never thought of themselves as being suitable for becoming an entrepreneur, but had become convinced of the contrary.

There are clear indications for growing interest among young people in Finland for entrepreneurship, as is reflected in sharply increasing figures of people who show up at entrepreneurship events and happenings. This represents a considerable change in attitudes among the people of Finland. Many parents of ProAcademians are still sceptical of the approach, as they tend to think a life-time job with a big employer is the thing to aim for. But such jobs are disappearing quickly in the country, especially since the collapse of the Nokia ecosystem.

It is against this background that Proacademy's vision is to be "a nationally and internationally recognised school for entrepreneurs". It enjoys the full support of the President and Vice-President of TAMK in achieving this aim. The university's top management has for a long time already encouraged experimentation and innovation related to entrepreneurship education.

19.5. Outreach to external stakeholders

19.5.1. Types of relationships with external stakeholders

The region's economy is undergoing a painful process of structural change, which has led to job losses especially in larger companies, leading to high rates of unemployment. This has severe repercussions on the demands on higher education. For example, before the decline set in, Nokia hired almost everybody who graduated from the Tampere Technical University, which meant that curricula were aligned with the needs of Nokia. This has changed radically over recent years because of the downsizing of Nokia's operations in the region. Apart from these structural problems which are similar in most of Finland today, the Tampere region is benefitting from strong growth in population and an inflow of, in particular, young people, who prefer Tampere to Helsinki because it is less crowded, less expensive but still offering a very high quality of life.

Against this background, TAMK is engaged in co-operation with the **other two higher education institutions** in Tampere to identify and exploit synergies and to market the region as a national and global centre for innovation.

³⁴⁵ See <http://www.kykylaakso.fi/palvelut/Index.php>.

TAMK has close relationships to **larger companies** in the region as well as to the representatives of **smaller businesses**.

Proacademy enjoys a very good relationship with **local media**, i.e. newspapers, radio and TV stations. One third of TAMK's media points are generated by reports about Proacademy.

19.5.2. External stakeholders involved in entrepreneurship education

Enterprises

Associations of enterprises as well as individual larger employers are represented in the decision-making about EE at the university through TAMK's Board. TAMK also organises business evenings for discussing the business sector's requirements on higher education with companies in the region. The Finnish polytechnics, however, have traditionally been co-operating most closely with larger corporations, while relationships with SMEs tend to be underdeveloped. Since large companies have lost much of their lure as employers in the Tampere region and smaller companies do not have the same kind of tradition in co-operating with the higher education sector, this legacy acts as a barrier to closer ties with the business community, as Jari Jokilampi, CEO of Pirkanmaa Entrepreneurs' Association, points out.

A major challenge for reaching out to more small businesses seeking innovation is marketing and communication. How can the services of Proacademy and Y-kampus be communicated effectively to the target audiences, which consist of thousands of start-ups and small, growth-hungry companies in the region? The case study found this to appear to be a challenge left to be addressed.

Financial institutions

There are no specific relationships with financial institutions in the context of Proacademy and Y-kampus.

Support services

There is a range of public service providers supporting nascent entrepreneurs in the Tampere region. The two most important may be the Chamber of Commerce and the Pirkanmaa Entrepreneurs' Association.

The region's **Chambers of Commerce** represents 1,700 member companies in the wider Tampere region. The Chamber of Commerce organises a number of committees, including the education committee and the industrial committee, in which business requirements for new or revised curricula are being discussed. The Chamber provides TAMK with representatives from the business community who are well-positioned to help with the practical matters of such changes.

Pirkanmaa Entrepreneurs' Association has a 20 year track record in advising and supporting start-ups in the region. It has supported 10,000 entrepreneurs in the process. The Association provides advisory services especially to start-up as well as training courses and seminars. The Association states to be very pleased with the student output from Proacademy and with the general emphasis on entrepreneurship at TAMK. It was however mentioned that there is far too little co-operation between existing, small companies in the region and the universities. Much creativity would be needed to address this shortcoming, as small companies tend to consider further education and training as a luxury rather than a necessity.

Incubators, accelerators, science parks and technology parks

TAMK's degree programmes in Media and Arts will move its location to **Mediapolis**, an international science and technology park plus campus. Mediapolis concentrates on content production and ICT and brings together companies and students to work side-by-side in a fruitful environment for entrepreneurial thinking. The move will go ahead in late 2014.

19.5.3. International relationships

The Proacademy model has been transferred to other polytechnics around the world, such as in **Namibia**: Here, TAMK participated in setting up ProLearning, a study program similar to

Proacademy's and run at the Polytechnic of Namibia in close cooperation and mentorship of TAMK's Riitta-Liisa Arpiainen. This connection came about through existing personal connections. A similar partnership was established with **Bristol** University in England, where a programme based on the Proacademy approach started in 2014. Interest in team-based entrepreneurship education in the UK was said to have grown a lot in recent years.

Education itself also has a **strongly international element**. Each year Proacademy organises and participates in at least two international summer schools, where students get together in multicultural and interdisciplinary teams to develop innovative solutions for customer cases. Every spring Proacademy hosts a business development and innovation module for exchange students regardless of their field of study.

The interest in the Proacademy approach is reflected in **large numbers of visitors** to the campus. In 2013 TAMK welcomed about 1,000 visitors from 16 countries from all over the world to Proacademy.

19.6. Impact and lessons learned

19.6.1. Evaluating impacts of the entrepreneurship education approach

Overview of impact evaluation methods applied

A formal impact evaluation of **Proacademy** has not yet taken place. An informal evaluation may be based on the following soft indicators:

- 20% of graduates from Proacademy take up (and finish) a masters study programme afterwards, which is an indication that Proacademy does provide students with the necessary level of competence in spite of its non-traditional methods and focus on self-determined and team learning.
- Feedback received from current and former Proacademy students is very good to enthusiastic. The impression is that participants feel their potential has been unleashed by the methods applied in the programme, whereas it would have remained dormant in traditional educational settings.
- About four out of five Proacademy alumni stay in close touch with the university after graduation, contributing to the programme and their successors through mentoring, presentations and other forms of support.
- 20 – 25% of Proacademy participants start a company in the years following graduation – compared to a figure of less than 5% for all university graduates in Finland.
- The total turnover of a student company is approximately 120,000 euro per year, without teams having received any start capital when launching the company. This demonstrates the degree to which the learning environment at Proacademy is embedded in the real world of business from a very early stage in the 2.5 years programme onwards.
- Interviewees with an insider-view of the job market in the Tampere region confirm that graduation from Proacademy is considered an excellent component of a job applicant's CV.
- Almost all of the companies that were established in the course of a Proacademy course are later continued in one or the other way by a subgroup of the class.

Impact evaluation methods and findings

A scientific evaluation of the impact of the Proacademy programme is taking place at the time of writing in the context of a PhD study. For this, 18 students who entered Proacademy were followed through the two and half year course. Three of them dropped out, mainly because of different personal reasons. Also 13 students of Namibia's ProLearning study programme's first team were followed through their two years study programme and also three years after graduation.

Number of start-ups

A further performance measure being considered to be introduced is the number of start-ups created by graduates from TAMK. This indicator has not yet been defined, and the methodology for measurement would need to be developed – for example, within how many years after

graduation? The main objective of the work of Y-kampus is to make entrepreneurship a viable career option for as many students as possible, but Y-kampus does not seek that every graduate should engage in a business start-up. Y-kampus leaders believe that entrepreneurship skills are also increasingly relevant within larger organisations, not merely for starting your own company.

19.6.2. Lessons learned

Summary of lessons learned about methods and settings

Proacademy, an EE programme where all coaching, learning and business development activities are focused on facilitating the entrepreneurial path, was found to be successful in generating creativity and preparing participants for entrepreneurial behaviour during their working life. Proacademy represents a unique (and to many daring) approach to continuous development of a learning community, based on team learning and self-managed development of relevant knowledge and skills. The shared decision making in Proacademy allows for student-entrepreneurs taking an active and responsible role in the management of the study programme and leaves enough room for creativity and innovation in practice. Capability of self-leadership of teams and individuals is enabled by a shared vision and values, and the shared domain of entrepreneurship as the focus of learning activities.³⁴⁶ The main lessons learned from the Proacademy case in terms of the methods and setting of EE include the following:

