Bergen, 24. sept. 2010

Department of Education

Søknad om såkornmidlar til forskingsgruppa Digital Learning Communities (DLC).

Eg oversender med dette søknad om såkornsmidlar til forskingsgruppa *Digital Learning Communities.*

Med vennleg helsing

Rune Krumsvik
Professor i pedagogikk
Forskingsgruppeleiar

Application "Såkornmidler"

Research group: Digital Learning Communities

Introduction

The research group *Digital Learning Communities* was established in 2007 as a sub-group within *Productive Learning Practise* (PLP), and it is headed by Professor Rune Krumsvik. In 2007, the group had no financial support and only a few members: 1 associate professor, 1 assistant professor and three PhD-students. Nevertheless, the unifying element for all the members of the group was ICT and learning. Four strategic areas were outlined in 2007: 1. Facilitate (and support) PhD-students' effort to complete their PhD, 2. Building research networks, 3. Apply for funding 4. Focus on publishing in international journals. Even if the establishment of DLC has not been a "walk in the park" during the period 2007-2010, there is reason to claim that the group has succeeded with its strategy: Two of three PhD-students in the group has completed their PhD, the group has been able to build sustainable research networks internationally, DLC has applied and received financial support from Bergen Universitetsfond, SmåForsk, PEK and Ministry of Education, and finally, the group has had a good publication rate during these years. As an example of the latter, the group published in 2009 an international anthology, *Learning in the Network Society and Digitized School,* with contributions from leading edge researchers within ICT and Learning from USA, Great Britain, Sweden and Norway. This kind of network building has led to several side effects: e.g. the head of the group was invited to host an editorship for a special issue in the scientific journal *Education, Pedagogy* and *Technology,* he was also invited to give keynotes in several countries, and the awareness of DLC's research on ICT and learning has improved internationally. This again, has resulted in a significantly higher publishing frequency within DLC, and when PLP in 2008 received the publication award from the Faculty of Psychology – DLC produced app. 50% of the publication points this particular year. Over the past year of PLP, DLC continued to achieve new milestones. The PLP Report 2009-2010 documents this development (see attached report, att. 1).

Today, the group has a national (and partly internationally) position within the area of ICT and learning. It has expanded, and all the members are involved in ongoing research on pedagogy, focusing in particular on ICT and learning in higher education, in teacher education

and in school. The research group consists of both pedagogues and psychologists with high quantitative and qualitative competencies, which provide new opportunities and possibilities to design and study learning with ICT in different contexts. In several of the thematic areas and subprojects (described below), research questions centre on how ICT influences, challenges and changes traditional educational activities and learning processes. The group aims to have an international profile, and e.g. one of the group members are referee in 6 international scientific journals (three of these on level 2), another one is referee in six international scientific journals (two of these on level 2) and several of the other primary members are regularly referee in 1-2 international scientific journals. This, combined with invited keynotes and a good publication rate in DLC, are examples which illustrate that the group's strategy has been fruitful so far.

Thematic areas

The thematic areas of DLC will first be described briefly below and then more in detail later in the application.

1. **ICT and learning outcome for university students**

   This thematic area has a special focus towards university students and their learning outcome when ICT is an integrated part of their learning process.

2. **ICT and learning strategies in upper secondary school**

   This thematic area has a special focus towards class management in upper secondary school and students' learning strategies when ICT is an integrated part of the learning process.

3. **ICT, digital competence and ethics in teacher education**

   This thematic area has a special focus towards teacher educators' digital competence, the use of social media and ethics within teacher education.

These thematic areas are attached to the following statements from the *Faculty of Psychology's Strategy Plan 2007-2010:*

"Three programs will be prioritized; "Psychology (Profesjonsstudiet"), teacher education and university pedagogy.

"For both teacher education and university pedagogy, there is a special focus on facilitating for increased research".

"The faculty will:

- Strengthen the international anchoring and research within teacher education, and specifically within pedagogy to promote research based teaching

- In addition, the faculty has ambitions to develop a graduate school of research within pedagogy in collaboration with university colleges".

