

SuperWiseNet - a unique network platform to leverage student entrepreneurship projects

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INTRODUCTION

The area of interests is the development of a potentially new complementary industry-university component, which has been labelled 'SuperWiseNet' for the context of academic entrepreneurial programs. The SuperWiseNet is a network-

based platform for interaction between students of entrepreneurship and an experience-enriched forum consisting of teachers, industry experts, entrepreneurs and specialty consultants. The interaction unfolds as a series of workshops facilitating the progression of the student teams' four months project work. The students of concern are enrolled in the international Entrepreneurial Engineering Master's Program [1] at Aalborg University, Denmark (120 ECTS credits).

The paper will describe and elaborate on the functioning of SuperWiseNet including a discussion of advantages for students, faculty, and industry/externals as well as some challenges with the concept.

The paper primarily draws on empirical evidence from the authors' engagement in the design, execution and continuous development of the workshops.

Research Question: How does SuperWiseNet function as a means of industry-university interaction, which is combining entrepreneurial activities with learning in the Entrepreneurial Engineering Master's program?

1. BACKGROUND

Aalborg University was founded in 1974 and amongst the first universities in the world applying a university-wide concept of problem-based project-organised teaching (see e.g., [2], [3]). The concept has proved successful since then and new ways are currently sought to renew the concept. The concept states that students should target and actively engage in real world problems while applying and developing contributions to theory.

During 2012-2013, a cross-disciplinary team at Aalborg University designed a new Master's program the Entrepreneurial Engineering Master's program with the dual purpose of graduating entrepreneurs and corporate entrepreneurs. The program structure and content is illustrated in the *Fig. 1*.

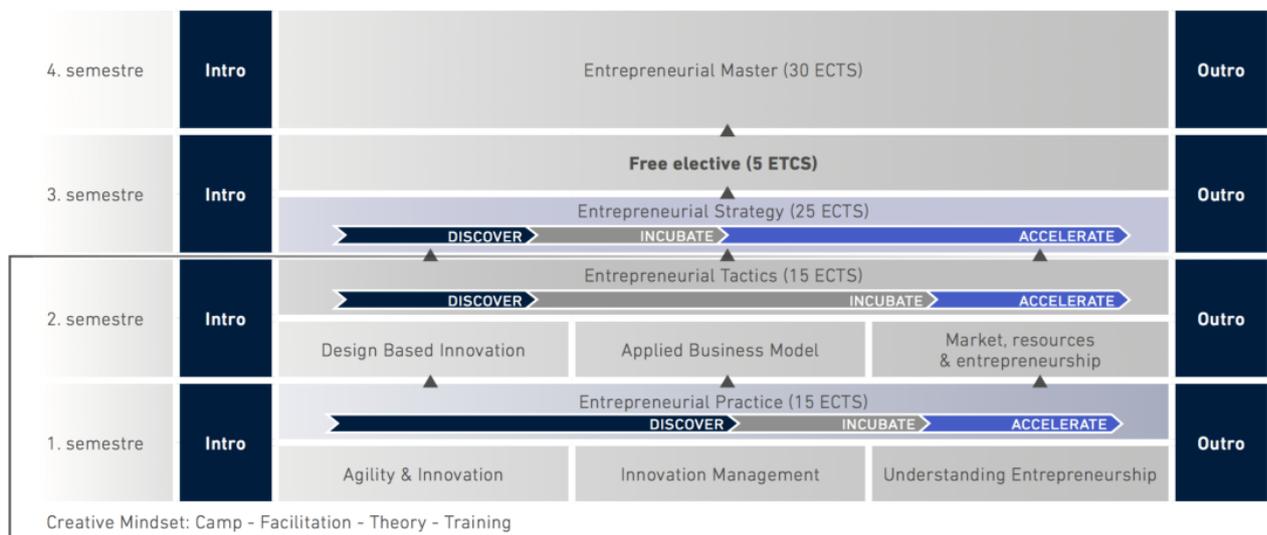


Fig.1. Overview of the Entrepreneurial Engineering Master's program [1].

In each of the first two semesters half (15 of 30) of the ECTS credits are earned through semester projects carried out by teams and the other half are earned through three courses of 5 ECTS each. The third semester is typically an internship in an existing company or in own start-up, and the master thesis is a full 30 ECTS project. The progression build into the program reflects the progression of a generic innovation process, using the concepts of the D-I-A model (Discovery, Incubation &

Acceleration by O'Connor et al [4]). This progression is applied both across semesters and within each individual semester (the latter is indicated by the illustration in *Fig. 1*). The courses have been designed to underpin the content of the semester projects and ensure learning of different aspects expected of entrepreneurs or corporate innovators. A culture of 'learning by doing' through prototyping, testing, and failing is being pushed to the students, especially in the project-based team. The culture is inspired by theories, principles and tools from design thinking, e.g., [5], [6], radical innovation [4], lean start-up [7], effectuation theory [8] and creativity theory [9] respectively.

