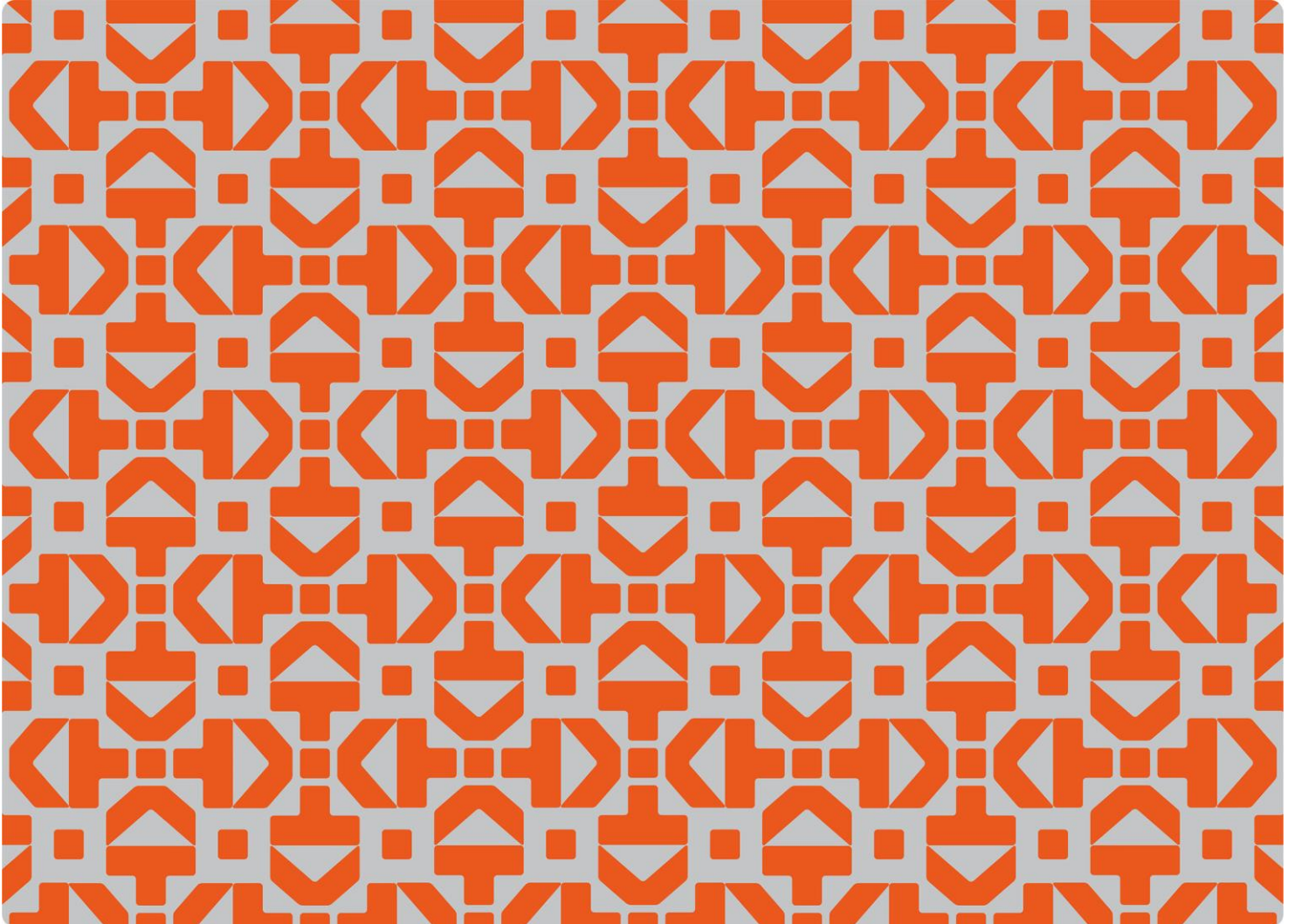


Institutional visits to the Centres for Excellence in Education



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Report from institutional visits carried out in November 2023

Authors:

Michael E. Caspersen

Inger Beate Pettersen

Mats Daniels

Torstein Nielsen Hole

Marit Ubbe

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Preface

The Norwegian Ministry of Education and Research launched the initiative “Centres for Excellence in Education” (Sentre for fremragende utdanning – SFU) in 2010. The programme has been administered by the Norwegian Directorate for Higher Education and Skills since 2019. In 2023, the Norwegian Ministry of Education and Research decided to phase out the scheme. Existing centres will continue their activities until the end of their current funding period.