The thematic areas are also attached to the findings in the Norwegian Research Council's evaluation of Norwegian educational research in 2003/2004. Among the criticism raised in this report is that Norwegian educational research seems fragmented, have to little focus on publishing in international journals, have weak research leadership and lack competence within quantitative and Mixed Method design. In 2006, a follow-up report of this evaluation was published by the NFR. This report recommended building international networks, establishing thematic research groups, focusing on international publications, and practise relevant research studies as remedial actions. *Digital Learning Communities* intends to address the above points of criticism through initiating and performing research highly relevant for the educational area, participating in international research cooperation, publishing internationally, applying quantitative designs and finally by supporting PhD-candidates.

DLC (contributes today and) will continue to contribute in offering courses within the PhD-programme, the national graduate schools of research NATED and NAFOL, as well as follow up the graduate school research WNGER (2007-2010) through a professorship, professor II at University college Stord/Haugesund (head of the research group is holding this position in the period 2010-2013).

Permanent scientific staff with primary attachment to the group:

1. Professor Rune Krumsvik (Head)
2. Ass. professor Ingrid Helleve
3. Ass. professor Elisabeth Norman
4. Ass. professor Bjarte R. Furnes

Doctoral, secondary - and temporary staff connected to the group:

5. Ass. professor Brita Bjørkelo
6. PhD-student Rune Herheim
7. PhD-student Morten K. Pedersen
8. PhD-student Vigdis Vangsnes
9. PhD-student Petter Kongsgården
10. Associate professor Hege E. Tjomsland

11. Assistant professor Helga Myrseth
12. Asociate professor Aslaug G. Almås
13. Associate professor Kariane Westrheim
14. Scientific assistant Kristine Ludvigsen
15. Master-student Reidun Johannesen

The aims of the research leader of DLC are:

- Increase the number of international publications

- Recruit and support PhD and Post-doctoral students

- Contribute to the Faculty's PhD-programme and to the Norwegian graduate schools of research NATED and NAFOL.

- Arrange regular research seminars and workshops with our international collaborators

Framing the research focus in DLC

This application proposes new developments regarding ICT and its implications for both learning and knowledge. The main innovative and unifying elements across the sub-studies are related to ICT-research areas within education which still are under researched both nationally and internationally: A) *Multimodality and learning effect* are accompanied by the use of 3D web-based system in learning tasks of psychology students, B) *Digital competence and learning strategies* aims to explore metacognitive feelings related to learning in situations where learning material is presented either on computer screen or on paper, C) *Ethics, Social media and Teacher Education* aims to understand the role of ethics in the decision to participate in social media as a teacher student, D) *Feedback and ICT in lectures* use innovative hardware to examine student learning in plenary lectures which also have the potential of a high degree of innovation, E) *Empirical testing of a theoretical model of digital competence* focus on testing an innovative model of digital competence which is developed by the head of the research group DLC and published and cited in several international journals. F) *Class management in digital classrooms* (already financially supported by the Ministry of Knowledge) focusing on what kinds of new management strategies teachers ought to develop in light of the large scale implementation of ICT in upper secondary school. In general, the studies have several common characteristics as they all focus on educational innovations as well as the assumption that the underlying premises for teaching and learning are changing both in higher education, schools, and teacher education as a consequence of the implementation of new international standards and the digital revolution. In *higher education* this has become more pressing as a result of the Bologna process (1998, 2005, 2007) with the

new grading system (Bachelor/Master's degrees and Diploma Supplement), the European Credit Transfer System (ECTS), The Quality Reform (Ministry of Knowledge, (MOK), 2001), the establishment of the Norwegian Agency for Quality Assurance in Education (NOKUT), The White Paper 16 (MOD 2006) focusing on lifelong learning, Tuning Educational Structures in Europe (Tuning, 2009) and the new Frame Work for Qualifications (MOK, 2010). In *schools,* this has become particularly pressing as a result of the new educational reform 'Knowledge Promotion' (MOK, 2006) whereby digital competence is now the fifth basic competence in all subjects at all levels (stages 1 to13, 6-19-year-olds). Likewise, the digital revolution has consequences for *teacher education*, given that digital competence has been introduced as a fifth basic competence in the new General plan for Teacher Education in Elementary School (MOK, 2010). Norwegian schools are infiltrated with new technology, and the obligatory use of ICT in all subjects questions in many ways both our general perception of 'technology' as an educational term as well as university teachers', teacher educators' and teachers' use of technology in school.