Part of the cross-disciplinary group that designed the program now constitutes a core operating team of four faculty holding main skills in entrepreneurship, innovation management, industrial design, communication, digital media systems, creativity, and learning.

2. THE 'SuperWiseNet' (SWN)

During the developing and launching of the program a new way of interaction with industry and other externals to the program emerged and was later labelled the 'SuperWiseNet' (in short SWN). Some members of the core team had experience from using similar formats in large student workshop-events and from other master programs (the latter, less externally oriented though). The SWN serves as part of the supervision of student teams as well as an industry-networking activity for the program. It should give the students a closer-to-field experience and some options of validating their ventures with minimal effort by the utilization of the experts' knowledge. The composition of each SWN (workshop) is based on invitations to a list of about 40 interested actors who have agreed to be part of the network. The number of people in each SWN varies between 4-12 with a mix of internal and external experts.

The SuperWiseNet, in its practical form consists of three 4-hour network workshops each semester with about one month between each. The workshops' thematic progression follows the Discovery, Incubation & Acceleration themes [4].

The guidelines provided to the students for each workshop have developed over time and continue to do so. As an example, the current set of guidelines/evaluation criteria being used for the first (Discovery) SuperWiseNet in the second semester are:

- Find the Idea
- Identify the Need/Pains/Problem(s)
- Create a potential Solution/Cure/Solution or direction of solution
- Create initial Assumptions (about need/pain/problems)
- Create first Action Plan
- Pitch 1-3 Needs/Solutions/Problems
- Identify Customer Base (target group for your solution)
 - 'Who and why?'
 - Identify Major Uncertainties
 - Identify Business Value / Idea Value/Solution Value
- Identify Team's Capabilities to meet the above.

The student teams prepare a 'one-pager' about their project, which is made accessible to the SuperWiseNet before the workshop. In the workshop the student teams pitch their projects and the experts and teachers provide feedback based on criteria (cf. example above) for each workshop/innovation phase alongside their general expert knowledge of the project areas.

The workshops use different formats in terms of how the project pitches and feedback is organised but in all cases the students are challenged on their power of imagination and get extensive feedback on their work from the experts. The feedback allows the students to abandon, pivot, or strengthen their ideas in the following period until the next SuperWiseNet.

To some extent the SWN resembles activities going on in the growing number of professional incubators around the world (including those linked to funding bodies). However, few of these are integral parts of tertiary teaching programs.

Thus, the SuperWiseNet tackles a gap, which is commonly known amongst teachers of innovation management and especially entrepreneurship, namely the two questions of whether we can actually teach entrepreneurship in universities and how to evaluate the students' work in entrepreneurial education. The current prototype of the SuperWiseNet can be seen as a new means to help filling these gaps in teaching entrepreneurship in universities by helping students to bridge theory and experience-based practical knowledge on innovation and entrepreneurship and by helping teachers to evaluate the students' work.

2.1 Observed advantages and challenges

The observations comprise 22 SuperWiseNets during the period September 2013 to May 2016. Three classes counting 12, 16 and 21 students respectively have been involved, of which the inaugural class has graduated in the summer of 2015. *Fig. 2* shows the number of experts in the latest 11 workshops, split on teachers associated with the program ('program teachers') and 'externals', which covers industrialists, entrepreneurs, investors, 'third-mission' representatives, cross-disciplinary faculty (not involved in teaching). From a list of 40 invitees it has proven possible to sustain their interest over an extended period, with little investment (for most participants the program covers the direct use of time).

