

**Application for the Status as Centre of Excellence in Education (CEE):
Centre for Entrepreneurship at the University of Oslo (UiO)**

Our vision: 'SFE links insightful scholarship with thoughtful education'

The Centre for Entrepreneurship (SFE) is UiO's unit for education in science-based innovation and entrepreneurship, and has emerged into a hub for the nationally renowned *Gründerskolen* (GS). Based on this GS programme, a Master of Science (MSc) programme in innovation and entrepreneurship has been developed, and with the current application, we apply to develop and pilot a new teaching methodology based on design thinking with the MSc programme at UiO as the initial 'test bed'. Entrepreneurship, given its importance particularly in terms of knowledge-based economies, commercialization of university research and social and economic value creation, is an emerging area of interest. Although there has been an increased interest in entrepreneurship education (Kuratko, 2005), traditional learning and teaching methods do not seem to be sufficient to make entrepreneurial skills and knowledge learnable and teachable (Hwang & Powell, 2005). Thus, there is ample need for developing novel approaches and tools, and with this application, we aim to contribute to the development of more practice-oriented learning approaches grounded in 'design thinking'.

As an exemplar, GS received an Award in 2007 from the *Norwegian Agency for Quality Assurance in Education (NOKUT)* for the thorough planning and execution of the programme, confirming its importance as a role model. Moreover, GS received the 'Best Learning Environment' Award by UiO in 2006, and the programme was awarded 'Best Service Provider' by Nordic StartUp Awards in 2012. GS is nationally associated with what can be labelled a 'global entrepreneurship lab'; the programme has so far had 1500 MSc students in start-up internships globally. This experience and practice-based programme has a 15-year history, and this year, it supports *six cohorts* totalling 178 MSc students on *four continents*. We do not know of any similarly successful programme, except for MIT Sloan's 'global learning lab'. The core of GS is a 12-week experience-based exposure to start-ups in Asia, Africa, America and Europe, including tutorials and mentoring. The programme, organized by SFE, has this year had more than 400 applicants, and it is an active *inter-university co-operation* between most of the universities in Norway, and renowned international universities such as The University of California (at Berkeley), The National University of Singapore, The University of Cape Town, Rice University, and Boston University. This programme brings together students from Engineering, Natural Sciences, Business Administration, Arts and Humanities, and the Social Sciences with a focus on innovation and entrepreneurship action.

Objective of the Application

This application targets the establishment of a solid knowledge base of GS and the development of a more profound school of practice. SFE's goal is to develop educational programmes that are well suited to helping students translate their academic education into effective entrepreneurial practice. During recent decades, universities have been experimenting with various educational programmes in entrepreneurship, and many struggle with the MSc format. The main reason for this is that the curriculum of most MSc programmes is orientated towards understanding entrepreneurship, rather than towards the design or the creation of entrepreneurial artefacts (e.g. products, firms, new markets). Another challenge is connected with the dichotomy between theory and practice, and not least, the challenge of working between the natural science and the social science disciplines. Traditionally, much of the focus of entrepreneurship education has been on the subject matter to be taught, neglecting the importance of practice and experience-based education. In short, most programmes teach **about** entrepreneurship, they do not prepare **for** the practice of entrepreneurship, nor do they teach **through** entrepreneurship. Even business schools struggle with the teaching format (e.g. BI (the 'national' private business school) recently closed down its MSc programme in entrepreneurship and innovation).

We want to enhance the effectiveness of science-based entrepreneurship education, and we therefore seek to develop a new educational approach and a learning environment that stimulate and support students' engagement in entrepreneurship. As a consequence, the objective of this application is to develop a foundation for a new action-based teaching methodology that trains candidates **through** and **for** entrepreneurship, based on effectuation methods grounded on real, science-based cases. While such an educational programme is more resource demanding, we are convinced, building on our knowledge base acquired through GS, that this kind of pedagogical leap is highly important and necessary for providing quality in future entrepreneurship education. We choose to achieve this by employing the 'design model' elaborated in later sections of this application.

The Norwegian School of Entrepreneurship (Gründerskolen)

Before elaborating on the details of our application, we believe it is important to provide additional insight into GS. The first initiative behind GS was taken by Professor Nils D. Christophersen from the Department of Informatics at UiO. During the autumn of 1997, Christophersen spent his sabbatical leave at Stanford University. After his return to Norway, he launched GS as a way to strengthen collaboration between academia and industry. Table 1

demonstrates the growth of that particular programme, and it captures most of the input, process and output factors also elaborated in the subsequent sections in this application.