This considerable change in the pedagogical and didactical conditions in Norwegian auditorium and classrooms calls for a more in-depth consideration of how ICT influences 'how teachers teach and learners learn' in the digital era as well as how it is reflected in e.g. the new teacher education. Neither Norway nor other countries have highlighted the ICT challenges which teacher education has been exposed to as a result of the digitisation of society and schools. All of these, demand that both student/pupil curricula in Norway must be more specifically formulated around learning outcomes as well as the use of Information and Communication Technology (ICT) as a tool in teaching and student/pupil learning processes. This also implies a higher awareness towards the increasing diversity e.g. among university students because students who might have previously experienced educational alienation may need innovative ways of learning?. These new educational streams and policy regulations create a situation which both calls for a revitalisation of pedagogy in general and the need to carry out research within this area on a micro level. Thus, the aim of the research group Digital Learning Communities' "Såkorn application" is to carry out solid research studies within these areas and establish a strong focus on epistemology, educational innovation, publishing, external research applications (NFR, EU, etc.) and facilitating PhD-students' work. The main research questions are:

- How is ICT influencing conceptions of learning, teaching and knowledge in universities, teacher education and in school?
- How does multimodality challenge the underlying premises for teaching and learning?

- How do individual differences in reading ability influence metacognition in on-screen versus on-paper learning?
- How do social media influence our perception of pedagogy and ethics in teacher education and in school?

The underpinning for both the aim and the research question is based on the members of the group expert competencies within these research areas, their methodological competence, DLC's collaborative partners, milestones, etc. and below we will describe this in more detail.

Scientific Advisory Committee:

During the last years, *Productive Learning Practise*, have had the following Scientific Advisory Committee:

- Professor Thomas Popkewitz, University of Wisconsin, Madison.
- Professor Rosamund Sutherland, University of Bristol, U.K.
- Professor Donald Christie, University of Strathclyde, Scotland
- Professor Harm Tillema, University of Leiden, The Netherlands

If the faculty intends to prolong all the contracts with the committee members, DLC will support such a solution. If we have to choose some of these committee members, DLC wish to prolong our collaboration with professor Rosamund Sutherland, University of Bristol and professor Donald Christies, University of Strathclyde, Scotland. DLC have also other suggestions to SAC (if it is not possible to prolong the contracts with some of these members above).

Plans for research funding:

- Rune Krumsvik is applying the Norwegian Research Council (programme VERDIKT) 5 million, three years, with Christian Michelsen Research.
- Rune Krumsvik will apply to the Norwegian Research Council (programme Utdanning 2020) 10 million, three years, with University College Stord/Haugesund.
- Rune Krumsvik is applying to the Norwegian Research Council (program: Praksisrettet FOU i lærerutdanningen (approximately 2 million, three years) with University College Stord/Haugesund.

- Rune Krumsvik is applying to WUN, with University of Bristol and University of Dortmund (approximately 500 000 annually, 4 years).
- DLC has ambition to develop an EU-application with our collaborative partners at the end of the "Såkorn-period" in 2014.
- Elisabeth Norman will apply Meltzerfondet for a project on the relationship between mood and implicit vs. explicit learning, with collaborators at the Université Libre de Bruxelles.

International Networks

Members of *Digital Learning Communities* participate in various international networks, and the group intends in particular to strengthen the relationship with the following strategic partners over the next three years:

DLC is a member of *The International Federation for Information Processing (IFIP)* which is an umbrella organization for national societies working in the field of information technology. IFIP was established in 1960 under the auspices of UNESCO originally under the name International Federation of Information Processing Societies (IFIPS). Several of DLC's collaborators within IFIP are highly profiled internationally researchers within ICT and learning.

NORDITEL: Nordic governments have in the last five years set out ambitious objectives in the field of Technology, Education and Learning (TEL) by launching various programs regarding the use of information and communication technologies (ICT) in education. Based on previous experiences, NORDITEL has identified the need to complement the different national efforts with a coherent Nordic strategy in order to be able to keep the position as one of the leading world regions in the field of TEL. Head of the research group DLC was in august 2010 invited to lead a session and present a paper at the first NORDITEL symposium. Prof. Barbara Wasson, UoB, was the other represent from UoB. DLC will follow up our engagement in NODITEL and develop a collaborative research network between the University of Bergen, InterMedia/Prof. Wasson and the other universities in the network.