By means of the Centres for Excellence in Education (SFU) programme, leading academic communities in Norway have been awarded resources to further develop teaching and education. The initiative has been a long-term effort to stimulate educational development and innovative approaches to learning in higher education at Bachelor and Master levels. The centres have a particular responsibility to disseminate knowledge and practices that lead to enhanced quality in higher education both within and beyond their host institutions.

Each SFU Centre received an initial grant for a period of five years with the possibility to renew their status for an additional five years after a mid-term evaluation. As part of the administration of the SFU scheme, the Norwegian Directorate for Higher Education and Skills conducted institutional visit to the centres during each period of funding. The first visit taking place just over a year into the initial centre period, and the second visit occurred midway through the second period. An external expert contribute to each visit and write a feedback report to the centre.

In November 2023 the directorate conducted institutional visits to the three centres awarded funding from 2016. These three centres completed their mid-term evaluation in 2020 and are in their final phase as centres for excellence. The visited centres were:

- Engage – Centre for Engaged Education through Entrepreneurship
- Excited – Centre for Excellent IT Education
- CCSE – Centre for Computing in Science Education

This report assembles the feedback given to the centres after the institutional visits.

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1 Centres for Excellence in Education – institutional visits 2023

1.1 Purpose and Process of the institutional visits

The aim of this report is to disseminate findings from three institutional visits in 2023. We hope the experts' findings and perspectives is useful both for existing centres and other academic communities working with quality enhancement in higher education.

The institutional visits to three centres for excellence in education aimed to:

- Assist the centre in achieving its goals through the following means:
 - Providing formative feedback. Facilitate a larger discussion on the centres' work and methods through the perspective of an external expert level.
- Provide new knowledge about large innovation projects in higher education based on the centres' work.

The agenda of the meeting was set by the centre, based on general guidelines including presentation of the centre and meetings with key actors in the centre. The centres selected a few thematic focuses for discussion, for instance centre leadership, exit strategy, student engagement. The centres were invited to suggest external experts for the visit.

The site visit experts were selected based on the following criteria:

- Knowledge of the field or related field/academic environments or focus for the site visit
- Expertise in education development
- Professor competence or similar level of experience

1.2 Key findings from the institutional visits

The site visit experts have pointed to several common key areas that are important for the success among the visited centres.

- **Partners and organization of the centres.** The experts all highlight that the centres have been successful in including groups and actors and suggest

including more groups to help the centre achieving its aims. For instance, Engage is noted for having gathered perspectives from various experts in the field of entrepreneurship through activities such as workshops.

- **Prioritizing resources.** The centres are awarded funding based on the centre plan, however, to achieve their overall goals, the plan might need to be adjusted. Several potential avenues can be pursued, and selecting the most effective activities and prioritizing resources is a complex task. According to the feedback given to CCSE, the priorities that the centre has made seem to be well thought out and adjusted to achieve the overall aims of the centre. Despite the many priorities, there are clear signs that these choices are effectively supporting the centre in achieving its goals.
- **Idea and relevance.** In all innovation projects a good idea is needed, however, to keep a long-standing project going for ten years these ideas might need adjustments. Excited is found to be highly relevant to ICT education by the site visit expert. This relevance has also been a result of the collaboration with important stakeholders and support of common goals. Engage's original idea to focus more on recruitment has been largely abandoned in favour of retention and quality in existing educational offering, which is an adjustment of the vision of the centre.
- **Ownership of the exit strategy.** As the funding period draws to a close, the centres prepare together with the host institution activities and projects that will be sustained beyond the funding period. This decision-making process involves a comprehensive evaluation, considering factors such as the value-added by the activity vs costs. As the centre's organisational unit concludes, the responsibility for continuation transitions chiefly to the respective institutions. In this process unclear anchoring to the institutional and academic community poses a significant risk factor. Institutional ownership of the exit strategy is therefore of decisive importance.

2 CCSE - Centre for Computing in Science Education

Michael E. Caspersen

The vision for the Center for Computing in Science Education (CCSE) is to be recognised as a local, national, and international hub for research-based integration of computational methods in education.