TABLE 1
Programme Destinations

Year	No. of students	Silicon Valley*	Boston	Singapore	Shanghai	South Africa**	London	Houston	Oslo***
1999	6	6							
2000	21	21							
2001	49	49							
2002	65	30	19	16					
2003	67	25	20	22					
2004	131	28	35	41	27				
2005	136	23	37	28	28	20			
2006	150	23	58	28		18	23		
2007	98	17	42	20	11	8			
2008	137	25	53	26	13	20			
2009	143	29	30	29	23	17		17	
2010	153	25	36	28		19		32	13
2011	168	36	36	29		18		32	17
2012	177	36	44	30		19		36	12
2013	178	39	47	30		11		34	17

* San Jose and/or San Francisco. **Johannesburg and/or Cape Town *** Oslo (SFE & ERASMUS students).

The table shows the growth of Gründerskolen with regard to the number of students completing the programme each year, and the addition of new destinations over time.

Current programme structure, status and success factors

While the programme has grown considerably in terms of student numbers and national and international partners, the initial ideas for the programme have been maintained over the years. A summary of the most important programme characteristics is given below:

- The programme teaches technology (science-based) entrepreneurship.
- The aim is to inspire students to start their own business or to work with entrepreneurship and innovation, and thereby to increase their chances of success by equipping themselves with relevant theory, experience and networks.
- The main part of the programme is a 12-week stay abroad, where the students work full time in start-up companies and follow tailored entrepreneurship programmes during evenings/weekends.
- Before the stay abroad, the students complete a full introductory course in entrepreneurship.
- In preparation for their stay abroad, all accepted students attend a seminar which is specifically designed to prepare them, both practically and mentally for their stay abroad. Cross-cultural understanding, reflective practices and leadership are typical topics covered. While abroad, the students reflect on, and log their experiences in diary format, and they submit a reflection report at the end of their stay.
- For every student cohort, there are typically 30-40 students at each destination abroad.
- The programme is open to students from all disciplines but the aim of the programme is that 1/3 of the accepted students have an academic background within disciplines such as engineering, natural sciences or medicine, 1/3 come from disciplines in management, economics and marketing, and 1/3 from other disciplines. This distribution of candidates is frequently typical.
- The programme consists of 30 ECTS credits at master's level, and the minimum admission requirement is a completed bachelor's degree, or the equivalent.
- Our current destinations abroad and the university partners there are San Francisco (UC Berkeley), Boston (Boston University), Singapore (National University of Singapore), Houston (Rice University) and Cape Town (University of Cape Town). It should be noted that, in 2009, the Cape Town programme was transformed into a programme focusing solely on social entrepreneurship, but still with the internship experience as a key component.
- In 2010, SFE launched an Oslo GS-based programme for SFE and ERASMUS students where the programme was initially created in co-operation with Oslo Cancer Cluster and Université de Toulouse.

The Gründerskolen programme has already been awarded three quality prizes

In 2006, GS was awarded ‘Best learning environment’ at UiO. In 2007, the programme was given a prize by the Norwegian Agency for Quality Assurance in Education, which emphasized the thorough planning and execution of the stay abroad, and the programme was awarded ‘Best Service Provider’ by Nordic StartUp Awards in 2012. In 2011, 86% of the students said that they would recommend the programme to other students, and 70% of the 2012 applicants said they knew someone who had previously attended the programme. Some of the positive outcomes highlighted by former students include the experience of personal growth from having dealt with many challenges and the new network of highly competent and ambitious entrepreneurial people. Moreover, 109 unique newspaper articles have been written about GS. The feedback we receive –almost without exceptions– are of the following nature:

Absolutely fantastic programme. You are doing a great job, keep it up! | Very good teaching programme! A+ | Gründerskolen has changed my life | Gründerskolen is a fantastic programme and is the best way to learn entrepreneurship in Norway | Excellent, I am very happy I did this! |

