

## Seminar: „Educating and training the next generation of technology entrepreneurs“

RWTH Aachen Campus, SuperC building  
Thursday, 17 October 2013

### *Lecturers*

Paul Hannon, Tom Peterson, Malte Brettel, Arlindo Manuel Limede de Oliveira, Antoni Giró i Roca, Mats Lundqvist, Jean-Luc Koning, Andrea Rangone, Michal Kotoul, Paul Althuis, Seppo Laukkanen.

### Executive Summary

#### *Introduction*

The seminar “Educating and training the next generation of technology entrepreneurs” held at the RWTH Aachen on October 17<sup>th</sup>, 2013 mainly addressed the question how technical universities can successfully implement and foster entrepreneurship. The speakers at the seminar shared experiences and approaches to entrepreneurship at different universities across Europe. The following summary will give a brief overview of the topics touched upon during the seminar presentations, classified in three themes:

- Session 1: Institutional strategies for innovation and entrepreneurship
- Session 2: Entrepreneurial education and training: Examples of best practices
- Session 3: University infrastructures supporting innovation and entrepreneurship

The presentations can be found under: <http://www.cesaer.org/en/news-items/news/cesaer-seminar-2013-presentations/>.

#### *Common baseline: Entrepreneurship requires serious attention*

Yet, before going into the individual sessions, at this point a common baseline can be drawn as a starting point: All speakers in the seminar agreed that, in general, entrepreneurship is very important for universities. As Paul Hannon put it, entrepreneurship is seen as key driver of innovation and can be the answer to the unprecedented levels of change in the world that lead to higher levels of uncertainty, complexity and unpredictability. Entrepreneurial skills are beneficial to individuals for behaving in a globalized world of greater complexity and uncertainty. Therefore, entrepreneurship education is increasingly important, enjoys rising public attention but also faces rising expectations regarding its outcomes and impact on individuals, organizations, societies and the economy at large.

Emphasizing the importance of entrepreneurship, Tom Peterson argued that there are economic, political, investment and workforce drivers behind the high interest in entrepreneurship. He takes the USA as an example and shows that, there, government has realized the importance and benefits of entrepreneurship and provides substantial federal funding for one agency responsible for innovation and entrepreneurship across the whole country.

### *Keynote speeches*

The seminar was opened by two keynote speakers, Paul Hannon and Tom Peterson. Using the example of Swansea University and its new Science and Innovation Campus 2015, Paul Hannon focused on the challenges and opportunities of the future entrepreneurial university. Further, he gave several examples of European and UK universities and their approaches to entrepreneurship and provided a framework that explains how the entrepreneurial university can be reviewed. Tom Peterson explained that entrepreneurship and innovation are supported centrally in the US through the National Science Foundation (NSF) that, with a budget of some \$ 7 billion, funds basic and translational research, and education for science and engineering. Regarding entrepreneurship, he showed the NSF Innovation Corps (I-Corps™) as a set of activities and programs that prepares scientists and engineers to extend their focus beyond the laboratory towards entrepreneurship and broadens the impact of selected, NSF-funded, basic-research projects. As a major conclusion he emphasised that entrepreneurship education is best integrated in undergraduate education already and a national network for innovation and entrepreneurship is very effective.

### *Session 1: Institutional Strategies for innovation and entrepreneurship*

In that session it was emphasized that for a university to be successful in entrepreneurship, entrepreneurship needs to be implemented in the strategy of the university. This is because for entrepreneurship to work the university needs a widely shared commitment to entrepreneurship.

At the RWTH Aachen University a long term approach for advancing entrepreneurship has been developed. The entrepreneurship approach combines teaching, research and practices and uses synergies between the three fields. An entrepreneurship center supports start-ups in all phases of their business and a variety of programs are offered for students and academic staff interested in entrepreneurship.

The mission of the Instituto Superior Técnico (IST) in Lisbon regarding entrepreneurship lies in changing the mindset of students, professors and researches. Innovation and entrepreneurship should be in the mind of every engineer because of its increasing importance. Being a very large school in a small country IST has a key role in changing the mentality of the whole country. Therefore, IST has developed a clear strategy for technology transfer that includes as a core part introducing entrepreneurship in the curriculum of undergraduate and graduate students. Also, researchers and faculty will be addressed and their interests and initiatives will be stimulated and supported. Furthermore, the interaction with incubators, technology parks and agencies is actively supported and access to venture capital funding is facilitated.