The Center for Computing in Science Education (CCSE) works systematically, goal-oriented and with great effort to achieve its clear and ambitious goals:

1. Develop a research-based foundation for the integration of computing into basic education and to become an international hub for this activity;
2. Lead research-based development of new learning materials, methods and practices;
3. Study the effects of the new learning materials, methods and practices, in particular how they transform the culture for teaching and learning;
4. Involve students deeply in the development of new practices and methods;
5. Disseminate and adapt the practices and results across disciplines in collaboration with key partners.

To match these five goals, CCSE has from early on established five development areas¹, each with a senior leader².

In the mid-term evaluation of four Centres for Excellence in Education in 2020³, it was recognised that:

- CCSE's management structure is well thought out;
- CCSE is well integrated into the wider organisation;
- CCSE is strongly supported through highly competitive grants;
- CCSE is well on the way to fulfil all of its five goals.

All of these are confirmed by the present evaluation.

¹ See [Development areas we are working with](#) @ the CCSE website

² See [Work package leaders under People](#) @ the CCSE website

³ [Mid-term evaluation of 2016 Centres for Excellence in Education](#), report no. 7, Norwegian Agency for International Cooperation and Quality Enhancement in Higher Education, 2020.

In addition, the mid-term evaluation recognised that CCSE has the potential to become truly world leading – to go from good to great – but that this ambition was not necessarily reflected in the centre plans for the second round, which it should be.

Recent initiatives and derived opportunities indicate that CCSE has taken this advice seriously:

- Intensified collaboration with strong international communities in physics education research:
 - Michigan State University (to which there is a particularly strong relation due to one of the CCSE leaders' co-affiliation);
 - University of Colorado Boulder (where Nobel Laureate Carl Wieman almost twenty years ago initiated the Science Education Initiative and a strong tradition for physics education research and development);
 - Oregon State University.
- Collaboration through international platforms for educational and research partnerships, e.g. the university networks [Circle U.](#) and [The Guild](#);
- Organisation of the [Nordic Regional Learning Assistant Workshop](#) – a two day workshop in June 2022 with facilitators from University of Colorado Boulder and participants from the Nordic countries;
- Organisation of [the Oslo Physics Education Research Summer Institute 2022](#) – a week-long workshop for physics education research groups from the three US universities mentioned above as well as Scandinavian physics education research colleagues;
- A chapter – Physics computational literacy: what, why, and how? – in [The International Handbook of Physics Education Research: Learning Physics, 2023](#);
- Two incoming Fulbright Fellows and a visiting researcher
 - Associate Professor Ben Zwickl, Rochester Institute of Technology: Physics education research (2022);
 - Professor Gerald Feldman, George Washington University: Active learning (2023);
 - Senior Lecturer Jan-Fredrik Olsen, Lund University: Mathematics education research (2023–2026).
- An upcoming invited review article on computational literacy in physics for the prestigious journal [Nature Physics](#) – a clear indication of the status the centre has achieved in the international community.

In the past three years, CCSE has indeed pursued the opportunity to go "from good to great" and become truly world leading.

This development is recognised by the university. The consideration is that CCSE have had more influence than they might know. CCSE was an early initiator of computational methods in science education. Over time, arguments have gained power, also in research. CCSE is not the only driver, but an important driver for the development – also to influence politics at the international level.

For very good reasons, CCSE is considered a global lighthouse when it comes to research-based development and implementation of computational methods in study programmes at undergraduate as well as graduate level – particularly in the domain of physics education.

2.1 What are the strengths that the centre draws on in achieving its goals?

CCSE draws on several strengths related to internal factors, organisation, and priorities.

2.1.1 Internal factors

First and foremost, the strength of CCSE is the people in and around the centre. The "founding fathers" and key people of the centre are physicists; thus, physics education research and development is the source from where the centre's activities spring.

The five leaders involved in the centre possess a rare combination of

- strong academic merits
- theoretical as well as research- and experience-based knowledge about education
- deep knowledge about and ambitious visions for computational literacy as a driver for disciplinary renewal
- strong management and communication skills
- bridge-building abilities (for lack of a better word)

When all this comes together and is brought forward with a genuine and appreciative interest in collaboration with others who are experts in the various fields, good things are bound to happen.

In short: people matter. At the same time, this is the essential strength but also a potential weakness of the centre.