Connecting our vision with strategy: Strategy packages for the CEE

We have created two strategic development packages that directly relate to our new vision that ‘*SFE links insightful scholarship with thoughtful education*’. The first strategic development package (SDP) serves, jointly with ongoing research [A5], to develop a deeper understanding of entrepreneurship, while the second one elaborates on how we plan to do this within the educational framework of science-based entrepreneurship. The following two strategic development packages provide an outline for how we plan to reach our objectives:

SDP1: Advancing ‘insightful scholarship’ for innovative entrepreneurship education

There are many debates within the field of entrepreneurship and entrepreneurship education. Clearly, our understanding of entrepreneurship has consequences for the way we teach it. One of the debates, most explicitly prominent in the periodicals *Academy of Management Review* and *Journal of Business Venturing*, regards the ‘discovery theory’, advocated by Scott Shane (2003; 2012) in contrast with ‘creation theory’, most strongly advocated by Saras Sarasvathy (2004; 2008). This debate has led Venkataraman *et al.* (2012) to promote an understanding of entrepreneurship as a science of design. That is, whereas scholars favouring the discovery notion state that opportunities are found by entrepreneurs who then further develop these, scholars advocating the creation viewpoint state that opportunities are created by entrepreneurs. In SDP1a, we seek to advance the understanding of entrepreneurship as creation (that is, design), and we plan to develop this understanding interactively together with the methods advancement in SDP2 (a&b)).

A third group of scholars claims that opportunities are neither discovered nor created, but are instead imagined (Klein, 2008), and that entrepreneurship (action under uncertainty) is a function of the entrepreneurs' imagination and judgment. This debate is typically reflected in *Strategic Entrepreneurship Journal*, and the *Journal of Management Studies*. Major proponents of this debate are Foss and Klein (2012) who advocate the Cantillon-Knight-Mises understanding of entrepreneurship as judgment, that is, entrepreneurship understood as judgment under Knightian (1921) unknowable (that is, unpredictable) uncertainty. Judgments rest on various decision-making heuristics, and it is these heuristics that we seek to understand more deeply. Heuristics in entrepreneurial decision-making can be conceived of as what goes on between the mind and environment. This means the challenge for entrepreneurs is either to adapt to the environment, or to change or create it, and it is with the latter view that we enter into the debate of entrepreneurship as design. From a mind-environment point of view, we enter the heuristics debate over not only 'bounded rationality' (Simon, 1969), but also 'ecological rationality' (Gigerenzer *et al.* 2011) as a key asset of entrepreneurial expertise.

In contrast to the decision-making *biases* studied by (Nobel Laureate) Kahneman *et al.* (1982), Gigerenzer (2011) *et al.* highlight the *benefits* of the heuristics decision makers use. That is, heuristics and their affiliated judgments have significant implications for how we understand effectuation logics and the way people deal with uncertainty. In this SDP1 (a&b), we seek to understand these "value creating" heuristics more profoundly, and with an educational focus. We therefore take as point of departure the following research questions: ***How do entrepreneurs create/make decisions when time is limited, information is unreliable, and the future unknowable? How do novice entrepreneurs differ from serial or expert entrepreneurs? What can novice entrepreneurs ('our students') learn from that? What are the implications for our curriculum development?*** In order to be able to develop viable design-based programmes, we need to develop a more profound working knowledge of the activities that can potentially lead to successful entrepreneurship, and which ones do not. These insights will serve as an important knowledge basis for new MSc programmes and provide crucial input to our system of iterative programme evaluation and redesign.

SDP2: Advancing on 'thoughtful education' - new reflection-in-and-on-action methodology. This strategic development package aims at advancing thoughtful entrepreneurship education. By the term 'thoughtful education', we mean new methods and reflection technologies in support of a new teaching philosophy based on entrepreneurship understood as a science of

design. That is, this development package seeks to develop viable reflection technologies for science-based entrepreneurship education piloted at the master level.

a) Developing and piloting the methods in an action-based MSc programme
 Building on GS, we seek to make a pedagogical leap into a new teaching methodology to science-based entrepreneurship education. In this subpackage, we therefore seek to develop a design-based methodology that provides a more practical route to entrepreneurship training – in collaboration with Start-Up Lab, Inven2 (the university’s Technology Transfer Office) and industry. This entails that students enrolled in our pilot programme will follow a carefully designed and facilitated effectuation training programme as shown in Figure 1 and 2.