In order to be entrepreneurial, the Universitat Politècnica de Catalunya (UPC) in Barcelona aims at strengthening concepts like imagination, responsibility and initiative in its activities in the areas of research, education and management. Their technology transfer model that has evolved over the years has the objective of successfully bringing technology to the market thereby closing the gap between research and practice – and building the bridge between research and innovation. Important aspect of the technology transfer process is the INNOVA program of the valorization unit that has the mission to support and enhance the research developed at the UPC. It strives to create an innovative culture, to promote entrepreneurship and to support the creation of new technology-based (knowledge-based) companies.

*Session 2: Entrepreneurial education and training: Examples of best practice*

Higher education institutions should have a strategy or action plan for teaching and research in entrepreneurship, and for new venture creation and spin-offs. This session described how universities approach entrepreneurship education and what they think are best practices for training entrepreneurs.

According to the view of the Chalmers School of Entrepreneurship at Chalmers University of Technology in Sweden entrepreneurial activities should be broadly implemented in the engineering curriculum and not only via extracurricular courses as they are mostly today. They argue for an integration of bottom-up (project-based and creative) and top-down (fulfilling pre-specified learning outcomes) approaches of entrepreneurship training. A successful example is an elective course with participants from 11 engineering programs participating and winning the formula student competition.

Also in France, at the Institut National Polytechnique de Grenoble (INPG) entrepreneurship teaching is part of the curriculum. The university offers a course that simulates the new venture creation process starting with an idea. In three steps, idea elaboration, idea implementation and business plan presentation the students follow the entrepreneurial process. The course is very successful and is ranked highly positively by students due to several success factors: Working on a self-chosen project in real conditions and in a self-chosen team, students are highly motivated and are actively participating. The success of the project is their own responsibility and they feel they can create something which holds them engaged and fosters the entrepreneurial spirit. Furthermore, they can interact with real business partners which makes the process all the more realistic and exciting.

The entrepreneurship training at Politecnico di Milano goes beyond the classroom teaching. The university offers the PoliHub (incubator), the Startup Program (Entrepreneurial Empowerment) and the Startup Boosting (Mentorship Program). PoliHub, currently hosting 45 startups, is an incubator with a co-working space offering additional services and events to entrepreneurs. The Startup Program is an action learning program (or bootcamp) run in cooperation with Italian expert entrepreneurs. This program concludes with a presentation in front of a VC committee and already 130 start-uppers have attended. Startup Boosting provides startups with a mentor with specific expertise in the relevant sector that supports the development of the entrepreneurial venture and helps finding necessary capital.

*Session 3: University infrastructures supporting innovation and entrepreneurship*

This last session described cases of which kind of infrastructure is beneficial for supporting innovation and entrepreneurship. Special attention is given to the interaction of different stakeholders and the creation of an innovative and entrepreneurial environment by a group of stakeholders capable of achieving a lot more than only one individual entity.

The case of Brno University of Technology in the South Moravia Region is a good example for joint stakeholder action to improve entrepreneurship. The city of Brno is the regional centre and capital of the South Moravia and hosts 5 universities with more than 80.000 students. Together with the regional

authproties a strategy for fostering innovation (innovation policy) has been established in order to use synergies between the city, the region, the government, universities and the innovation centre.

At the Brno University of Technology itself entrepreneurship is taught in courses, a project support centre exists and the technology transfer office offers workshops with foreign experts. Furthermore, a fruitful exchange with companies has been established. Entrepreneurs are offered Starcube, a startup accelerator with free training program and expert advice for students. In addition, entrepreneurs can present their ideas to potential investors and receive feedback in the MIC minutes program. Last but not least, two incubators provide support for startups.

The TU Delft is a strong supporter of an integrated approach. This means that all faculties and all students are aware of and included in (the same) entrepreneurship programs. Entrepreneurship is key at the university, there is a clear path for entrepreneurship courses throughout the university career of each student and entrepreneurship teaching is closely linked to research in respective innovation centers. Furthermore, there is a strong link between the university and the municipality of Delft.

Also Aalto University recognizes the multidisciplinary and many existing facets of entrepreneurship in different setting such as institutes, factories, project, programs, and platforms. The university acknowledges the importance of the whole “entrepreneurship ecosystem” consisting of education, research and Innovation and established a variety of different offerings for students and entrepreneurs alike.

### *The Seminar in Aachen as starting point for CESAER Task Force entrepreneurship*

To conclude, the 2013 CESAER Seminar provided valuable insights and examples of how entrepreneurship and entrepreneurship teaching is integrated at different universities of science and technology across Europe.

Participants highly appreciated the experience and the approaches of other universities. However, they identified also a need for clear guidelines and recommendations with regard to entrepreneurship education and training. Therefore, as a follow up of the CESAER Seminar 2013, a CESAER Task Force has been set up with the aim to explore how the next generation of entrepreneurs can be successfully trained at universities of science and technology.