- **Feasibility of company establishment:** Letting students establish a company and take the full financial risk for it has proven to be fully feasible. There has as yet been no case in which the university needed to step in to prevent damage from Proacademy students.
- **Benefits of immediate encounter with customers:** Approaches where the university decides to supply students with initial capital for setting up their own business, may make the programme more expensive to run and may also compromise the learning process: If newly established companies are supplied with seed capital, students will feel less urgency to gain customers and generate turnover. At Proacademy, in contrast, students have their first meeting with potential customers in the first week after establishing their company. While it takes a lot of courage for fresh Proacademy "teamsters" to make cold calls to potential customers, this proves to be a necessary part of the studies. In addition, many companies in the wider region by now know about Proacademy, i.e. they kind of expect to receive such calls. Some companies have even started to reserve certain kinds of projects for future Proacademy teams.
- **Feasibility of learning to become an entrepreneur:** In Finland many people still believe that you need to be born as an entrepreneur to launch a business, i.e. one cannot not learn to become an entrepreneur. The experience from Proacademy appears to contradict this assumption. Many Proacademy graduates and current students state that they had never thought of themselves as being suitable for becoming an entrepreneur, but had become convinced of the contrary.
- **Selecting candidates who can withstand pressure:** This conviction is reflected in the selection process for Proacademy. Applicants are interviewed in some depth, but not so much to explore whether they are "born entrepreneurs", but rather to assess whether they are likely to withstand the considerable work and time pressure typical for Proacademy projects.
- **Applicability in different academic disciplines:** The Proacademy approach may not only be suitable for students of business administration, but for other study programmes as well. At TAMK, the first Proacademy teams of students of Transport and Nursing & Health Care, respectively, have commenced in 2014.
- **Choosing a fashionable location rather than being on campus:** The Proacademy campus is not located on the main TAMK campus but resides in a brownstone building in an early-industrialised part of the city which has been converted into a fashionable centre of young, high growth companies, museums, theatres, and coffee shops. This has contributed to the feeling of Proacademy as being well-embedded in the real-world entrepreneurship

³⁴⁶ cf Nevalainen & Maijala (2012)

landscape rather than being an academic institution at arm's length from the business world.

- **No grades necessary:** Proacademy students do not receive grades, with the exception of their Bachelor thesis. Anecdotal evidence suggests this suits potential employers in the business sector well, as they tend to be interested in grades only insofar as they relate to performance in practical matters, but not much in grades for how well people can learn by rote.

Preconditions for establishing a radically different type of EE

Proacademy was founded in 1999 as a **laboratory for experimenting** with innovative ways of education focusing on entrepreneurship – at a time when EE was still far from being considered essential in Finland. It was a space in which TAMK could experiment with innovative pedagogical approaches, without any direct impact on the remaining, traditional course programmes run at the university. Proacademy has always understood itself as a learning organisation itself, i.e. the experience over the years has led to many incremental changes and adaptations to increase the effectiveness of the programme.

With the benefit of hindsight, this strategy has proven very beneficial, as ten years later, when EE had become all the rage in Finland, TAMK was able to offer a well-established, highly advanced EE programme to the growing numbers of students seeking a more practically oriented pathway to a Bachelor in Business Administration.

Mainstreaming EE across the university

Mainstreaming of EE across all parts of the university, as attempted by TAMK's launch of Y-kampus in 2012, involves the following issues:

- **Importance of staff training:** Changing cultural attitudes to entrepreneurship within a higher education institution can only succeed when staff training receives utmost attention. It will not be possible, however, to obtain buy-in from each and every member of the teaching staff. At TAMK some of the older teachers still believe that it is very risky to start a new business. They consider it irresponsible to encourage students to become an entrepreneur, as teamsters are too young. Feedback from former Proacademy students, however, suggests this might not be true.
- **Efforts to bridge different staff opinions:** Experience from TAMK indicates that internal promotion of the Y-kampus and Proacademy approaches did not yet reach all members of the teaching staff, as there is still some resistance especially from older personnel. Quite a few members of the teaching staff still rely totally on traditional ways of teaching, which appear to lose relevance in sight of today's labour markets. Bridging the cultural gap between older and younger teachers will require continued efforts.
- **Teachers' practical experience:** One idea discussed during the interviews conducted for the present study was to ask every member of the teaching staff that they must have worked in the management of a real company for some time; this may increase awareness about the needs of EE a lot.

Marketing to new types of students and stakeholders

In terms of marketing Proacademy and Y-kampus to new types of audiences, in particular existing start-ups and growth-oriented small enterprises, the following lessons can be mentioned:

- **Untapped target groups:** It might be necessary to step up marketing efforts to reach new groups of potential students, such as owners of young businesses struggling with achieving self-sustaining growth. It appears that many potential clients do not yet realise the benefits of enrolling in Proacademy. This is likely to apply to practice-oriented EE offers in other parts of the world as well.
- **Courses for absolute beginners:** It could make sense to consider offering different course programmes for (a) total beginners, i.e. students without any experience in managing a business, and (b) participants who have experience as business owner or part of a family business. This would not mean that both groups should be separated completely, but that some elements of specialisation are introduced into the curriculum. Our interviews indicate that this could increase the effectiveness of the programme

particularly for the second group, i.e. students who already have experience as business owner or part of a family business

- **Motivating entrepreneurs beyond alumni:** It appears that it is difficult to motivate successful entrepreneurs to act as mentor or even coach at the Proacademy – if they are not Proacademy alumni themselves. Attracting this group would widen the pool of expertise the programme could exploit for offering hands-on mentoring. This is an area which could be professionalised, possibly by offering some kind of compensation to mentors.
- **Regional university co-operation:** Cooperation between the three higher education institutions in Tampere has received a boost in recent years, but there still appears a lot to be done in order to identify and exploit synergies, i.e. to eliminate duplication and to market EE in higher education as effectively as possible to the diverse range of target audiences.

Improving the regional business environment

With regard to the overall **conditions for starting a business** in Pirkanmaa, the TAMK experience shows that more needs to be done in terms of a tighter support net for nascent entrepreneurs in the region. While there are many service providers that offer a range of supports to start-ups, collaboration between these may need to be stepped up so that entrepreneurs receive effective, hands-on support across all stages of the start-up process.

Transferability to other universities

Since the Team Academy (Tiimiakatemia) approach was invented at the University of Jyväskylä in 1993, it has been transferred and successfully established at a considerable number of higher education institutions across the globe. An overview document compiled by Nina Jussila³⁴⁷ lists universities from ten countries, which together account for more than 10,000 students who have been, or are being trained, using team-based approaches based on Johannes Partanen's original concept. Jussila states that there are over 1,300 team entrepreneurs and over 800 trained team coaches already.

The persons responsible for operation of the Proacademy programme at TAMK advise other universities which would like to experiment with the team entrepreneurship approach to jump into the water and in one go set up a full-scale programme rather than merely adding more practical work to traditional course programmes. Experience so far indicates that many universities lack the courage to do so, but it is necessary to gain the full benefits from the Proacademy approach. The team learning and team education approach is very specific, even radical, and different from traditional approaches. It may require highly innovative management and teachers.

In general, entrepreneurship education programmes in which students have to launch real companies may have become much easier to realise because of the new possibilities to do business in the digital domain: It is today possible to develop and offer innovative kinds of services via the Internet which require very little investment, i.e. where barriers to market entry are extremely low, as Head of the Proacademy Veijo Hämäläinen pointed out.

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Annex

TAMK's quality, assessment and feedback system

Feedback on studies as part of TAMK's quality, assessment and feedback system

Student feedback forms an important part of TAMK's quality, assessment and feedback system. Course feedback is a means for giving feedback on course implementations directly to the teacher in charge. Student feedback is discussed annually in the performance analysis of degree programmes. Thus, it is a significant channel in affecting the development of teaching and curricula. This also applies to EE.

Course Feedback: After each course, it is possible to give feedback through the electronic feedback system in TAMK's intranet or by using another method defined by the teacher. Intranet identifications are used to log into the feedback system, logging in enables the system to recognise the student's courses. The identity of the feedback giver cannot be seen in the answers. Summary of course feedback is saved in the course implementation plan.

Annual Student Feedback: First-year students give feedback on matters related to the beginning of the studies through the Questionnaire for First-Year Students. The questionnaire is sent to students in the autumn (and in the spring for those whose studies have begun in January). Annual feedback on studying is collected with an online form. Tutor teachers discuss the feedback with their own groups after which the feedback is processed at the level of the degree programme with the teachers, head of degree programme, and representatives elected by diverse groups, and the potential changes made based on the feedback are told. The survey aims at collecting extensive OPALA-like feedback on the study process of degree-awarding education during the whole study time. The survey is sent to students at the end of the autumn term. Annual feedback is collected from all students except for the first-year students (they have answered the Questionnaire for First-Year Students). As regards master's degree students, the survey is sent to all except for those who have started their studies in the autumn in question.

Student Notification of Educational Defects: When the student wants to complain about teaching, (s)he first discusses the matter (1) with the rest of the group and then, if the group has a joint opinion on the notification, (2) with the teacher concerned.

If the above-mentioned discussions do not bring the desired result: (3) The group and the teacher discuss with one another on a separately agreed occasion. The purpose of the discussion is always to reach a compromise. (4) If the oral conciliation does not bring the desired result, the group makes a written notification of the matter. The notification is signed by all or some of the group members. The notification can also be signed with a marking of how many group members stand behind the notification. The notification is delivered to the head of degree programme, and it also has to include the information on when the conciliation discussion has taken place. (5) The head of degree programme has to convene the group for conciliation in a month after the complaint has arrived. In addition to the head of degree programme, the group members and the teacher attend this conciliation. The head of degree programme presides at the conciliation. (6) If this conciliation does not bring the desired result, the head of degree programme delivers the discussion memo and the notification to the director of education who makes the decision as required by the situation, if need be together with the vice president in charge of education. (7) The head of degree programme informs those who have signed the notification of the related decision. If the student does not know how to complain about an educational defect, the head of degree programme, director of education etc. will tell the appropriate complaint manner to the student.

