

Lund University: Embedding Entrepreneurship in a Regional Context

Kathrin Bischoff

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 EE. 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.

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Case Fact Sheet

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: 7540 Professors: 840 Lecturers, researchers and doctoral students: 4350 Technical and administrative staff: 2350
Budget in 2013:	Total revenue in SEK million: 7475 Direct government funding in SEK million: 4101 Grants/external revenue in SEK million: 2413 Other revenue in SEK million: 959 Total expenditure in SEK million: 7552 Staff in SEK million: 4596 Premises in SEK million: 946 Other expenses in SEK million: 2010
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 disciplinary boundaries and externally to tackle demanding problems”
Entrepreneurial profile:	At LU, an action-oriented approach is employed for EE. Simultaneously, analytical thinking is fostered and knowledge from contemporary research is deeply embedded into EE. This teaching approach has been themed as “action-reflection”. Connections to companies and support systems in the region are close
Activities focused in this case:	Curricular and extra-curricular activities, external relationships related to EE
Case contact person(s):	Prof. Hans Landström, Professor in Entrepreneurship at SKJCE, and Marie Löwegren, Director of SKJCE, SEM, LU

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

1 The University's Entrepreneurship Education Profile

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 education.¹ 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 represent 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 Sect. 5). IDEON Science Park represents one of Scandinavia's largest science parks and is thus a vibrant, innovative and unique environment for EE. 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 7500 employees in 2013. The university grew strongly throughout the twentieth century and is at present one of the oldest and largest institutions of higher education and research in Scandinavia. LU has been ranked for several years 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 twenty-first century and received considerable funds for doing so. In order to keep its EE up to date, the university has continuously reflected upon its teaching activities and has consistently adjusted its educational approach by developing new best practices.

The institution with the strongest link to entrepreneurship at LU is 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.

¹Lund University (2014). Lund University—Education, Innovation and Research since 1666. Information Brochure. Lund: Lund University.

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 there are 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 EE are offered at LU. One example represent 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).

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 EE strategy, most importantly through the provision of seeds and funding.

SKJCE is funded to a large extent by the government (see Sect. 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 EE at LU was initiated by the Swedish government as a push strategy. In turn, in the year 2003, Prof. Landström received additional funding for EE 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 Sect. 2). SKJCE nowadays offers a wide range of entrepreneurial courses at four out of the eight faculties of LU (see Sect. 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 EE 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 EE 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 twenty-first 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 wanted to see more output of university research and continuously pushed for entrepreneurship and innovation. One interviewee mentioned that there has been an increase in entrepreneurship activity at LU in the past years mainly due to Eriksson's initiative.

Level of Faculties' and Units' Autonomy to Act

When it comes to EE, 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, EE 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 EE. 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 EE by bringing in external partners into its educational activities (see Sect. 5).

Entrepreneurship courses are foremost offered at the SEM, next to the Faculty of Engineering, Science and Humanities, and Technology. Besides, EE is becoming more important at the Faculty of Fine Arts. As stated by the interviewees, no direct resistance to EE 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 already full curricula was further emphasised leaving little room for the integration of additional entrepreneurship-related courses into the curricula.

The organisational implementation of EE ultimately remains a question of resources, which makes funding for elaborate and continuous EE of utmost importance (see Sect. 1.3). The majority of all funding is provided by the government to LU, which then distributes it to the faculties, which in turn allocate funds to the respective departments. The reporting, in contrast, goes from the departments to the faculties to LU to the government.

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 EE 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 EE 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 EE. Funding for EE 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 Sect. 1.2, innovation and entrepreneurship are considered as a priority area for a funding campaign due to LU's 350 years' celebration (see Sects. 1.2 and 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 Sect. 5).

2 Entrepreneurship in Curricula and Teaching

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 EE offers at LU on the undergraduate, graduate and PhD level can be found in Table 1.

Table 1 Overview about curricular EE offers at Lund University

No.	Name	Objectives	Target group	Offered since	No. of participants in 2014/2015
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

(continued)

Table 1 (continued)

No.	Name	Objectives	Target group	Offered since	No. of participants in 2014/2015
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: Business and entrepreneurship	Give an introduction to the entrepreneurial opportunities for engineers; provide knowledge on the entrepreneurial process and practice to create a business plan	Undergraduates in technology studies	2009	70
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	Master students in economics and social science	2010	20

(continued)

Table 1 (continued)

No.	Name	Objectives	Target group	Offered since	No. of participants in 2014/2015
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 and innovation studies	N/A (not offered in 2014/2015)	PhD students, interdisciplinary (all faculties at LU)	2013	25
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

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, 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 Sect. 5).

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%–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.

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 1-year programme in total encompasses 60 ECTS, including four 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 Sect. 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 1-week entrepreneurial challenge. The purpose of this challenge is to gain experiences and to generate ideas for market opportunities. There are teams of four to five 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 invites 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 Sect. 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 the respective 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 EE into teaching.

SKJCE has created a research program on EE, 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 EE. 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. EE 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 EE has shaped the pedagogical view at SKJCE. 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, EE embraces action as well as learning from theory and is thus termed as “**action-reflection theory**”.

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 h 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.

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 Sect. 5). While the Centre was already quite well established in its educational activities, it was 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 SKCJE'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. EE 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 EE. The aim is to share their entrepreneurial experience with the students (see Sect. 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 Sect. 5).