FIGURE 1:
Sarasvathy’s (2008) Effectuation Model with Reflection-in-and-on-Action Imposed

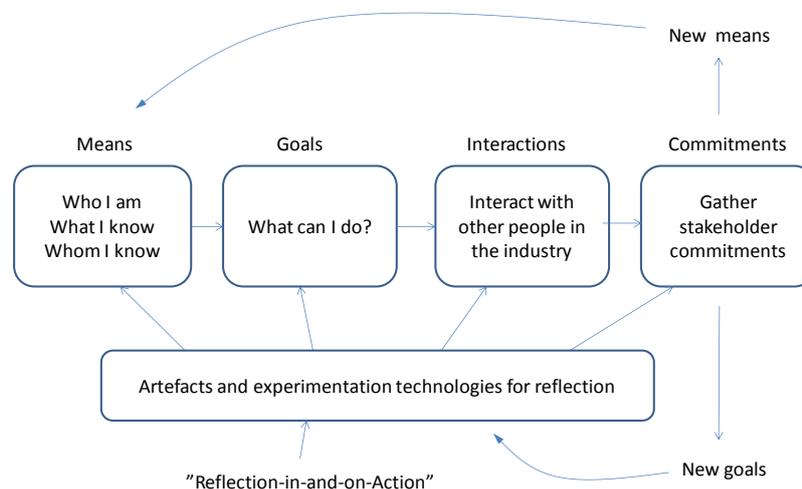
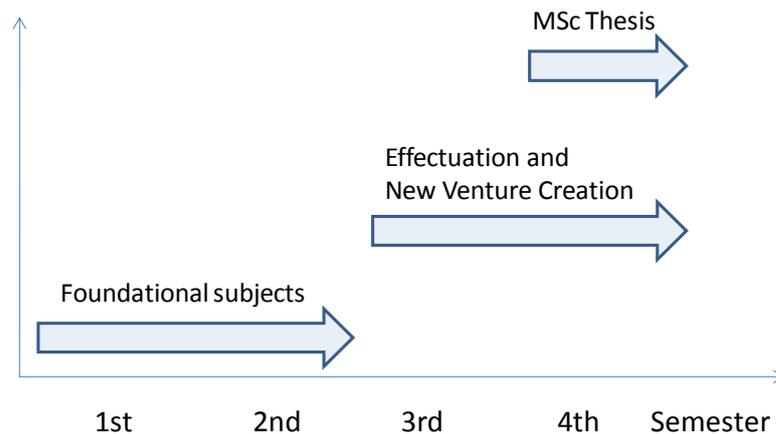


Figure 1 illustrates the effectuation methodology (the design logic), a practical method used by expert entrepreneurs uncovered by Saras D. Sarasvathy (under the mentorship of Nobel Laureate Herbert A. Simon). The effectuation model shows how expert entrepreneurs start with the means at hand (who they are, what they know, and whom they know), and then interact with potential stakeholders to create new products, firms or markets. However, in order to develop the framework beyond a classroom course, we also need to develop suitable experience-based ‘reflection-in-and-on-action’ methods, and this is what we seek to accomplish with the next subpackage (SDP2b). Venkataraman *et al.* (2012) argue that the design logic has not yet been recognized in entrepreneurship research and education, and that we need to move forward towards developing new insights and methods. Entrepreneurship as design deals with different degrees of uncertainty – possibly dependent on varying stages of venturing. Furthermore, a variety of artefacts and experimentation techniques are functional for different purposes.

Today, most educational programmes in innovation and entrepreneurship employ the causation methodology, or hybrids. However, we will here develop and pilot new training methods through a ‘practitioner’s track’, and develop the effectuation methodology into a ‘fully fledged’ design-based programme. In order to achieve this, we have already entered into more organized and tighter collaboration with our industrial partners [A4].