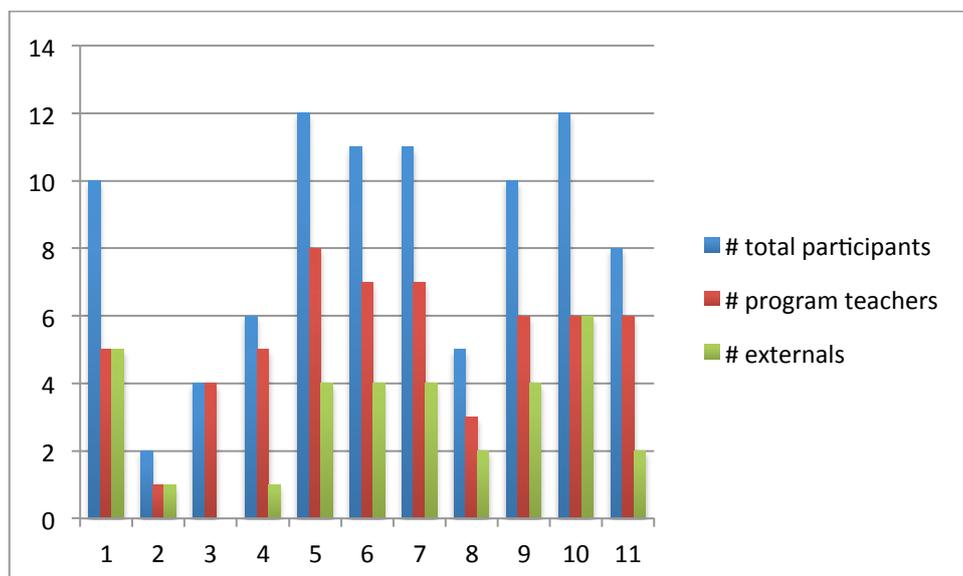


Fig. 2 The participants in the latest 11 SuperWiseNet workshops.

The SuperWiseNet has yielded many advantages as well as faced some challenges. These can be viewed from the perspective of various stakeholders, where the 3 most important ones are: Students, faculty, and external experts (a few more distinctions are made beneath in *Table 1*).

The students facing a diverse panel giving feedback on both proposals, communication and process are confronted with the intrinsic wicked problem of innovating and developing new enterprises, businesses and offers. The SWN becomes a test-bed for an abductive step in their process where they attempt synthesise their current status into a coherent proposal and at the same time open their underlying process and reasoning behind. Students' interaction with experts can help reduce their uncertainty and make a 'reality check'. The SWN can also help the students linking to relevant contacts useful for the projects as well as be a place for meeting and engaging with role models for a potential future of becoming entrepreneurs or corporate entrepreneurs.

The SWN affects the students' knowledge in terms of adding to their theory-based knowledge by interacting with people holding experience-based knowledge. The students typically utilize their explicit knowledge from manuals and research papers to establish a project and interact with experts with experience-based knowledge in the validation of their work. The professional dimension of entrepreneurship is often derived from practical experience in a known context. Such experience-based knowledge tends to be strongly embedded in our memory and feelings than theoretical knowledge (which may also be derived from experience, but in a more distance manner and more unknown context). Over the course of the whole program the students seem to gradually build implicit (or tacit [10]) entrepreneurial/innovator knowledge by repeating somewhat similar business innovation processes four times.

The effects of pitch training and the training in innovation (early) phases has been observed to shine through when the student participate in competitive innovation workshops with many other students. One such university-wide workshop, called WOFIE (Workshop For Innovation and Entrepreneurships at Aalborg University), repeatedly include 200-400 students in mixed teams of 4-6. There has been a clear over-representation of EE students in the winning teams.

For the faculty teaching in the program the SWN workshops serve as inspiration and help with aligning the supervision of student teams amongst the supervisors. The workshops help achieve internal calibration of expectations and exchange of viewpoints and perspectives through "live cases". Thus, the cross disciplinary team behind the education gradually build a coherent framework for the entrepreneurial development process, using the projects and especially SWN as point of convergence where practice and theory-based project work serves as a platform for dialogue.

The interaction during the workshops between the teaching faculty and the external experts help bridge the gap between industry-standards and university knowledge for all parties. Also, all involved parties gain a networking experience, which is a classic on-going necessity for an entrepreneur in order to grasp new potential.

For the external participants such as entrepreneurs, industrial innovators the SWN can serve as an opportunity to update their knowledge about trends, theories, methods and tools in the field. I can also strengthen cross-disciplinary university and industry networking and be an inspiration and help to build their own (corporate) entrepreneurship.

As mentioned earlier, the SuperWiseNet format has also faced some challenges. One of these is striking a proper balance between emphasis on practical application (industry standards) and emphasis on academic learning. However, this is a challenge not only pertinent to the SWN but to entrepreneurial programs in general. It is the impression, however, that the SWN allows for some integration and balance by

bringing the stakeholders together. The many different disciplinary (and cultural) backgrounds require a steep learning curve and push students outside their comfort zone.