2.1.2 Organisation

As pointed out in the mid-term evaluation in 2020, CCSE's management structure is well thought out and with strong leaders in all five development areas:

- Research-based development of methods and approaches
- Research-based development of learning material
- Development of a culture for teaching and learning
- Development of student-driven activities
- Dissemination, dialogue, and communication

The goals of the centre are reflected in these five areas, which all are managed by senior leaders. This is a second strength of the centre, but it will be a key challenge to maintain this at the same time broad and deep focus of the centres activities when the funding period ends.

2.1.3 Priorities

CCSE has made some key priorities for their modus operandi.

Inside-out and depth-first

The essential priority of CCSE has been to work "inside out" and "depth-first", i.e. to initially implement high-quality computational materials and methods at the bachelor level in physics.

With first year physics as a solid foundation as well as a convincing and inspiring role-model, the centre activities has gradually spread to other study programmes in the natural sciences, at other faculties and at other educational levels before or after the bachelor level (K-12 as well as graduate programmes at master and PhD level). And eventually gradually disseminating materials and methods to other universities in (Southern) Norway.

The "inside-out" and "depth-first" approach has proven to be a highly successful strategy.

A strong educational research group

Since its beginning, the centre has been and continues to be successful in recruiting international (visiting) researchers, including Fulbright Fellows in strategic focus areas (see details above in part 1).

Research-based development of materials, methods, and approaches

CCSE has prioritised to develop and maintain a multitude of research-based teaching materials⁴.

Complementary to the development of teaching materials, the centre conducts research-based development of teaching methods and approaches⁵.

Research-based materials as well as methods and approaches are the bread and butter of the centre's activities and essential for its success.

Build and maintain a culture for teaching and learning

CCSE works holistically – in several diverse and complementary areas – to establish and maintain a strong and viable culture for teaching and learning⁶.

This is an important aspect of all (university) education, and it is commendable that CCSE is also addressing this. However, it is not strictly tied to the centre's overarching goal of advancing computational methods in (science) education.

Student-driven activities

CCSE is also focused on engaging students as partners at all levels of the educational reform⁷.

This is utterly important; students are the future, and it is essential to prioritise and support student-driven activities around the core activities of the centre.

Network collaboration with "co-suppliers"

CCSE takes advantage of strong network collaboration within the university with many different but relevant types of expertise. The centre has established collaboration with people with educational expertise from other faculties, centres, and departments at University of Oslo including Faculty of Educational Sciences, Centre for Educational Measurement, and Department of Teacher Education and School Research.

⁴ See [Research-based development of teaching material](#) @ the CCSE website

⁵ See [Research-based development of methods and approaches](#) @ the CCSE website

⁶ See [A culture for teaching and learning](#) @ the CCSE website

⁷ See [Student-driven activities](#) @ the CCSE website

This is exemplary, but again it will be a challenge to maintain this broad collaboration after the funding period ends. On the other hand, this is an opportunity to join forces by forming new organisational structures or to establish structures that can facilitate continued development of a culture of collaboration.

2.1.4 Dissemination nationally and internationally

The success of the centre depends on its ability to transform and transmit its practices to other fields and institutions, locally, nationally, and internationally. Early, the centre developed a dissemination plan based on research into how to best disseminate and spread excellent practices⁸.

Local dissemination is realised as extensions to new programs at the University of Oslo; this work is carefully organised through partnerships, typically through a four-stage approach:

- Develop plans with leadership and senior faculty
- Competent PhD students develop new materials and approaches in collaboration with seniors
- Pilot courses are tested with students and adjusted and integrated into regular courses by faculty
- Regularly investigate and adjust approaches – and evaluate and review with leadership.

The seven priorities outlined above reflect the ambitious goals of the centre and how the centre draws on its strengths to ensure high quality in all activities. Together with the internal factors and the management aspect, they have been essential for CCSE to reach its goals.

But what are the ambitions for the future when the funding period ends? Is it the goal to maintain the status and level of operation that has been achieved. Is it the goal to enhance it even further? Or is it the goal to settle with less ambitious goals and a reduced scope of activities?

Either way, on the forward it will be crucial to ensure alignment between goals and means of the centre.

⁸ See [Dissemination, dialogue and communication through partnerships](#) @ the CCSE website

2.2 What possible challenges does the centre face in realizing its goals?

The centre is very successful in achieving its goals.

The main challenge is to maintain the impact when the centre ceases to exist, when the special funding is no longer available, and when status and the derived visibility as National Centre of Excellence ends.