Supervision and Development Discussions: The teacher tutor has a personal supervision and development discussion with the students a minimum of once a year and makes a summary of it for the student counsellor, who delivers the overall analysis of the degree programme to the head of degree programme and student counselling coordinator. The summary is discussed in a degree programme meeting together with other student feedback when making the performance analysis and deciding the development targets for the following year.

OPALA: OPALA is a common and uniform student feedback collection system of universities of applied sciences and the Ministry of Education and Culture. All graduating students fill in it during their graduation month. OPALA feedback maps experiences of the whole study time.

TAMK's Quality Management System: TAMK's core processes are education, research and development. They are supported by internal services. The core of quality management is formed by immediate evaluation in learning situations with the aim of ensuring the validity and achievement of the set learning and competence objectives. Another significant dimension is formed by quality assurance in teaching and related curricula. TAMK's key task is to support development of expertise both in degree-awarding education and in research, development and business services. Evaluation data is collected from several sources, such as student database Winha, statistical data collected for the Ministry of Education and Culture, questionnaires made for students and staff and AMKOTA files, a university of applied sciences decision and statistical database maintained by the Ministry of Education and Culture. The evaluation data is brought together in performance analysis of the schools and units in the spring. Analysis of information takes place in the degree programmes. The analysed information creates the basis for target setting for the following period. TAMK's quality manual is a key tool in the everyday work of the higher education institution. It contains the detailed study-related instructions, responsibilities and forms.

Source: <http://ects-guide.tamk.fi/palautteen-antaminen-opinnoista>, downloaded 2014/11/30.

20. University of Valencia, Spain: The Business Culture Chair and entrepreneurship training for university lecturers

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Abstract



The main hub for entrepreneurship education (EE) at the University of Valencia (UV) is the externally settled Business Culture Chair (BCC) which is part of the University-Business Foundation ADEIT. Although ADEIT and the BCC do not currently provide curricular offers in EE, it has a remarkable influence on the teaching style across the whole university. The main activity is an annual one-week Valencian Professors Summer School (VPSS) based on the train-the-trainer principle. The concept aims at sensitising and teaching entrepreneurship to the universities' lecturers. The focus is on how to discover and promote the entrepreneurial spirit and mindset among their students. Thanks to the interdisciplinary participants the concept can be spread out and implemented in the whole university. The main lesson learned is to inspire the participants as to how to establish a teaching style that promotes entrepreneurship in the classroom instead of teaching actual business knowledge. Evaluation is provided through the business idea competition MOTIVEM where student teams, which are mentored by former VPSS participants, develop their own business ideas. To reinforce the impact of the VPSS, lecturers from different Spanish and international universities are encouraged to participate in order to implement the VPSS idea in their own university environment.

Case study fact sheet

▪ Full name of the university and location:	University of Valencia, Valencia, Spain
▪ Legal status (e.g. public or private)	Public
▪ Location (if applicable: branches):	3 university campuses (Blasco Ibáñez, Burjassot-Paterna and Tarongers)
▪ Year of foundation:	University: 1499, Business Culture Chair: 1999
▪ Number of students:	Approx. 46,000 undergraduates and 12,500 postgraduates
▪ Number of employees (broken down by teaching, research and administrative staff):	Approx. 3,300 professors, lectures and researchers, over 1,700 administration and service staff.
▪ Budget in most recent financial year:	2014: 319.6 million euro
▪ Academic profile:	UV hosts 18 distinct faculties/schools: Engineering; Biological Sciences; Chemistry; Economics; Geography and History; Law; Mathematics; Medicine and Odontology; Nursing and Chiropody; Language Studies, Translation and Communication; Pharmacy; Philosophy and Educational Sciences; Physical Activity and Sport Sciences; Psychology; Physics; Physiotherapy; Social Sciences; Teacher Training
▪ Entrepreneurial profile:	Besides the curricular offers by the Faculty of Economics (extra-curricular) entrepreneurial education is mainly provided by the Business Culture Chair as a centralised organisation providing all faculties with several "not-for-credit" offers
▪ Activities focused in this case study:	Activities of the Business Culture Chair, an institutional chair administered by the University- Business

	<i>Foundation of the University of Valencia (ADEIT). The focus of this case is on the offered annual one-week Professor Summer School.</i>
▪ <i>Case contact person(s):</i>	<i>Antonio Aracil (ADEIT; University of Valencia)</i>

Information included in this case study is from April 2015 unless stated differently.

20.1. The university’s entrepreneurial profile

20.1.1. The university’s overall approach to entrepreneurship education

UV is the largest among the universities of the Region of Valencia and follows a concentrated approach towards EE. To narrow the gap between university (activities) and the companies (world), the University-Business Foundation ADEIT of the University of Valencia (founded in 1989) has built the “Cátedra de Cultura Empresarial” (BCC, Business Culture Chair; <http://www.adeituv.es/en/emprendedores/>). The BCC grew out of the Board of Trustees of ADEIT in 1999 as a result of the need expressed by recognised entrepreneurs in the Valencian community to promote entrepreneurship and spread entrepreneurial spirit amongst university students. This aim, in recent years, has gone from being just an optional strategic line for universities, to now being obligatory. It is the responsibility of public universities to awaken the entrepreneurial spirit in young university students, thus encouraging the creation of new businesses. The BCC is a comprehensive and innovative programme that promotes entrepreneurship and the creation of new businesses that originate from within the university environment. Moreover, the concept has opened an important communication channel between the business world and society through university knowledge. On one hand, the Chair has allowed the region’s main successful businessmen, who until recently had nothing to do with the UV, to enter the university fold. On the other hand, students of the UV are trained in business values, such as assessing risk, being awake to opportunities and evaluating success and failure – and it has been the case since 1999 when this knowledge and skill set were not part of the official curriculum (not since the Bologna process). The key to the Chair’s success is based on the close cooperation between the stakeholders: the university, businesses, and government.

The outstanding aspect of this case is the yearly one-week VPSS which is addressed to university professors from any area of knowledge who want to promote entrepreneurship between university students, particularly those who are not related to the area of business management.

The programme’s aim is to provide participants with knowledge and unorthodox techniques using games, creativity and cognition exercises. The goal is to create ambassadors for entrepreneurship spirit so the participants can foster their own students in the classroom by individually establishing and implementing an entrepreneurial teaching style. As a result, the professors may judge whether a student is more likely to become an entrepreneur and can further encourage him or her e.g., in participating in further programmes of the BCC. The essential success point is that there is no specific orientation required. No matter which field of studies, an implementation is always realisable since it does not ask for business knowledge or experience.

Proposed by BCC, the programme was promoted by the regional and the state government. Due to its success, it expanded to other parts of Spain so that professors from different universities could also participate and build something similar at their universities.

20.1.2. Leadership and governance

Importance of government strategies

On a regional level, Law 2 /2012 of 14 June of the Valencian government on *Urgent Measures to Support Businesses and Entrepreneurs, Micro, Small and Medium Enterprises in the Valencian community*, develops a series of initiatives designed specifically to revitalise and support the manufacturing sector and to encourage the generation of new economic activity that will create employment in the Valencian community. One of its main pillars is the fostering of support, information, coordination and funding measures aimed at entrepreneurs.

One of the main objectives of Law 14/2013 of 27 September, on *Support for Entrepreneurs and Internationalisation* is to encourage entrepreneurship in the educational environment, incorporating specific objectives to promote this initiative as well as entrepreneurial skills. Consequently through this law, more activities to bring the university closer to entrepreneurial culture will be organised, and it will ensure that lecturers possess the necessary training in entrepreneurship.

The Region of Valencia and the country have considerable interest in promoting entrepreneurship at the university level. With respect to the UV, the BCC came up with the idea of a VPSS and it was therefore proposed to the university. The university then approached the regional government. In 2009 VPSS started for the first time. The Valencian state supported the programme with 60,000€ from 2013 to 2014. After each VPSS edition, an evaluation takes place to decide whether to continue the financial support or not. In 2012, the *Spanish Network for the Promotion of Entrepreneurship amongst University Students* (RE4) network started in collaboration with the universities of Cordoba, La Laguna and Valladolid. Because of its success it was extended to the universities of Basque Country (2013), Las Palmas, A Coruña and Zaragoza (2014). The BCC offers knowledge and method transfer to other universities in Spain so that they can also implement and run a Summer School themselves. The national government paid a total amount of 25,200€ to the 3 universities so that they can participate in the programme. In 2014 the Valencian government extended the VPSS system to build up the REcv5 network with the other 4 Valencian universities.

The connected business idea competition MOTIVEM (see section 1.3.3 Informal assessment of learning outcomes and feedback for students), which is unique nationally, is also supported by the Valencian government.