DLC will apply for educational research Within Worldwide Universities Network (WUN): A collaborative research network between the University of Bergen, the University of Bristol,

the University of Dortmund and the University of Griffith, Australia. This network will bring together researchers focusing on ICT and learning.

Collaborative partners:

- IFIP-researchers
- Christian Michelsen Research
- NORDITEL
- InterMedia, UoB
- Bristol University, England
- University of Dortmund, Germany
- Griffith University, Australia
- Prof. Bridget Somekh, University of Manchester
- Prof. Axel Cleeremans, Université Libre de Bruxelles, Belgium
- Prof. Zoltan Dienes, University of Sussex, UK
- Dr. Ryan Scott, University of Sussex, UK
- Dr. Simon Duff, University of Liverpool, UK
- Dr. Michael Schulte-Mecklenbeck, Nestlé Research Centre, Lausanne, Switzerland

Plans for research training and the group's contribution to the Faculty PhD-programme, graduate schools of educational research:

DLC has contributed the last three years to the PhD-courses within Vest-Norsk Nettverk (headed by prof. Bente Wold), WNGER and GHIG. The courses DLC has offered are in qualitative research methods, publications, literature review, etc. Members of the DLC has also taken part in evaluations of applications for the PhD-programme and will continue with this contribution. Staff from the research group intend to develop this further, and want to actively contribute to the optional part of the PhD-programme. E.g. in the Ethics-course of the PhD-programme in November 2010, DLC will contribute with a course in qualitative methods. DLC will also participate and give courses within NAFOL and NATED in the coming years, and several of the PhD-students in DLC are members in these two national graduate schools of research. DLC has a special focus on how to best facilitate the PhD-students' work and progress. This is visualized in figure 1.
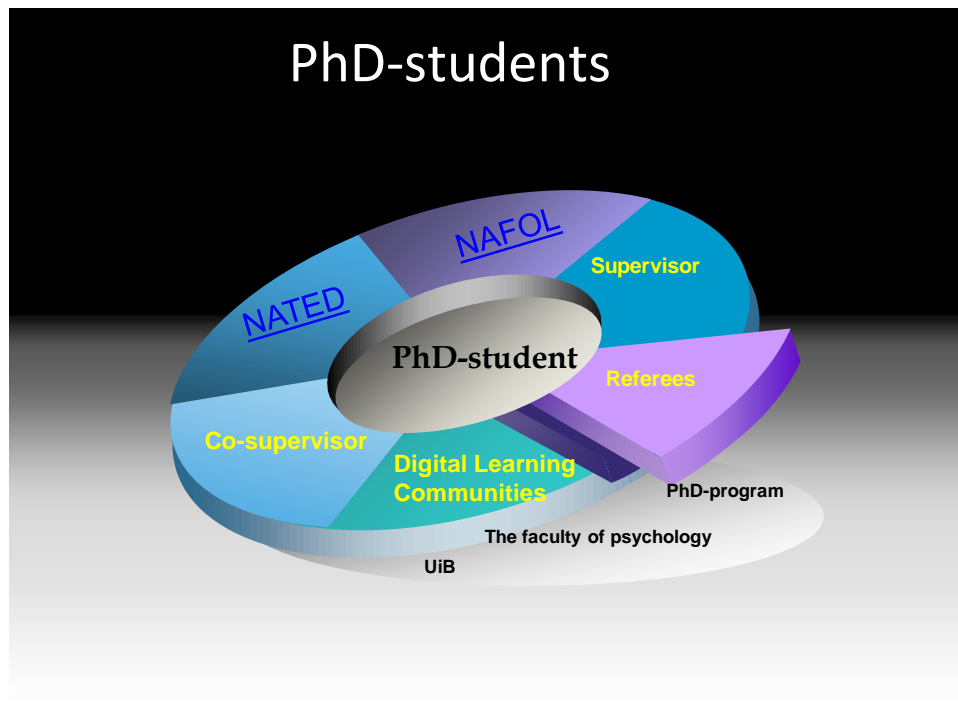
Figure 1. The figure shows the structures that supports the PhD-student within DLC.