**FIGURE 2:
The Effectuation MSc Programme**



In addition, some of the student team projects could also be based on industrial ideas, so we need to develop stronger relationships with industry in order to source in science-based new ideas with suitable potential. We have already piloted the above-mentioned initiatives, and one example is shown in A6. This pilot received significant funding from the University Rector in the past few years. The lesson learned from this pilot, GS, and our collaboration partners, is that, while these action-based programmes are highly beneficial to the students and the other stakeholders, they are much more resource demanding; a methods development challenge that we can meet only with the additional CEE funding. In the appended timetable, we have outlined some major steps in the development of the design-based programme, see timeline and the general comments. A detailed plan is a prioritized task in early 2014.

b) Methods Development: Reflection-in-and-on-Action

In this subpackage, the aim is to prototype a learning arena for MSc entrepreneurship students that draws on previous experiences at SFE and models outlined above. In line with the international research literature calling for more emphasis on entrepreneurial competences as learning outcomes. By consequence, SFE has piloted an educational scheme for the MSc entrepreneurship students that integrates their writing of a thesis and a development of a science-based business together with industry. Two major approaches have been tested in

these experiments using innovative teaching methods – a reflection-in-action model inspired by the ideas of Schön (1983) and an action research approach (Coghlan & Brannick, 2009). Preliminary summaries of these constructions indicate that they have the following strengths and weaknesses: The “reflection-in-action” approach finds its empirical backing in counselling in health and social work or apprenticeship in artistry. Here the student is asked to reflect on his/her own behaviour (and cognition/feelings) in dealing, respectively with a patient or with a piece of art. For entrepreneurship candidates who are enrolled in in-service training, it is essential to have a forum and techniques that stimulate reflective practice. However, their projects do not involve only one “client” in a limited number of situations, but instead a lot of different actors in numerous situations and sites. Experience-based training methods may involve a myopia making one blind to contextual factors in the practice of entrepreneurs.

The “action research” approach (Coghlan & Brannick, 2009) provides a platform that can combine principles of action learning, artefacts/experimentation techniques for reflection and an awareness of institutional dependencies. However, the preliminary experiences involving MSc students in their thesis phase reveal that such an approach may be unrealistic and overambitious given the short duration of these projects. One of the strengths of this methodology is that it provides the students with tools for reflecting on their roles and strategies in complex institutional settings. International reviews of entrepreneurship education have pointed out that an overemphasis on “intention”, “self-sufficiency” and other psychological traits as outcome variables has led to students being insufficiently aware of their strategies and responses to the institutional ecology in which they navigate (Garavan & O’Cinneide 1994; Mwasalwiba, 2010). Based on these experiences and the aforementioned debates about entrepreneurship expertise, we are applying for CEE grants in order to develop and implement a design model of entrepreneurship education. This package will proceed through four steps: (1) design artifacts/experimentation techniques for reflective learning, (2) trial these in concert with the previous subpackages, (3) develop a system for iterative evaluation and redesign, and (4) conduct follow up studies of learning outcomes in relation to entrepreneurship competencies will be conducted. This framework will thus address the following questions: *How do artefacts/experimentation techniques improve reflective learning? In what way are they supportive to the development of entrepreneurship competencies? Does this type of action-based educational programme have a specific strength in influencing the professional success of entrepreneurs?*

The present and future organization of SFE

SFE currently has one full time professor (also the director), one full time associate professor, nine adjunct professors (in 20% positions) on teaching, two PhD students (see their supporting research in A5), and an administrative staff of four persons. To maintain quality in future educational programmes, we need to develop our educational methods knowledge platform, as it is unavailable on the market. As part of this CEE application, we will therefore recruit three PhD fellowships and/or postdocs in tenure track (recruitment) positions, as well as one more full time faculty member to develop the action-based design methodology. The PhD/postdocs will (with an additional teaching allowance) serve as co-developers of the design-based methodologies. As a CEE, SFE will be organized in the following way:

SFE's Management Team [A2]:

Mari Saua Svalastog, Programme Manager, Gründerskolen, UiO. [AS TODAY]
Professor Truls Erikson, Director, Centre for Entrepreneurship, UiO. [AS TODAY]
Cecilie M. Sundet, Head of Office, Centre for Entrepreneurship, UiO. [AS TODAY]

CEE Management Team [A2] Additions:

Professor Leif C. Lahn, Co-director, Department of Pedagogy, Faculty of Education, UiO.
Adjunct Associate Professor Mirjam Knockaert, R&D Director, Centre for Entrepreneurship.
Each 'work package' will have its own group leaders who will form the wider directorship.
Beyond the Programme Council (comprised of MSc students and internal and external faculty), the new centre's management team will regularly consult with the following advisory entities:

SFE's Scientific Advisory Board

Professor Solveig Kristensen, Vice-Dean, Department of Pharma, UiO. [NEW]
Professor Kari Kværner, Research Director, Oslo University Hospital (OUS). [NEW]
Professor Magnus Klofsten, Director, CIE/Helix Centre, Universitetet i Linköping, Sweden.
Knut Traaseth, General Secretary, Norwegian Venture Capital Association (NVCA).