Importance of entrepreneurship in the university's strategy

The strategic plan 2012-2015 contains several strategies with specific aims. One of the strategic objectives of the Plan 2012-2015 of the University of Valencia is to foster critical thinking, creativity, innovation and entrepreneurship:

- Programme for raising awareness of the university community on the function of entrepreneurship.
- Plan for supporting former graduates and PhDs to transfer their research knowledge and results into entrepreneurial business ideas.
- Plan for the promotion of the entrepreneurship in the classroom through a train-the-trainer concept within the professorship of the university (VPSS)

Extent of high level commitment to implementing entrepreneurship

It is difficult to implement an entrepreneurial strategy at UV. The European Union (EU) may stimulate EE at university level. Until now the focus is only on research excellence and not on entrepreneurship. The first set-up should be initialised by the EU. UV has different activities on different levels and phases. One of the vice rectors will be responsible for entrepreneurship within the university context. The plan is to first get an overview about all activities and then to systematically foster entrepreneurship on these levels, leading them under an umbrella brand.

The university lecturer and businessman Manuel Perez Alonso is an example in this area: he has created the National Association of Enterprising Scientists. Manuel Perez Alonso also takes part in the counselors' program and his company (IMEGEN) forms a part of the Board of Trustees of the BCC.

Level of faculties' and units' autonomy to act

Generally it is quite difficult to act autonomously, but every professor is free to choose the way he is teaching and the devices he is using. Therefore, understanding the impact of VPSS where professors can participate is essential for transferring entrepreneurship into the classrooms using the knowledge of their subjects and the instrument MOTIVEM (see section 20.3.3 on informal assessment of learning outcomes and feedback for students).

Organisational implementation

Broadly speaking, one has to distinguish between curricular and extra-curricular activities. Inside the university there is no specific entrepreneurship department or centre. Business

administration students can choose among different undergraduate and graduate courses of the Faculty of Economics. Extra-curricular activities are offered by institutional chairs. They are proper units, which are indirectly connected to the university and cannot offer curricular courses (at least since the Bologna process). Those institutional chairs are initialised by companies or organisations. The companies fund these activities so that they follow a specific objective, for example to teach entrepreneurship, narrowing the gap between theory and practice. The EE activities are mainly run within the context of ADEIT and respectively the BCC. Besides this, there are also other institutional chairs which offer courses but which are not relevant to this case.

In addition, the UV applied for the creation of the BCC as an instrument of promotion and revitalisation of the enterprising culture and the executive spirit. The Chair was founded from Valencia University Board of Trustees of the Fundación Universidad-Empresa de la Universitat de València (ADEIT) in 1999. Its formation was a result of the need expressed by the entrepreneurs themselves to promote the initiative and spread the spirit of enterprise in the University. To this end, the UV and ADEIT, through a partnership agreement signed between the two institutions on December 13, 1999, created the BCC. Since then and through its various activities, the BCC has been working toward the purpose for which it was designed; encourage and promote the teaching and dissemination of the culture of entrepreneurship among university students, heartening their entrepreneurship by transmitting the skills that allow them to access the world of business as one of the most representative sectors of society. Its major goal is to promote entrepreneurial spirit. The concrete objectives of the BCC are:

- Spreading entrepreneurial initiative and spirit.
- Encourage the teaching of entrepreneurial culture among the university community.
- Complement academic research and university through practical training that promotes company values.
- Facilitate the integration of academics in the private sector of the company at the end of their training, either becoming part of a private business or developing their own business.
- Encourage college students to develop their own business and contribute thus to the creation of companies.
- To provide students with essential training to answer any concerns surfacing regarding their business.

The Vice Rectorate of Investigation and Scientific Politics centralises and coordinates everything related to entrepreneurship at the UV. It allows the different centres of the UV to accomplish enterprising activities, in particular the VSPP.

University's importance for driving entrepreneurship in its environment

The current knowledge society gives a new third mission to universities by virtue of which, in addition to their traditional functions (teaching and research), they have to assume a new role in the field of entrepreneurial activities, innovation and knowledge transfer. Through this third mission, the BCC plays a key role in this process within the University as a benchmark in the field of entrepreneurship and the fostering of entrepreneurial culture among students, graduates and lecturers. Employability is a priority for universities and educational administrators and is vital for the manufacturing community to be able to take full advantage of the full potential and talent of young graduates. Hence the BCC at UV is crucial in this process.

The key to success is the triple helix approach of "university-government-companies". Since Valencia is a very important region in Spain, it is essential to raise the levels of (self-) employment. Therefore a strong communication, particularly between the university and the regional companies, is welcome and promoted. This is why ADEIT's offers are directly linked to their demands. Furthermore, several companies are associated and engaged in various courses of BCC's extra-curricular offer. Over 200 companies created by graduates of the UV and close to 600 students from the UV have gained exposure to business culture through the course, "*Who Can be an Entrepreneur?*". Over 300 graduates were trained in entrepreneurship and 17 businesses were created through the BCC. 146 lecturers from 22 Spanish universities have been trained over 5 years at the VPSS.

In order to create synergies and share experiences, in 2012 the BCC of the University of Valencia Alumni was set up. This is a space where alumni who have taken part in the Chair's various formative programmes can share their entrepreneurial experiences. So far, several gatherings have been held to discuss topics of business interest such as the importance of internationalisation, speeding up growth in business projects and customer loyalty using social networks, as well as various alumni meetings, in which some of the more than 1,000 alumni of BCC have had the opportunity to present their companies.

Since 2012, once a year the Alumni organisation celebrates a meeting with its members to encourage them to support the contact between the persons who have taken part in the different activities of BCC. The last alumni meeting was held in December 2014.

20.1.3. Resources: people and financial capacity

Human resources for entrepreneurship education

Within the scope of curricular activities, the courses are held by selected university professors. With regards to the extra-curricular activities there is a mix of university professors and external entrepreneurs and businessmen. The associated companies of ADEIT and the BCC are strongly involved in the teaching. The BCC, through its various activities, has opened an important communication channel between the business world and society through university knowledge. The Chair has allowed the region's main successful businessmen, who until recently had nothing to do with the University, to enter the University fold.

Financial resources for entrepreneurship education

The UV as a public university receives public funds covering a great part of its budget. Fees, research funds in competitive calls and research contracts complete the financial funds of the Institution. Generally speaking all courses offered by ADEIT and BCC are self-financed, but there is no profit orientation. The BCC's principal source of revenue is the membership contributions of the companies that form a part of the Board of Trustees and, on occasion, sponsorships. The BCC tries to cover at least the running costs of the programmes (teachers and management costs). However the associated companies of ADEIT and BCC pay an annual grant (ADEIT: 4,000€; BCC: 2,000€) for their activities.

With regard to the VPSS, the state of Valencia is supporting the programme with 30,000€ per year. After each VPSS an evaluation takes place to decide whether to continue the financial support or not. In 2012 the RE4 network started. ADEIT offers knowledge and method transfer to other universities in Spain, so that they can also implement and run a Summer School. The national government paid a total amount of 60,000€ to the 3 universities (Cordoba, La Laguna and Valladolid) so that they can participate in the programme. In 2014 the Valencian government extended the VPSS system, paying a total amount of 30,000€ to build up the REcv5 network with the other 4 Valencian universities.

20.2. Entrepreneurship in curricula and teaching

20.2.1. Overview about curricular offers

Since the Bologna process the former elective courses offered by the BCC, which were part of the curriculum, disappeared and now the offers are restricted to extra-curricular activities. These activities are now exclusively run by the Faculty of Economics.

The Faculty of Economics of UV offers different business Master's degree programmes (e.g. in accounting, auditing and management control, in business strategy or in corporate finance) taught in Spanish. The "Creating and Managing Innovative Companies" Master's degree is the only one focussing on entrepreneurship. Besides a profound basis in management skills and tools, this one-year programme provides students with different kinds of entrepreneurial courses, which are listed in exhibit 1. For undergraduate students there is one optional course in the international Bachelor's degree programme in "Business Administration and Management". This elective course is the only one taught in English.