As the figure shows, DLC has a high awareness of "collective scaffolding" around each PhD-student. So far (from 2007-2010), our experience with this strategy has been very good. The main point with the figure is to show how each element contributes to the PhD-student's progression and development. A ground pillar in our strategy is that the PhD-students in DLC shall focus on their main assignment: writing their doctoral thesis, participate in international conferences with paper presentations, focus on publishing and completing their PhD-courses.

Research exchange visits

- Professor Rune Krumsvik is one of the main evaluators of the Swedish evaluation of the Swedish Teacher Education in 2010/2011: He has been invited to provide both evaluation and counselling for the rebuilding of the teacher education system in Sweden.

- Professor Rune Krumsvik is one of the experts in a Scientific Advisory Committee for IT in Swedish Teacher Education. This committee evaluates research applications from all the universities and university colleges in Sweden.

- Professor Rune Krumsvik has had research visits to University of Bristol in 2006, 2008, and he plans a new research visit in 2011.

- Professor Rune Krumsvik has been invited to give a keynote at the national conference NU2010 in Stockholm in November 2010.

- Ass. professor Elisabeth Norman was invited to give a guest lecture at Université Libre de Bruxelles, Belgium, in 2010.

- Ass. professor Elisabeth Norman will have a research visit to the University of Sussex, UK, November 2010.

Workshops:

- DLC is hosting a workshop in December 2010 related to our application to the Norwegian Research Council, where DLC and our collaborative partner, Christian Michelsen Research, will invite research partners to critically examine our research proposal before the application deadline.

- DLC is planning to host a workshop for our collaborative partners in NORDITEL in March 2011, where the main focus will be ICT and learning in the Nordic countries

- DLC will arrange a seminar for our collaborative partners at the University of Bristol and the University of Dortmund in August 2011. Intended outcomes of this seminar are joint articles, plans for international symposia at conferences in education research and new research ideas. Also, the cooperation is important for applications for external research funding. A platform for the future collaboration will be established.

- In October 2012, DLC will arrange a seminar on VideoPaper, multimodality and multiliteracy with Prof. Federica Olivero, University of Bristol.

Budget:

Activities	2011		2012		2013	
Project 1	50	50	50	50		
Project 2	50	50				
Project 3			50	50		
Project 4			50	50		
Project 5					50	50
Project 6					50	50
Workshop 1	50					
Workshop 2		50				
Seminar 1					50	
Seminar 2						50

In addition to the budget presented above, the primary members of DLC will use some of their research part of their positions to these research studies. DLC will also apply for PhD-positions in the next coming years and will also use PhD-students to carry out some parts of the studies.

The different sub-studies in DLC

Below is a brief description of our six sub-studies (which are attached to the three thematic areas described above) that will be carried out during the period of "Såkornmidler" 2011-2014.

Project 1: Learning in the digital age: Comparing metacognitive feelings for text material presented on paper, computer screens and electronic reading devices.

Background

Digital competence and learning strategies

With The Knowledge Promotion Reform (Kunnskapsløftet), the ability to use digital tools was introduced as one out of 5 basic skills, and the acquisition of efficient learning strategies was suggested as a central means to increase students' motivation and facilitate lifelong learning. A prerequisite of developing learning strategies is the ability to engage in *metacognition*, i.e., cognition about one's own cognition (Metcalfe, 2000). Therefore, the combined focus on digital competence, learning strategies and lifelong learning necessitates

more knowledge about the relationship between metacognition and learning in a digital context compared to more traditional learning contexts where the learning material is paper-based.

This study will explore metacognition related to learning in situations where learning material is presented either on screen or on paper. We focus on a particular type of metacognition that is likely to play a central role in text comprehension, namely *metacognitive feelings*, which are informative feelings that reflect aspects of ongoing processing, e.g., feelings of comprehension (Efklides, 2001). The function of metacognitive feelings is to monitor ongoing cognition (Koriat, 2007) and to use the output of monitoring to regulate cognitive processes and behaviour - referred to as metacognitive control (Koriat, 2000). An example would be the decision to read the text once more if one felt that comprehension was low.