Within the **CEI track** students are not assigned to 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.

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 selection of 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 EE see Sect. 5.

Evaluation of Courses and Programmes

Evaluation of courses is of utmost importance at SKJCE since the evaluation of EE represents one of its main research areas. A continuous reflection of its EE 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 EE 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 EE is that tension between academics and practitioners in the national evaluation system can be noticed.

3 Extra-Curricular Activities Related to Entrepreneurship Education

3.1 Overview of Extra-Curricular Entrepreneurship Activities

LU offers a variety of extra-curricular activities in the field of EE to its students. Table 2, 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 Sect. 5.

Table 2 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 their business ideas during 3 months of full time work	Students from LU, Malmö Högskola, BTH, SLU Alnarp and Högskolan Kristianstad	2012	84 project evaluations in total since 2012
4	Activities by FENA (e.g. Innovation bazaar, business and beer, learn to talk, connection board, FENA TV)	To encourage entrepreneurial behaviour among students	Students from LU, interdisciplinary	2004	Appr 70 participants per activity
5	European EE workshop and European entrepreneurship award	To foster a better understanding of EE and to exchange best practices (Workshop); to highlight the importance of teaching and learning in the	Researchers, educators and policy-makers interested in entrepreneurship (Workshop); Any person or organisation active in EE in Europe who has contributed to	2012	30–50 per year

(continued)

Table 2 (continued)

No.	Name	Objectives	Target group	Offered since	No. of participants
		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 EE on university level (Award)	teaching entrepreneurship, through education, research or outreach activities (Award)		

Box 1 Venture Cup

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 50–60 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 and society, environment and energy, and web, software and 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

(continued)

Box 1 (continued)

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 EE 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 Sect. 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 ten workshops by itself.

Box 2 Dragons at the University**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 Sect. 5.

Box 3 Leapfrogs**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 Sect. 5.

Box 4 FENA

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 EE 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 and 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 and Smoothies”. A new project that is being launched at the moment 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.

Box 5 European EE Workshop and European Entrepreneurship Award

European EE Workshop and European Entrepreneurship Award

LU annually organises a “European EE Workshop” for researchers, educators or policy makers in EE 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 honour 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 EE approach on the

(continued)

Box 5 (continued)

basis of its novelty and innovativeness, its potential impact and transferability, and its relevance for a public beyond academia.

4 Institutional Aspects of Entrepreneurship Education

4.1 *Organisational Set-up and Change*

Marie Löwegren, Director of SKJCE, stated that the EE 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 Sect. 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.

4.2 *Laws, Statutes and Codes*

In Sweden, entrepreneurship has recently been introduced as a mandatory topic in secondary school education. In the long run, this will have great importance for EE 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 Sect. 5). Funding for university-based start-ups is managed through support services like LUIS (see Sect. 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 EE, 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 EE, such as case studies, which makes teaching more diversified.

4.3 Mindsets and Attitudes

The educational activities described in Sects. 2 and 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 Sects. 5 and 6).

5 External Relationships Related to Entrepreneurship Education

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. Below an overview of the primary external stakeholders involved in EE at LU can be found. Each stakeholder group will be described in more detail subsequently (Table 3).

Table 3 Overview of external stakeholders involved in EE at Lund University

No.	Stakeholder	Type of involvement in EE
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

5.2 *External Stakeholders Involved in Entrepreneurship Education*

Enterprises

Local and regional enterprises are deeply integrated into EE 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 Sect. 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 eight-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 Sect. 2). Moreover, entrepreneurs and company representatives are situated as advisory board members of the SEM. Besides, they can be engaged in EE 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 EE. To begin, all alumni from the MPE (see Sect. 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 tracking 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 EE at LU. Examples of student organisations with a clear linkage to EE 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 Sect. 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 Sect. 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 is 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 Sect. 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 EE 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 Sect. 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 Sect. 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 1 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" organised 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 Sect. 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 min; 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 6 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% public funding and 40% 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 EE, 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 Sect. 2). Moreover, Ideon Innovation is a member of FENA's steering group (see Sect. 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 EE at LU, TCP nonetheless remains closely connected with LU by being involved in EE 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 2700 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 EE at LU, the park is of 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 Sect. 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.

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 2200 freestanding courses at LU, roughly 500 are taught in English to attract foreign students. Five 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".

6 Impact and Lessons Learned

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 five were holding companies with LU as part-owner. The University's innovation system has invested in more than 70 companies that have generated above 2500 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 40 placements (see Sect. 2).

SKJCE are currently involved in three different projects where knowledge of EE is transferred. The first is an EU project within the Tempus framework, where there is a co-operation with nine 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.

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 EE. At LU students do not solely receive excellent EE 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 EE 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 EE offers for the cultural and creative sector.

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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 Sept, 2014

Mats Dunmar, Manager Ideon Open, interviewed in person on the 22nd of Sept, 2014

Hanway Tran, Head of Finance at FENA, interviewed in person on the 23rd of Sept, 2014

Mikaela Färnqvist, Project Leader at Venture Lab, interviewed in person on the 23rd of Sept, 2014

Debora Voges, Project Leader at Creative Plot, interviewed in person on the 23rd of Sept, 2014

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Julia Selander, Regional Manager of Venture Cup, interviewed in person on the 23rd of Sept, 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 Sept, 2014

Sven Olsson, Business Developer at LU Innovation System, interviewed in person on the 24th of Sept, 2014

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