Exhibit 4: Overview about curricular EE offers at the University of Valencia

No.	Name	Objectives	Target group
1	Creation of Innovative Companies	The aim of the course is to develop entrepreneurial skills for technology-based entrepreneurs. The understanding of the importance of personal characteristics for entrepreneurship is the main subject. The students learn to prepare business plans and to transform a basic idea into a real project. They learn how to reduce risks while, for example, identifying opportunities or allocating resources in a competitive environment.	Master students (of the Faculty of Economics)
2	Management of Technology-based Companies	This course is designed to analyse and discuss innovative, small-sized technology-based companies at its early stage. It is an introduction to different kinds of business strategies and models for start-up companies. Students gain an overview of the forces in the market and will be capable of identifying determinants of success and failure in innovative companies. Furthermore they learn basics for the development and launch of innovative products.	Master students (of the Faculty of Economics)
3	Management of I-D+i projects	The conceptual framework of project management and its application to management of research, technological development and innovation activities are the central themes of the course. Students learn how to apply different processes, the latest tools and techniques to manage and plan innovative projects/ case studies.	Master students (of the Faculty of Economics)
4	Seminars on Business Opportunities	Each seminar is dedicated to a subject of an innovative company. Students learn to identify business opportunities in emerging markets and how to face difficulties concerning the market entry. In all seminars, the insight in innovative companies is enhanced through guest lectures by 3-4 entrepreneurs and managers of such companies.	Master students (of the Faculty of Economics)
5	Technology, Innovation and Strategy	Students learn and understand the essentials that drive business innovation in a highly dynamic economic and business environment. The purpose of the course is to conceptualise and understand the three components which mainly influence the competitiveness of a company: technology, R&D and innovation. Besides presenting, analysing and discussing the content and implications of technology, R&D and innovation, there is a special focus on developing strategies that companies can adopt to implement innovation. To provide an applied vision of innovation management and knowledge, the course offers seminars and guest lectures from experts and practitioners.	Master students (of the Faculty of Economics)
6	Company Establishment and Entrepreneurship	This course intends to qualify students to create and manage new ventures and get in touch with entrepreneurial spirit and activity. The learning approach is basically practical. Applied exercises and assignments show the students how to turn ideas into real projects. Basic features such as generating new business ideas or writing a business plan are also integrated in the course.	Bachelor students (of the Faculty of Economics)

20.2.2. Target groups

The main target group of the curricular activities are the Master's students applying for the Master's Degree in "Creation and Management of New Technology-Based Companies". Because of the Bologna process – as mentioned before – elective courses integrated in the undergraduate and graduate programmes are no longer available. Therefore most of the

students who are interested in entrepreneurship have to engage in extra-curricular activities. These extra-curricular activities will be presented in the section representing the focus of the case.

20.3. Extra-curricular activities related to entrepreneurship education

20.3.1. Overview about extra-curricular entrepreneurship activities

The BCC has established a range of different extra-curricular activities for the target groups of potential and actual entrepreneurs amongst students, graduates, alumni, and staff. The offer is mainly oriented towards the entrepreneurial process – from opportunity recognition and idea generation to concrete seminars on how to start up your own business. Moreover, there is a mentorship programme for graduate entrepreneurs who have launched their business and are in the process of consolidating it with the aid of the businessmen (mainly part of ADEIT’s/ BCC’s associated companies) acting as mentors, who advise them on the different aspects of company management. In addition, ADEIT alumni organises networking events to promote the activity among former participants. To date, over 300 graduates have received training in entrepreneurship and 17 companies that were founded in connection with the activities of the Business Culture Chair have been mentored by 10 businessmen. An innovative concept is the **yearly one-week VPSS** which is meant to foster the entrepreneurial mindset among university professors, so that they can spread it to the students taking their courses.

Exhibit 2: Overview of extra-curricular EE activities at the University of Valencia

No.	Name	Objectives	Target group	Offered since [year]	No. of participants in [year]
1	Summer school (VPSS)	To inspire the professors on how to establish entrepreneurial spirit and mindset in their courses.	Professors from Spanish (and international) universities	2009	2009 (9) 2010 (17) 2011 (37) 2012 (40) 2013 (20) 2014 (23)
2	MOTIVEM Awards	These awards recognise the best entrepreneurial initiatives created by students who have been mentored by lecturers who have taken part in any of the 5 editions of the VPSS promoting the entrepreneurship spirit.	Students mentored by lecturers who have taken part in the VPSS	2014	2014 (57 professors and 424 students) 2015 (64 professors and 427 students)
3	Business Training for the Development of Business Ideas	The programme is aimed for graduates from the UV who have completed their degrees and plan to implement their business idea and create a company	Graduates of the UV who plan to carry out their business idea and create a company	2003	2003 (25) 2004 (25) 2005(25) 2006(25) 2007(25) 2008 (25) 2009 (75) 2010 (25) 2011 (50) 2012 (25) 2013 (50)

					2014 (25)
4	Mentorship Programme for University Entrepreneurs	To fill the gap between theory and practice; Entrepreneurs and professionals teach and consult a selected group of people in 9 different business fields (e.g. finance, law, marketing, internationalisation)	Graduates from the UV (any field) who have a concrete business idea or who have launched their business and are in the process of consolidation	2013	2013 (18) 2014 (24) 2015 (28)
5	Who can be an entrepreneur?	To hear first-hand about the business experiences of famous national businessmen	Bachelor and Master students from any field	1999	1999-2014 (600)
6	You can start a business!	Seminar on business motivation. Examples of best practice are given by graduates who have launched their business ideas and share them with students studying the same courses as they did.	Students of any field	1992	1992-2014 (3,140)

20.3.2. Target groups of extra-curricular activities

Generally speaking BCC's offers address students, graduates, alumni and staff. Since the courses are meant to help people in different project stages, target groups also differ. Courses for students aim to give orientation. They are open for students (undergraduate and graduate) from all over the university. Since for some courses the number of places is restricted, those students who already have a concrete business idea are favoured. The same procedure is applied for more advanced courses and seminars. In all cases, the participants must be related to the UV. The course offer aims at transmitting business values to the students, such as assessing risk, being awake to opportunities and evaluating success and failure.

The VPSS programme is open for professors all over Spain (and international universities). It is intended for university professors from any field who want to promote entrepreneurship among their university students, particularly for those who are not related to the area of business management. A total of 146 university professors have been involved in the 6 editions of the VPSS, 112 of them from the UV and 34 coming from the following ones:

- Spanish universities: University of Alcalá de Henares, University of Alicante, Autonomous University of Barcelona, University of Cantabria, University CEU Cardenal Herrera, University of Cordoba, University of Granada, European University of Madrid, University Francisco de Vitoria, University of Jaén, University of Málaga, University of Navarra, University of Oviedo, University of the Basque Country, Polytechnic University of Cartagena, University of Salamanca, University of Valladolid.
- Universities of other countries: Autonomous University of Tamaulipas (Mexico), State University of Paraíba (Brasil) and Metropolitan University (Venezuela).

20.3.3. Designing extra-curricular activities

The following explanations refer to the VPSS, since this is the main aspect of the case.

Intentions

The main objectives of the VPSS programme are as follows:

- To stimulate the business spirit and to cultivate an entrepreneurial attitude between the young people.
- To organise a summer school for training within entrepreneurship of university professors.
- To facilitate the exchange of experiences between the professors involved in business motivation of young university students.

- To involve the professionals and entrepreneurs in the transmission of their knowledge in order to facilitate the learning of university teachers.
- To equip the university teachers with the right tools, thus enabling them to transfer their knowledge.
- To generate a network of professors and business experts in order to support the future implementation of entrepreneurship teaching practice.

The advantage is the top down principle so that all relevant members of UV are involved and can possibly get inspired. Even though there are only a few extra-curricular activities, through the VPSS the entrepreneurial spirit can, however, be established in the curriculum in any of the university's disciplines.

A major incentive which supports the general objective of VPSS arises because of the economic situation in Spain. The participating professors fear that their students will not be able to find a job after finishing their degrees. That is why they want the objectives to be as applicable as possible to the companies' environment. In order to do so, the teaching style has to adapt to better meet the demands of the future employers.

Contents

Within the one-week programme, teachers work in mixed teams to face the challenge of dealing with people with different personalities and backgrounds. The 20-35 participating professors learn how to implement and foster the entrepreneurial spirit in their specific classroom environment. The objective is to build an individual guideline. The learned techniques shall help them figure out the characteristics of their students. Since everybody is different but has their qualities, mixing them can result in a strong team. An important aspect is how to motivate students to think outside the box, to be curious, proactive and risk-taking; to promote creativity and to break traditional rules, e.g. the professors participate in outdoor role plays. Moreover, they get material to design and construct prototypes.

Another aspect is working in teams, therefore the VPSS also organises a group event to build mutual trust and confidence (e.g. renting a boat for a joyride close to Valencia).

For professors of the UV there are no fees; for external professors the costs are 400€ for the week including meals. There is, however, no specific incentive (prize, recognition) for participating professors except the MOTIVEM Award (see below "Informal assessment of learning outcomes and feedback for students").

Methods

There is a 50:50 mix of theory and practical training in groups. The professors apply presentation-oriented teaching, elevator pitches, role plays, simulations, creativity games and case studies. There are also entrepreneurs involved for course assistance and in order to be as practice-oriented as possible.

Media

In the scope of the theoretical part, MS Powerpoint is used. For practical exercises, specific tools are applied individually.

To guarantee a sustainable result and to maintain the direct contact among the participants of the VPSS, there is a virtual platform to exchange ideas between the community members.