SFE's Industrial Advisory Board

Kathrine Myhre, Director, Oslo Medtech [RENEWED]
Leif Rune Skymoen, Director, Nansen Neuroscience Network. [NEW]
Eva Næss Karlsen, Director, Oslo Renewable Energy & Environmental Cluster.
Jónas Einarsson, Director, NCE Oslo Cancer Cluster.
Øystein Lie, Executive Manager, MARE Life. [NEW]

Industrial Partnerships [A4]

Oslo Medtech (sources in industrial projects and internships). [RENEWED]
Nansen Neuroscience Network (sources in industrial projects and internships) [NEW]
Oslo Renewable Energy & Environmental Cluster (sources in industrial projects/internships)
NCE Oslo Cancer Cluster (sources in industrial projects and internships) [RENEWED]
MARE Life (sources in industrial projects and internships) [NEW]
Inven2 (sources in industrial projects and internships)
Start-Up Lab (facilitates innovation space) [NEW]

Academic Partnerships [A3]

University of Tromsø [NEW]
Norwegian University of Life Sciences
Department of Engineering, Bergen University College
Department of Pedagogy, Faculty of Education, University of Oslo [NEW]
Sahlgrenska Academy, University of Gothenburg, Sweden [RENEWED]
Adaptive Rationality Center, Max Planck, Berlin. [NEW]
The Darden School, University of Virginia [NEW]

Diffusion of knowledge and new methods

All new insights and methods will be employed in all our educational programmes, which in itself represents nationwide dissemination of new knowledge. As we develop new methods, we will develop and facilitate ‘train-the-trainers’ seminars, as these unique methods can be expected to receive global attention. We have already established pre-commitments with the recently launched global Effectuation conference to take a lead role in facilitating PhD teaching and research seminars (‘doctoral consortiums’), and we will contribute to facilitate and disseminate design-based teaching and research from this ‘global diffusion platform’. The second annual conference meeting is located to Lyon, France, in June this year.

Regionally, we will develop and test out the new methods in close collaboration with our industrial and academic partners – many with similar MSc programme challenges [A3]. Thus, the most active faculty members from these universities will serve in an advisory capacity (in the recruitment and co-supervision of the new PhD research fellows), and since the reflection in-and-on-action technologies are piloted and developed in close collaboration with industrial actors and the Department of Pedagogy, diffusion of the core reflection-in-and-on-action frameworks will take place gradually – in an interactive manner. In the second CEE period, we expect that tailored versions of these methods will be adopted and implemented by our collaborating partners (in the north, west and east of the country), and it is then naturally for them to take the lead in further developing and refining these methods.

In terms of the secondary outputs of the methods advancement work, we believe that publication in both national and international journals is the best way to disseminate quality assured knowledge. It almost goes without saying, all results will be presented and discussed at national and international teaching and research conferences prior to publication. Examples of such conferences are those arranged by the Academy of Management, European Academy of Management, Babson Entrepreneurship Conference, and/or the Effectuation conferences.

Finally, we will develop unique teaching materials that can be distributed nationally and internationally. These materials are probably optimally distributed through a website. We will also distribute digital Newsletters, make Apps, and use Gründer-TV to feature the new methods. The following extra-curricular activities involve students in various ways:

- SFE PhD Seminars** - Yearly held research seminars together with PhD students (2010-)
- SFE Quarterly** - Quarterly held research seminars with researchers and MSc students (2011-)
- SFE Roundtable** - Monthly lunch meetings with MSc students over a relevant article (2012-)
- SFE Colloquium** - Bi-monthly meetings held with industry leaders and MSc students (2013-)
- SFE Seminars** – Infrequently held seminars on ‘best practice’ entrepreneurship (2014-)
- SFE Gründer-TV**– Infrequently made Gründer-TV on educational methods (2014-)
- Entrepreneur of the Year** – Yearly Award (awarded by the MSc students (2014-))