CCSE management as well as management at faculty and university level are well aware of this. They recognise that universities are conservative structures. In many situations, this is not only a good thing but a distinct quality. However, a downside is that conservative structures easily kill innovation. Therefore, special measures need to be taken in order to ensure continued development of computational methods in education across the University of Oslo and beyond.

As a first step, it has been decided to merge CCSE with [KURT – Centre for Teaching and Learning in Science](#).

One consideration is to try to create networks among the various Centres of Excellence located at University of Oslo. This may create a significant critical mass of people, but in order to be viable in the long term, it is essential that the people in the network have a sense of unity and common goal. Whether that will be possible depends on the similarity of the goals of the centres.

A radical model might be to mimic an initiative like the [MIT Schwartzman College of Computing](#) and their [Common Ground for Computing Education](#) initiative (adapted to the context of UiO).

Globally, there is an emerging trend to embrace computational methods and digital competences – including artificial intelligence – in all areas of research and education. From the humanities over social science, life science, natural science to engineering, computational methods are increasingly embraced not just as a tool but as an orderly, formal framework and exploratory apparatus for research and education.

With CCSE, University of Oslo is at the global forefront of developing educational materials and methods based on a computational approach integrated with other and more traditional approaches.

Consequently, University of Oslo has a unique opportunity not just to stay at the forefront by continuing the efforts of CCSE, but eventually to apply computational literacy as a driver for disciplinary renewal in all areas of the university. It is recommended that the university seize this unique, cross-cutting opportunity.

2.3 What are the centres main contributions to quality development in higher education?

CCSE's main contributions to quality development in higher education, that other institutions, national and international, can learn from are:

- Research-based methods and approaches for developing and integrating computational literacy in (science) subjects – primarily in higher education, but to some extent also in upper secondary education;
- High-quality and research-based teaching and learning material for a broad range of (science) subjects, both in higher and secondary education;
- Exemplary approaches for developing student-driven activities; and
- Documentation of the achievements (approach and effect) in prestigious scientific publications.

Overall, the achievements of the centre are impressive; but even more so due to the high societal relevance of equipping graduates in all disciplines with strong digital skills, particularly with respect to computational methods.

What opportunities and obstacles do you see in the centres efforts to support other academic communities to adopt knowledge and practices developed by the centre?

Opportunities

CCSE is more than well on the way and with establishing

- a strong, coherent, and experienced educational research group (people);
- a structured and research-based approach to development (materials and methods);

- an increasing portfolio of exemplary cases from different fields (a strong track record of materials, methods and transformed courses/programmes); and
- a solid student base, primarily in physics (computational natives)

Obstacles

The potential obstacles identified relates to the centre's future:

- There is no clear exit strategy for the centre;
- The ideas for future organisation of the centre's activities implies a risk of fragmentation; and
- Distribution of activities may imply lack of critical mass, which may result in degradation of the exceptionally strong position which has been achieved by the centre.

It is not clear who has the responsibility for formulating the exit strategy. It is recommended that all stakeholders (the central university management, the Board of CCSE and representatives from CCSE's management team) join forces in formulating an exit strategy. A complete exit strategy is not only about people but should also address issues related to structures and culture; this is essential to ensure continued viability of the activities.

There are considerations to distribute current CCSE activities to [KURT – Centre for Teaching and Learning in Science](#) and Department of Physics. While there are obvious immediate reasons these considerations, it may be relevant to consider these in light of the aforementioned potential obstacles.

2.4 Summary and advice going forward

For the remaining period of CCSE as a national Centre for Excellence in Education it is recommended that the centre and relevant stakeholders at University of Oslo consider the following key points:

1. Formulate an explicit exit strategy for CCSE.
2. Continue to strengthen the centre's activities and disseminate results both nationally and internationally.
3. Seize the unique and timely opportunity by building on the foundation of Center for Computing in Science Education.

- With CCSE, University of Oslo is at the global forefront of developing educational materials and methods based on a computational approach integrated with other and more traditional approaches to teaching and learning in higher education.
- Consequently, University of Oslo has a unique opportunity not just to stay at the forefront by continuing the efforts of CCSE, but eventually to apply computational literacy as a driver for disciplinary renewal in all areas of the university.
- It is recommended that the university seize this unique, cross-cutting opportunity.