Informal assessment of learning outcomes and feedback for students

Within the VPSS programme the university lecturers are the participants to be trained. Their profile is heterogeneous in age, academic status, and professional profile. The best method to measure the impact on students after the lecturers' participation in the VPSS programme is the yearly business idea competition – "MOTIVEM Award". In order to participate, student teams need a mentor. These mentors must be teachers of the UV who have already participated in one of the editions of the VPSS programme. Hence the number of teams/ professors who participate in the competition directly represents the quality and the impact of the VPSS programme. So far 57 of the 112 UV professors have participated as mentors. During one semester, the teams attend a course on how to write a business plan every two weeks. At the end of the semester they are supposed to hand in an idea paper of around 10 pages. The 10 best student teams also receive two sessions on how to appropriately present a business plan. Of the more than 424

student participants (102 teams) from 12 degrees (biology, nursing, computer science, geography and environment, modern languages, human nutrition and dietetics, journalism, psychology, industrial relations, sociology and social work), 48% of the students indicated that when they finish their studies they would contemplate the possibility of self-employment. To further incentivise both students and professors, the best teams can win a prize up to 4,000€ (1st edition) where the according mentor receives a 25% share. Moreover, each member of the 10 best teams receives a scholarship for working abroad in order to gain more practical experience. Because of the competition's success in the first round, the prizes for the second edition have increased to 7,000€.

Furthermore, in order to evaluate the quality of the implemented techniques, the professors can ask for course attendance of the VPSS teachers or entrepreneurs.

Using results of extra-curricular activities of entrepreneurship education

Lecturers can be ambassadors of entrepreneurial culture in the classroom through their participation in the VPSS. Within this training, periodic activities have been held in classrooms by these lecturers, motivating their students through different group dynamic exercises involving university entrepreneurs. Within their teaching, they are supposed to integrate the learned techniques (toolbox) into their courses and so change their teaching style. Recognising the characteristics of their students, the teachers can figure out which students might be fitted to become an entrepreneur and take one of the courses offered by the BCC. The professors can further motivate these students to participate in the business idea competition MOTIVEM.

20.3.4. Setting of extra-curricular activities

Locations

With the support of the vice rectorate of Investigation and Scientific Politics and that of Academic Arrangement and Professorship, the BCC organises its activities in the different centres of the UV as well as in the ADEIT building (24 classrooms). ADEIT offers modern installations to organise and host activities. The headquarters of ADEIT are situated in the city centre of Valencia, with more than 5,000 square metres and incorporates the necessary technical sources: seminaries, congresses, work meetings, formation courses, book presentations, press conference, etc.

Timing

The VPSS programme takes one week during the semester holidays and comprises 30 hours in total, 6 on each of the 5 days.

MOTIVEM has a duration of 4 months from kick-off up to the delivery of prizes (from January until May yearly).

20.3.5. Persons involved in extra-curricular activities

Besides the responsible persons of ADEIT/ the BCC who organise the VPSS programme, there are 2 teachers conducting the VPSS programme; 1 of the university professors for entrepreneurship of the Faculty of Economics of UV and 1 businessman/ entrepreneur which is associated with ADEIT/ the BCC.

20.3.6. Management of extra-curricular activities

The extra-curricular activities are mainly run by the externalised ADEIT, respectively the BCC. The main advantage is the fast reaction time because of its independence from the UV. However, the involved organs are as follows:

- University of Valencia: Vice rector for Teaching Staff and Academic Planning: Maria Vicenta Mestre Escrivá; Vice rector for Research and Science Politics: Pilar Campins Falcó
- Technical commission for the MOTIVEM: The business ideas that fulfill the requirements of the competition will be evaluated by the technical commission composed of experts and

professionals related to entrepreneurship. They will select ten ideas for presentation to the Commission of evaluation.

- Commission of Evaluation: This commission, composed of representatives of the UV, of the administration, of participating companies and of representatives from media, evaluates 10 business ideas proposed by the technical commission.
- The Jury: The evaluating jury is formed by the Rector, the President of the BCC, a high representative of the administration, and a representative from a managerial organisation. It meets to decide on the ranking of prize winners and to grant the second prizes to the professorship.

Management of persons involved in extra-curricular activities

Certainly a plus is that ADEIT's/ the BCC's staff, which is dedicated to the management of EE, exclusively focuses on organising and conducting entrepreneurial courses as well as establishing and maintaining the network and the stakeholder management. There is no research focus besides. This clearly helps to be efficient. Another aspect is the 30 associated companies to ADEIT (24 to the BCC). Besides paying an annual grant to the organisation/ chair, 4,000€ each for ADEIT and 2,000€ each for the BCC membership, they further get involved in planning and conducting courses. Therefore, there are several meetings per year in order to satisfy individual expectations. The major input is the participation in the "Mentoring Programme", where 9 businessmen consult young university entrepreneurs with regard to specific business topics such as marketing, internationalisation, finance etc.

Managing student support

Student support is derived from the entrepreneurial process and offers EE and support for any stage of the process. Within the course of "Who can become an Entrepreneur?" the first orientation is given. The participating businessmen and entrepreneurs talk about their specific business experiences. For this course, interested students should ideally already have a business idea. In order to promote the motivation of interested students, they can then participate in different business motivational seminars under the slogan "You can start a business!", in which graduate entrepreneurs share their formative experiences at the BCC and challenges in building up their business. Within the MOTIVEM Awards, interested students can come up with their own business idea.

Once the first steps are undertaken and the graduates from UV plan to carry out their business idea and create a company, there are further programmes to teach relevant business knowledge such as the "Business Training for the Development of Business Ideas". For graduate entrepreneurs who have launched their business and are in the process of consolidating it, businessmen acting as mentors advise them on the different aspects of company management within the "Mentorship Programme".

Internal and external network management

There is an intense contact between ADEIT and the companies which form a part of the Board of Trustees. For example, the companies and ADEIT organise joint education activities (the companies take an active role in entrepreneurship teaching). Also, the companies cooperate with ADEIT regarding their student and graduate recruiting. ADEIT is the central unit for matching company internship positions and UV students. All activities performed in the foundation are disclosed in the university community through the ADEIT website, mailing lists and newsletters.

Management of possible integration of extra-curricular elements

Before the Bologna process, the courses offered by the BCC were elective courses. ADEIT is now trying to re-accredit them.

Evaluation of learning outcomes and informal feedback to students

The VPSS participants can be evaluated in the classroom by VPSS professors on how they implemented the learned techniques. First analysis of feedback has shown that more than 90 % of the participants would recommend this procedure to the entire professorship interested in promoting entrepreneurship among their students.

20.4. Institutional aspects of entrepreneurship education

20.4.1. Organisational set-up and change

Measures for coordinating and integrating entrepreneurship education across the university

In order to be allowed to integrate e.g. a specific research, teaching activity at the university level, companies or other organisations can build up an institutional chair which is dedicated to a specific interest of its founding members. There are currently 38 institutional chairs at the UV dealing with different topics. 5 chairs are related to entrepreneurship:

- Business Culture Chair
- Bancaixa Chair for Young Entrepreneurs
- ATA-UV Chair for Self-Employment
- Chair for Family Business
- Cátedra Excelencia y Desarrollo en Emprendimiento: de estudiante a empresario

Apart from the BCC there is, however, no specific dedication to education in entrepreneurship within the other institutional chairs (which only address related fields such as family business or innovation). That is why the focus is here set on the BCC.

The UV and the ADEIT created, by means of an agreement of cooperation, the BCC of the University of Valencia. The objective was to foster and promote the teaching and spread of business culture among university students. The idea is to encourage an entrepreneurial mindset through the transfer of the knowledge, which will allow students to join the business world as one of the more representative areas of the society. The BCC is managed by a board composed of university teaching staff and recognised businessmen/women. The advantage of the external position of the BCC is its fast reaction time to develop and implement new programs for interested students and young entrepreneurs.

Influence of external stakeholders in the entrepreneurship education programmes

The members of the ADEIT/ the BCC trustee board have a direct influence onto the programmes' design and content. Besides the financial engagement, company representatives also participate in teaching students and young entrepreneurs as well as mentoring within the scope of the "Mentoring Programme". They are welcome to bring feedback to BCC and propose solutions. Since the regional and the state government are involved in the VPSS programme, there is also a vivid exchange after each edition of the VPSS in order to report current matters, feedback and future plans. Certainly the key to the Chair's success is based on the close cooperation between the stakeholders: the UV, businesses and government.

20.4.2. Laws, statutes and codes

Incentives for staff to engage in or support entrepreneurship education

There is no specific incentive concept for fostering entrepreneurial engagements on the part of the professors. Through BCC and VPSS, the participants for their part try to implement more entrepreneurial thinking in their courses. If their students participate at the MOTIVEM Awards and win a prize, the professors receive a 25% share of the winnings.

Incentives for other stakeholders contributing to entrepreneurship education

The businessmen and executives play an active role in several programs of the chair:

- Who can be an entrepreneur?
- Mentoring Programme
- You can start a business!
- BCC Alumni

The businessmen and executives obtain two types of incentives: material and immaterial. The material incentives are:

- Obtaining a certificate for successful realisation of the course sent by the Rector of the UV.
- Being presented in a monographic book that recognises the contribution to the Chair in two years.
- The teachers who take part in the final round of MOTIVEM obtain 25 % of the monetary prize.
- The teachers who participate at MOTIVEM and present more than one idea obtain a second prize.
- All the ideas presented in MOTIVEM are published in a digital catalogue. The catalogue includes the students who have elaborated them, the teachers who have promoted and coordinated them as well as the teachers' collaborators.