At a more general level the organising of SWNs poses a few resource challenges. Given the disciplinary (and cultural) diversity of students as well as faculty, there is a challenge to find and continuously include external SWN participant matching the needed diversity of skills in the workshops. Also the effort of organising the workshops bares some extra effort, and especially if the future class-sizes continue to increase, the scalability may hold some challenges. *Table 1* summarized the discussion and add a few more items.

Table 1. Advantages and challenges of the SWN from the perspective of essential stakeholders.

Stakeholder	Advantages	Challenges
<i>Students</i>	<p>Training in efficient communication by repeated (8 times over 2 years) planning and execution of short project/business pitches against different stakeholders.</p> <p>Increase project radicality.</p> <p>Decrease project uncertainty.</p> <p>Project reality check.</p> <p>Build network for later studies and job.</p>	<p>The many different disciplinary backgrounds require a steep learning curve and push students outside their comfort zone.</p> <p>Challenge on their power of imagination.</p> <p>Decreased motivation when SWN turns down students' ideas.</p>
<i>Faculty teaching in the program</i>	<p>Inspiration for teaching.</p> <p>Break with traditional supervision of student teams.</p> <p>Align principles/norms of supervision of student teams.</p> <p>Strengthen industrial network for teaching and research</p>	<p>Secure synergy between students' research and real-life problems.</p> <p>Finding the right balance between emphasis on theory and application.</p> <p>Distinguish between students' learning per se and inferring about learning by assessing the outcome/results of the students' work.</p>
<i>Cross-disciplinary faculty</i>	<p>Meet like-minded faculty and get insight useful for own teaching.</p> <p>Research agendas emerge.</p>	<p>Finding time.</p>
<i>'Third mission' and entrepreneurship supporters</i>	<p>Strengthen industrial network.</p> <p>Spot potential entrepreneurs.</p>	
<p><i>Externals</i></p> <p><i>Entrepreneurs</i></p> <p><i>Industry (corporate entrepreneurs)</i></p> <p><i>Investors</i></p>	<p>Update knowledge about trends, theories, methods and tools in the field.</p> <p>Strengthen cross-disciplinary university and industry network.</p> <p>Inspiration and help to build corporate entrepreneurship.</p> <p>Potential engagement with ventures.</p>	<p>Finding time.</p> <p>Challenged by students' disruptive ideas (sometimes).</p> <p>Acknowledging and having patience with the emphasis on learning purposes.</p>

3. INDICATORS OF IMPACT BASED ON GRADUATES' JOBS

The paper elaborates on data from the first three generation of Entrepreneurial

Engineering students experimenting with the SuperWiseNet format as a new means of supervision and interaction with industry/externals. Only one generation has graduated so far. The kind of jobs achieved by the graduates may be a very first small indicator of impact of the Entrepreneurial Engineering program including the SuperWiseNet element. The first generation spawned twelve candidates with nine various bachelor backgrounds, ranging from having practical business knowledge already, technical engineering, entrepreneurial or economical knowledge. As previously mentioned, the students are encouraged to utilize their backgrounds and blend it with the new knowledge achieved in the masters program.

Most graduates from the first generation got a job within short time and all had a job within half a year. The jobs were characterized by:

- 4 are partners in one or more start-ups
- 4 work with business innovation in small and rather young mostly technology-based start-ups
- 4 work with product or process development in medium/large service or manufacturing companies
- 4 candidates excel in job content, which is clearly related to their bachelor skill-profile.
- 3 have job outside Denmark
- 4 were offered a job in the company that they collaborated with during their thesis-work (and some in internship as well).

In general the graduates who are employed in companies utilize their Entrepreneurial Engineering learning to innovate the business from the assigned positions such as, e.g., project managers and project workers. The entrepreneurs of this generation have managed to create companies that are thriving, and two of them have received high end funding to develop their venture.

4 FUTURE WORKS

The core team has started tested a series of different workshop formats of the SuperWiseNet, for instance, a format that requires and allows the students to train and experience a situation similar to tradeshow exhibitions. All students present on turns their business idea from a poster for two experts, which mimic real life sessions (the format is sometimes referred to as 'Speaker's Corner'). These setups are currently being evaluated to find the right setups for each workshop of the semester.

The program's core operating team is exploring potential ways of exporting the format to other fields than innovation management and entrepreneur cultivation. The authors believe that the format can be a better pedagogical tool to make students thrive in their different study fields as well as a means of evolving the extensive supervision that is part of the problem-based learning setup at Aalborg University.

The SuperWiseNet concept is continuously being developed including by means of a project funded by the Danish Foundation for Entrepreneurship/Young Enterprise.

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