3 Engage – Centre for Engaged Education through Entrepreneurship

Inger Beate Pettersen

Engage – Centre for Engaged Education through Entrepreneurship – is based on a clear vision: to develop learning initiatives in higher education to increase the number of students with entrepreneurial skills and mindset to become change agents for the better. Crafting the new centre plan for 2022 –2026, Engage reorganized into three interrelated focus areas: students, education, and research, with the aim to enhance cross-centre activities and to limit the silo-experience. Additionally, there is a commitment to integrate sustainability across all focus areas, although this convergence is to be developed further.

The first focus area, *Students*, has been implemented through continuous and numerous extra-curricular activities, developing students' entrepreneurial mindsets and competences creating a dynamic and interconnected student-driven ecosystem, with the underlying pedagogical philosophy labelled the 'invisible hand'. *Students* are facilitated by and contribute to their entrepreneurial ecosystem, igniting the student mindset and culture, assuming ownership for activities and for spreading the student culture.

The second focus area, *Education*, implies the enabling of educators to use new educational approaches, methods, tools and learning places, across a broad range of disciplines and higher education contexts. Moreover, entrepreneurial learning methods have been carefully translated and adapted to other disciplines, such as health, music and arts. This goal has been realized through e.g., train-the-trainer modules, teaching resources, such as videos and exercises, and supporting network for educators outside of entrepreneurship programs.

The third focus area, *Research*, suggests further development of research activities, including conducting robust, longitudinal studies, process, and experimental studies, as well as collaborations with researchers in other disciplines, like health, tech and arts. This intended development of research activities is promising. Additionally, Engage has mobilized, shared and advanced research activities through conference participation, workshops with international scholars, book projects, and PhD courses.

3.1 What are the strengths that the Centre draws on in achieving its goals?

The study program Experts in Team (EiT) and the associated Academic section for Experts in Teamworks, and NTNU School of Entrepreneurship (NSE) were firmly established before the launch of Engage in 2016, underscoring NTNU's deep commitment to establish educational programs within this field, and willingness to allocate the necessary resources. These two programs already have a high reputation nationally and have seen further enhancement through Engage's activities. Nord University (especially HHN) is also experienced and a pioneer in providing high quality entrepreneurship education at all levels.

The increased research capacity enabled through Engage has documented the short and long-term effects of the innovative learning methods implemented in diverse study programs and have provided valuable knowledge for educators – further enhancing the quality of study programs and pedagogical methods.

The partnership with Nord University Business School has proven effective in developing and strengthening research activities within the Centre. Collaborative efforts encompass organizing workshops, conferences, and book projects, drawing on joint research strengths and the extensive experience and track-record of entrepreneurship research at Nord.

NTNU has long fostered student-driven initiatives, e.g., through Spark*NTNU, to cultivate student engagement, fostering a dynamic and interconnected student ecosystem. The momentum gained in this regard has been further propelled and solidified through Engage.

Hence, NTNU and Nord University in partnership, are strategically positioned to leverage their well-established educational programs and vibrant student ecosystems, strengthened through SFU Engage, sharing their experience and competence to other institutions.

Furthermore, the Centre's activities and heightened research capacity in the field have increased NTNU and Nord University's attractiveness and academic standing in the field of entrepreneurship education and research, both nationally and internationally. This enhanced position has facilitated collaborations with national and international partners, engaging in sharing and interactive learning

through workshops, forums, networks, and conferences, thereby further developing the Centre's activities.

3.2 What possible challenges does the Centre face in realizing its goals?

The organizational structure of the Centre is built around three focus areas, Students, Education and Research. The inherent challenge lies in seamlessly connecting people (the core teams) and activities, to prevent the formation of silos. Complicating matters, Engage is a collaboration between two very different universities, each with their own research milieus, regional contexts, and student populations. Hence, the challenge to collaborate across institutions and regions adds to the complexities of bridging core focus areas, core teams and activities. This challenge will most likely increase after the HK-dir funding period.

NTNU and Nord University Engage have through the centre activities built and strengthened research knowledge related to entrepreneurship education with a focus on VCP research, university ecosystems, student entrepreneurship, venture teams, and interdisciplinary entrepreneurship education. Yet, it seems the major research capacity has been built through PhD-students, as the Centre has allocated many PhD-positions dedicated to conduct research in the field of entrepreneurship education. Some PhD candidates have progressed to secure permanent associate professor positions, ensuring the research capacity within the institution. Nevertheless, it is opportune to ascertain whether entrepreneurship education research has evolved into a primary or attractive research field among faculty, or if continuous research in education hinges on the creation of new PhD-positions. And it is timely to ask if the institution is committed to dedicate research funding to this field after the HK-dir funding period, in a future where economic resources generally will be scarce for all universities.