The immaterial incentives are:

- Professional and social recognition.
- Media presence in the context of the UV.

20.4.3. Mindsets and attitudes

Raising awareness for the importance of entrepreneurship

The UV, across the participation or organisation of different forums or events, tries to raise awareness about entrepreneurship. The main formats are:

- "Day of the Enterprising Person" of the Valencian Community: The objective is that entrepreneurs of the Valencian community have a place for sharing their experiences and knowledge as well their concerns.
- Employment and Entrepreneurship Forum: This event held annually aims to facilitate relations between companies (entrepreneurs), students and graduates from the university. Companies and institutions will provide information to the participants on employment offers, selection processes or how to seek jobs.
- Forum of Employment of UV: Event that is celebrated once a year aiming to facilitate the contact between the companies and the students and graduates. In total 85 exhibitors, companies and institutions, offer information on how to create your own company.
- Science Week of UV: To promote the role of innovation and R&D in companies in general; during one week conferences, workshops and activities of promotion of the scientific culture are organised.
- Matching "Finance and Science" at the Scientific Park of the UV: the forum is dedicated to establish an exchange platform for scientists, entrepreneurs, and investors.
- Exposcience at Scientific Park of the UV: Open Day of the Scientific Park to present the laboratories and other facilities as well as scientific projects to the general public.

Encouraging entrepreneurial behaviour

Through the "Who can be an entrepreneur?" course, students from all degrees and fields of knowledge at the UV get to hear first hand all about the business experiences of famous national businessmen. In addition, young university graduate entrepreneurs, whose business ideas were nurtured through their formative experiences at the BCC, share their entrepreneurial challenges with students at the various universities through different business motivational seminars under the slogan "You can start a business!". In these seminars, examples of best practices are given by graduates who have launched their business ideas; their experiences are shared with students studying the same courses as they did. These seminars are not exclusively held in the economics department, but also in other faculties.

Furthermore the "Business Training for the Development of Business Ideas" and the "Mentorship Programme" for university entrepreneurs programs are two of the successful programs offered

by the BCC at the UV. These programs are aimed at graduates from the University of Valencia who have completed their degrees and plan to carry out their business idea and create a company (*Business Training for the Development of Business Ideas*) and; for graduate entrepreneurs who have launched their business and are in the process of consolidating it with the aid of the businessmen acting as mentors, who advise them on the different aspects of company management (*mentorship programme*). To date, over 300 graduates have received training in entrepreneurship and 17 companies that started up through the activities of the BCC have been mentored by 10 businessmen.

Lecturers can be ambassadors of entrepreneurial culture in the classroom through their participation in the VPSS. Through this programme, university lecturers are trained in entrepreneurial culture which they then transfer on to their students in the classroom. Within this training, periodic activities have been held in classrooms by these lecturers, motivating their students through different group dynamic exercises involving university entrepreneurs. The main objective was to measure the impact on students after the lecturers' participation in the Summer School. MOTIVEM is an instrument to measure this impact (see section 20.6.1 below).

20.5. External relationships related to entrepreneurship education

20.5.1. Types of relationships with external stakeholders

Companies from different sectors are involved in the BCC through their representation in the special trust that supports it. Trustees contribute with an annual grant to the chair as well as their personal commitment by coming in to the classroom to share their business experiences with students and graduates of the UV. The collaborators of the Chair are businessmen (senior and junior), managerial and professional. More than 330 collaborators have taken part in the offered programmes (number of collaborators in the programmes: Who can be an entrepreneur?: 120; Business Training for the Development of Business Ideas: 70; Mentorship Programme: 15; VPSS: 47; You can start a business!: 80).

20.5.2. External stakeholders involved in entrepreneurship education

Enterprises

On one hand, the involved companies participate in EE through programmes such as "*Who can be an entrepreneur?*" where they show their commitment in the classroom, reporting about their own business experiences. Another way is the "*Mentorship programme*" for university entrepreneurs. Within this offer, ten businessmen give advice to young entrepreneurs about specific business topics (e.g. Marketing, internationalisation, finance).

On the other hand, beyond the membership, generally interested companies can establish a relation to UV by participating in the internship programme organised by ADEIT. Within the scope of this offer, companies report possible internships to ADEIT which transmits them to interested students with a position-relevant background of studies and professional experience.

The following companies are members of the BCC's trust. Members of the companies share their knowledge and experiences with students and graduates: Baleària Eurolíneas Marítimas, Banco Banif, Cámara de Comercio, Industria y Navegación de Valencia, Colebega, Confederación Empresarial Valenciana, Consum, Edival, Emivasa, Engloba, Femeval, Ford, Fundación Banco Sabadell, Galvanizadora Valenciana, Gandia Blasco, GH Electrotermia, Grupo Boluda Corporación Marítima, Grupo Geisha, Grupotec Servicios Avanzados, Imegen, Mercadona, Supermercados MasyMas, Tecnidex, Umivale and Vossloh España.

In addition, the young businessmen forming part of the Alumni also participate in the activities of the BCC.

Financial institutions

The managerial projects generated by the BBC can provide access to preferential financing across the Valencian Institute of Business Competitiveness and Microbank. MicroBank was set up in 2007 as the social bank within "la Caixa" to channel the microcredit activity and later

taken over by "la Caixa" through its foundation in order to extend the concept within a professional banking organisation.

Support services

The "Business Training for the Development of Business Ideas" and the "Mentorship Programme" for university entrepreneurs programmes are two of the successful programmes offered by the BCC at UV. These programs are aimed at graduates from the University of Valencia who have completed their degrees and plan to carry out their business idea and create a company, or for graduate entrepreneurs who have launched their business and are in the process of consolidating it with the aid of the businessmen acting as mentors, who advise them on the different aspects of company management. To date, over 300 graduates have received training in entrepreneurship and 17 companies that started up through the activities of the BCC have been mentored by 10 businessmen.

20.6. Impact and lessons learned

20.6.1. Evaluating impacts of the entrepreneurship education approach

The best method to measure the impact on students after the lecturers' participation at the VPSS programme is the yearly business idea competition, MOTIVEM Awards. In order to participate, student teams require a mentor. These mentors must be teachers of the UV who have already participated in one of the editions of the VPSS programme. Hence, the number of teams/ professors who participate at the competition directly represents the quality and the impact of the VPSS programme. So far 57 of the 112 UV professors have participated as mentors. During one semester, the teams attend a course on how to write a business plan every two weeks. At the end of the semester, they are supposed to hand in an idea paper of around 10 pages. The 10 best student teams also receive two sessions on how to appropriately present a business plan. Of the more than 424 student participants (102 teams) from 12 degrees (biology, nursing, computer science, geography and environment, modern languages, human nutrition and dietetics, journalism, psychology, industrial relations, sociology and social work), 48% of the students indicated that when they finish their studies they would contemplate the possibility of self-employment. To further incentivise both students and professors the best teams can win a prize up till 4,000 € (1st edition) where the according mentor receives a 25% share. Moreover, each member of the 10 best teams receives a scholarship for working abroad in order to gain more practical experience. Because of the competition's success in the first round the prizes for the second edition have increased to 7,000 €.

20.6.2. Lessons learned

One major lesson learned concerning the VPSS is the content of the programme. In the first two years, the focus was set on teaching the participants how to write a business plan and how to create a company. This was difficult and not suitable, particularly for professors without a business background. They were hardly motivated and considered it to be difficult to implement the learned content in their courses. As a result, the concept of the programme was revised. The new focus was rather set on the motivation for carrying out a project and creating a company than teaching actual business knowledge. With this orientation, the participating professors got more inspired for the entrepreneurial spirit and culture. Furthermore, they were able to transmit it to their students by applying the (self-) developed techniques. Instead of the professors teaching business planning, in the new programme design, students receive relevant business and entrepreneurial management knowledge through business seminars offered within the MOTIVEM programme by staff from the Faculty of Economics and external entrepreneurs. The promising effect can be judged from the high rate of participating mentors (67 of 93) at the MOTIVEM Awards. The VPSS programme has already shown its potential. Hence, the EU is funding similar projects (based on environmental issues which are part of "Climate KIC").

A substantial present and future concern is the accreditation of the offered courses for students. Because of the Bologna process, the former elective courses became extra-curricular – which in turn led to a decreasing interest. In order to continuously spread out the entrepreneurial spirit

and besides the positive effects of the VPSS in the classrooms, there should be some practice-oriented curricular offers which are supported by entrepreneurs and businessmen.

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Section 2: Case Briefs

1. Freie Universität Berlin



Freie Universität Berlin (FU Berlin), literally the "Free University of Berlin", is one of the eleven German universities to be included in the German Universities Excellence Initiative. It has approximately 29,000 students and its eleven academic departments consist of more than 4,200 staff. Its main campus is located in Dahlem, Berlin.