3.3 What are the Centres main contributions to quality development in higher education?

The Centre has, through the three focus areas, contributed to build and strengthen quality in higher education outside the Engage core milieus at NTNU and Nord. The core study programs and extra-curricular activities for students

were initially related to entrepreneurship education. Yet, during the centre period, Engage has shared/transferred pedagogic designs, entrepreneurial learning methods and entrepreneurship education elements to other study programs at NTNU and Nord. Notably, through Train the trainer modules for faculty, EVU courses, entrepreneurship and innovation to health disciplines, entrepreneurship in PhD-programs and the establishment of the Venture Creation Program Fiver at Nord. The transfer of entrepreneurial learning elements to other disciplines and institutions has not been straightforward and Engage has used time and resources to enable successful learning transfers, cognizant of inherent differences across disciplines.

NTNU and Nord has also used Engage to share acquired competence and experience with other national and international universities, through diverse workshops, forums, networks, and collaborations, contributing to heighten quality in higher education nationally and internationally.

The Centre and its network of academics, postdocs, researchers, and PhD-students have actively participated at international conferences within the field of entrepreneurship education and research. This participation not only facilitates the learning and dissemination of research knowledge derived from Engage but also contributes to the creation of new research networks in the academic landscape.

3.4 What opportunities and obstacles do you see in the Centre's efforts to support other academic communities to adopt knowledge and practices developed by the Centre?

Engage has defined a broad vision and goal: *We work to increase the number of students in Norway and around the world with entrepreneurial skills and the mindset to become change agents for the better.* This broad vision is generous towards other academic communities and highlights the Centre's willingness to share and engage with others. However, sharing and supporting activities inherently demands resources, be it time, personnel, or financial investments. It is imperative to prioritize and narrow down activities, especially after the HK-dir funding period.

There is a pressing need to delineate how the Centre can focus its engagement and activities. Engaging in national and international collaborations demands substantial resources and without the Centre's funding, comprehensive efforts in project acquisition is required to establish new networks/collaborations and to maintain established networks/collaborations.

The facilitation resources that have been financed by the Centre, to nurture the many networks and collaborations, will need financing from alternate sources, whether internal or external project funding. It will present a challenge for faculty members to be highly involved in multiple collaborations and networks, given that these activities extend beyond the conventional realms of teaching and research, financed by the institutions.

3.5 Summary and advice going forward

- In the continued operation of the Centre, the challenge of silos, particularly between education and research poses a continual threat, even though the Centre has implemented improved systems and cultures to prevent silos. With limited resources to recruit PhD-candidates after the HK-dir funding period, a recommendation is to spread and internalize the interest and capacity to conduct research on education across disciplines and faculties.
- To ensure continued advancement in the research field of entrepreneurship education at the Centre institutions, it is recommended to anchor this research field at the institutional level, allocating financial resources to recruit new PhD-candidates and to offer associate professor positions dedicated to entrepreneurship education research.
- It is recommended to prioritize and rationalize national and international networks and collaborations in the future. Networks and collaborations need to be anchored at the institutional level and with the necessary financial resources required to maintain them.

4 Excited – Centre for Excellent IT Education

Mats Daniels

The centre has divided the work in three clusters: C1 – Learning outcomes and structure, C2 – Pedagogy in IT education, and C3 – Tools and infrastructure. These are all essential components in reaching the goals for Excited. There were examples of activities in all the clusters at the meeting and the activities were clearly relevant. Some of the examples are described below and they were relevant for the goals. The division into clusters help in the identification of desirable activities. The organization of the centre seems well thought out and functioning with regard to the coordination the activities in the centre.

4.1 What are the strengths that the centre draws on in achieving its goals?

The centre has managed to attract persons with high competence and high ambitions, which I think is a crucial factor for success. This is however not enough, even if it is a requirement in my opinion. The organization of activities and the general structure seems constructive and with clear goals. The fact that there is funding for activities and that the activities are visible is essential for the centre. The visibility of being a centre seems to me to has been an important factor in attracting people to be part of the activities.