FU Berlin has comprehensive curricular and extra-curricular entrepreneurship education (EE) offerings for its bachelor and master students. EE is focused mainly on start-up creation and idea development. Entrepreneurship modules have been integrated by the faculties of Physics, Management and Marketing, Informatics, Economics, Biology, Chemistry and Pharmacy, and Life Sciences. In 2001, the Entrepreneurship Campus was set-up as a virtual platform for students and entrepreneurs to share ideas and resources. The Campus itself is a virtual space, but is also used to collaborate on extra-curricular EE projects and initiatives, such as an event series "Laboratory for Entrepreneurship" and the annual "Entrepreneurship Summit". Entrepreneurs can also participate in seminars and competitions, such as the "Youth Citizen Entrepreneurship Competition" (together with UNESCO) "Funpreneur Competition", the "Business Plan Challenge" and the "Research to Market Challenge". FU Berlin also has its own spin-off service, "Profund", which offers start-up counselling, technical and financial support, access to mentors and coaches, and free of cost start-up space on the campus in one of the three "Gründerhäuser" (founding houses).

The teaching methodology at FU Berlin employs a variety of approaches, i.e. "self-directed learning", "network-based learning" and "attendance phases". For students interested in self-directed learning, the Entrepreneurship Campus offers courses that can be started individually at any time. Courses are made available to students by e-mail in weekly intervals and the tasks are solved in a password-protected online environment. Networked learning is implemented with the help of contests, such as the "Entrepreneurship Challenge", i.e. a business idea challenge consisting of three phases. In the first phase, students work together with a "sparring partner" to develop an idea. Coaching is offered on the theme of business idea development. In the second phase of "entrepreneurial marketing", the formulated ideas are made open to online voting on the entrepreneurship website (www.entrepreneurship.de). The ten ideas with the most votes are presented to a jury that selects its favourites. The participants in the Challenge then work together to improve and deepen the techniques together in the third phase of learning, i.e. "attendance phase". All ideas are published at the end in an "Idea Book", which can be openly accessed by anyone. The success of this approach is apparent, since as of early 2014 the entrepreneurship website had 6,934 active members. In the "Founder's Garage" competition of 2014 (together with Google, Volkswagen, 3M and Allianz), around 2,000 contestants participated; 800 ideas were submitted and an estimated 100,000 Euros were given to the winners.

2. University of Hertfordshire



The University of Hertfordshire (UH) is one of UK's leading business-facing universities. It is the largest employer in the region, with more than 25,000 students in ten different faculties. UH aims to shift the traditional university and student focus of employability toward a more entrepreneurial outlook by integrating entrepreneurial education (EE) at both undergraduate and postgraduate levels through various curricular and extra-curricular initiatives.

EE is not simply aimed at creating student entrepreneurs but also "entrepreneurial students" – students who develop entrepreneurial mindsets, which significantly and positively affect their attitude, behaviour and skill-set regardless of their work environment. UH has successfully introduced compulsory enterprise and entrepreneurship modules in 36 disciplines. The goal of these courses is to familiarise students with the nature and importance of enterprise, to learn to identify business opportunities and to experience the process of planning a business.

Compulsory curricular EE is complemented by a range of extra-curricular activities, such as the "Business Start-up Programme", an initiative that provides students and recent graduates with practical support to develop, market and launch their business ideas within one year. Participants benefit from three intensive weeks of workshops, are assigned a business mentor and given support throughout the year. Another such initiative is the "Flare Business Ideas Challenge", which is a business plan competition that supports and gives cash prizes to students with innovative start-up ideas. A revolutionary achievement for UH has been the design and creation of a profiling and matchmaking software, "Team-Match", which allows inputted student data to form teams and analyse them across different behavioural classes, easing the process of creating teams from a large body of students and ultimately formulating advice for teams on how to work better together. Team-Match is also available to other universities who intend to simulate and learn from valuable team experiences.

As a result of these efforts, UH was awarded the Times Higher Education Entrepreneurial University of the Year Award 2010, as well as the National Enterprise Educator Award 2012 for Team-Match. At the institutional level, UH has incorporated the "Careers and Enterprise Service", which has created "School Engagement Teams" for each department that provide discipline-specific support for both graduate and self-employment. UH's efforts have increased the level of Student Engagement in Enterprise (SER) to 70%, against the UK engagement level of 16% and 24% across Europe.

3. Satakunta University of Applied Sciences



Satakunta University of Applied Sciences (SAMK) is located in the Satakunta region at Finland's West coast. It is the largest higher education institution in that region and has six faculties, eight campuses and approximately 6,300 students. SAMK, together with a consortium of three other higher education institutes in the Satakunta region, forms the "Satakorkea", which is a body of higher education institutions with common guidelines and goals, such as the promotion of micro-enterprises across the region.

*Entrepreneurship education (EE) at SAMK is focused on "**blended learning**" methods, which are integrated into curricular offers and extra-curricular activities. These methods include e-learning, independent studies, group work, contact teaching and tutoring. The goal is to increase student interest in entrepreneurship by stressing its importance as a future career option. Once students learn more about entrepreneurship, they are able to consider it from their individual starting point, e.g. their self-image, personal competencies, and networks. SAMK defines this framework as "effectual entrepreneurship".*

Since 2013, the University has renewed efforts to integrate EE across all disciplines by introducing "Basics of Entrepreneurship", which is a series of lectures that form a core competence in the study curriculum. The Faculty of Business and Culture exclusively offers a Masters Programme in "Business Management and Entrepreneurship", which is taught in both English and Finnish. Students also have the option to widen their entrepreneurial education by choosing elective modules, such as "Developing a Business Idea" and "Developing an Enterprise", as well as having the option of completing their field placement or thesis in their own enterprise, with the help of the "Enterprise Accelerator". The Enterprise Accelerator is perhaps the most distinctive out of all these approaches because it facilitates students in creating their own enterprise. It includes a body of expert mentors, who are typically from SAMK's education and research staff, and occasionally from other partner organizations. These mentors help students in developing a new business plan, and aid students who are intending to acquire an existing enterprise. The Enterprise Accelerator also acts as an incubator once the initial stages of the business plan have been implemented. It has been designated as a Centre of Excellence in Education (2005 - 2006) by the Finnish Ministry of Education.

The impact so far has been the creation of nearly 200 enterprises since the inception of the Enterprise Accelerator, 14 years ago. Further information is available online on SAMK's official website (<http://samk.fi>) and its student-run Agora News Blog (<https://agorasamkinenglish.wordpress.com/>).

4. University of Malta



UNIVERSITY OF MALTA
L-Università ta' Malta

University of Malta (UoM) is situated in the town of Msida on the north-eastern coast of Malta. It is the highest teaching institution in Malta, with approximately 11,000 students, including a large body of international students. UoM has 14 different faculties and various interdisciplinary institutes and centres. Besides the main Msida campus, there are two other campuses. The Valletta campus situated in the capital and the Gozo Campus on Malta's sister-island, Gozo. One of UoM's broader aims, through the Centre for Entrepreneurship and Business Incubation, is to foster socio-economic development in Malta by transforming entrepreneurial initiatives into real-world activities, such as the creation of enterprises.

Entrepreneurial education (EE) at UoM aims to promote entrepreneurship in general, and also more particularly seeks to foster a "knowledge-intensive entrepreneurial culture", i.e. the process of transforming scientific advancements into marketable goods and services. EE is integrated into the curriculum through curricular and extra-curricular offers. Courses and study units such as "Entrepreneurship and Business Venturing" and "Entrepreneurship and Innovation" are taught at the Department of Management within the Faculty of Economics, Management and Accountancy, and the Edward de Bono Institute, named after the renowned Maltese physician, as part of a Master programme in "Creativity and Innovation". The Institute is also the National Host for the "Global Entrepreneurship Week" activities in Malta.

At the forefront of all EE initiatives is the Centre for Entrepreneurship and Business Incubation (CEBI). The centre has quickly grown to undertake major entrepreneurial activities aimed at providing a "hands-on, practical learning approach" to students. In 2013, it started the development of a Master programme in "Knowledge-based Entrepreneurship" with Isis Innovation Ltd., the technology transfer arm of the University of Oxford. The Master programme is an intensive training programme (ITP) for graduates. It is taught in four week-long bursts over two semesters, using traditional teaching methods such as lectures and seminars. The programme consists of seven study-units, and mentored feasibility and business planning projects.

The Knowledge Transfer Office of the UoM and CEBI launched the TAKEOFF Business Incubator in 2014 – an innovative start-up development space on the UoM campus, which provides facilities and business support to entrepreneurs. It has also collaborated with other incubators in Malta to create an online community of entrepreneurs that hosts informal meetings, conferences and seed-funding events. CEBI has succeeded in launching Malta's first funding programme, the "TAKEOFF Seed Fund Award", a joint initiative with the Ministry for the Economy, Industry and Small Business (MEIB) intended to fund early start-ups.