The grouping of activities in clusters has been helpful in identifying (for outsiders) where to “look” for relevant information about what is done in the centre, as well as (for insiders) to be clear about the context they work in. I see the organization in clusters as an important part in creating “identity” for subgroups. The latter can be problematic, since there is a risk of creating “silos”, but the leaders seem to be aware of that and discussed how to also work on overarching goals, which would connect the work in the clusters.

To be a centre is an opportunity, and it seems like the centre shas succeeded to be well connected both internally and externally. This is a major strength of Excited as I see it.

4.2 What possible challenges does the centre face in realizing its goals?

One challenge is *time*, even with funding that allows for providing people with time. The people involved are, as I understand it, active persons with many other obligations. To have such persons is important, since it is vital to have people who are integrated in the organization. A challenge is to find a balance between involvement in the centre and other activities. A good balance can be essential in reaching out with results from the centre, that is to build on key persons (both key in Excited and key on the organization).

A similar, and perhaps even greater challenge, is the lack of *time* the receivers of the results from the centre have. To some degree this can be dealt with by having joint activities, and it is something the centre is addressing, for instance in the mini-projects.

The discourse in discipline-based education research is for many new, and the outreach can thus be problematic. The area itself is in fast development and to keep up is a challenge for all, not least for the persons in the centre. There is thus a challenge to be updated on results in the area that are relevant for the running of the centre. The keeping up with the research area and developments in enhancing educational practice will be a main challenge for Excited beyond the HK-dir funding period. This is a main challenge, since it is important that much of the work in Excited should be continued.

To integrate findings and observations in the three clusters to find overarching issues, was presented as an ambition. This is, in my opinion, important and not an easy endeavor. The people in Excited seem competent enough to strive for this to happen.

Something related to the above is the challenge to work at different levels. For instance, the mini-projects can reach people at the grass root level, but how is this anchored at higher levels of the institutions where those working in the project are employed? In my experience there are often challenges to reach levels from the grass root level up to overarching decision makers at institutions, or even higher up at the national arena. The visit was too short to get an insight into how this challenge is met, but since it is such a challenge, I'm sure it is something to consider.

4.3 What are the centres main contributions to quality development in higher education?

There are several aspects where Excited contributes to quality enhancement in higher education. The anchoring in educational research is a major factor in ensuring quality that Excited brings. The presentations from PhD students and post-doctors were interesting and impressive, and indicates high quality contributions.

The LUR-project is a good example how Excited has an approach that influence the education in an educational theory founded manner. An introductory IT course was presented and interventions were described, which can serve as "blue-print" for similar courses.

A demonstration of tools used to study student behaviour in learning situations, especially related to use of games. This was quite impressive and shows clear potential to being useful in education. This work will serve as a foundation for collaboration and presentations at conferences and meetings that should enhance quality development of higher education.

The mini-projects presented illustrate another way to enhance quality in education, where teachers/educators can get help and funding for educational development projects. This will inspire a wider community to engage in educational development and will serve as an effective form of disseminating information and good practice.

4.4 What opportunities and obstacles do you see in the centres efforts to support other academic communities to adopt knowledge and practices developed by the centre?

One unfortunate obstacle is lack of time at other academic communities, where the mini-projects can be an opportunity. The mini-projects are also good for dealing with the *not-invented-here* obstacle. That is, the problem with solutions and recommendations not being fully aligned with the local practices or context. The fact that Excited is recognized as a having high quality helps in their efforts to support other academic communities. Their effort to be clear about the areas they are working in, the clusters, is also helpful in reaching out. This said, it is still problematic to reach out with support. Excited strive to be clear in what they do, but the discipline-based education research area is relatively new and the

discourse about results and issues can be an obstacle for people outside the area. Activities in Excited, such as courses, mini-projects, publications, tools, interactions with students are all routes to bridging this gap.

Looking from the perspective from my research group, Uppsala Computing Education Research Group (UpCERG), I have the impression that Excited is doing excellent work. This is mostly seen from personal contacts, from being invited as mentors in summer schools, participants in events, in grading committees, this assignment, and also having an Excited PhD student visiting for a couple of months. Contacts that are strengthen when meeting at conferences. These contacts have made the work in Excited visible and discussions have influenced us in our work, as well as in the other direction.

4.5 Summary and advice going forward

- Building something that is sustainable after the funding of the centre.
- Build and maintain a network of educators and researchers, both local, national and international.
- Continue to disseminate results and observations made in Excited.