We find it important to differentiate between *subtypes of digital learning contexts*. Traditional computers and laptops are now being supplemented by electronic reading devices in a range of different arenas, including private homes, schools and universities. For example, the University of Oslo is now offering their geography master students the entire curriculum on Apple's iPad. A central argument for introducing such devices is that they bridge the gap between paper books and on-screen material because they are "closer to paper books with respect to paging, sequential order, mobility and physical weight" (Lemken, 1999, p. 1). Furthermore, it is argued that electronic reading devices support lifelong learning because they facilitate "anytime, anywhere" learning across the life span (Sharples, 2000). However, such claims have not been systematically tested empirically. To date, most research on digital learning compares traditional computer-based with paper-based learning. Moreover, it most often focuses on learning outcomes rather than metacognition**.** Thus, there is a need for more research on the relationship between metacognition and learning in digital versus paper-based contexts, and which differentiates between the two types of digital learning contexts.

We want to explore three aspects of metacognition related to text material presented on paper, computer screens and electronic reading devices:

(1) The phenomenology of metacognitive feelings related to the three types of learning context. Existing research (Ackerman, 2009; Ackerman & Goldsmith, 2008) has reported that learners prefer to print digitalized texts before studying them, and that they feel they remember and understand texts better when they are presented on paper rather than on screen. However, these results are based on survey studies, and details about the underlying phenomenology has not been explored.

(2) Situational variables that might influence the felt ease of learning associated with the two learning contexts. The existing experimental studies in this area (Ackerman, 2009; Ackerman & Goldsmith, 2008) indicate that situational variables influence metacognition differently for on-screen versus on-paper learning. For example, Ackerman and Goldsmith (2008) found that metacognitive accuracy was influenced by available study time. However, other situational variables, including text difficulty, and whether one is allowed to take notes during reading, were not controlled for.

(3) The possible effects of individual differences in reading ability on metacognition for on-screen versus on-paper learning. Research on metacognition in learning suggests that metacomprehension for written text varies as a function of verbal skill (Maki, Shields, Wheeler, & Zacchilli, 2005). Similarly, it has been suggested that metacognitive strategies is a major challenge for people with reading disability (Pressley, 2006; Palinscar & Ransom,

1988), and interventions are often targeted at developing better learning strategies (Nelson & Manset-Williamson, 2006). With the shift from paper-based learning to more computer-based learning in schools and universities it is important to know how the relationship between reading ability and metacognition is influenced by whether the learning material is presented on-paper or on-screen.

Research questions

1. What is the phenomenology of metacognitive feelings related to text material presented on paper, computer screens and electronic reading devices?
2. How do situational variables influence metacognitive feelings and metacognitive accuracy for text material presented on paper, computer screens and electronic reading devices?
3. How do individual differences in reading ability influence metacognitive feelings and metacognitive accuracy for text material presented on paper, computer screens and electronic reading devices?

Design

The project will apply a mixed methods design which involves collecting and analyzing various sources of data in a single study (Creswell, 2003). Such a design implies that what is learned from one method adds to what is learned from other methods. Mixed methods studies are employed when there is a concern both for what is happening as well as for how and why it is happening the way it is (Sosulski & Lawrence, 2008). It is according to Johnson (2004) appropriate when it provides the best opportunity to answer particular research questions. Because this study includes both dynamic, qualitative elements as well as fixed, quantitative elements, a combination of data sources seems like the most appropriate methodological approach.

Creswell (2003) notes that the integration or the "mixing" of data in a mixed methods study may occur at several stages in the research process. In the current research, it will occur both during data collection, data analysis and data interpretation.

Study 1: Reading on computer screens versus on paper: How is the phenomenology and accuracy of metacognitive feelings influenced by situational factors and individual differences in reading ability?

140 participants in the age group 18-25 will be recruited among students in their final high school year (in schools in Bergen) and among undergraduate students at the University of Bergen.

Study 1 consists of two parts.

Part 1 (N=20) is a qualitative study of the phenomenology of metacognitive feelings related to on-screen versus on-paper learning. As follows the recommendations by Teddlie and Yu (2007), the sampling of students will aim to generate a database that include both depth and breadth related to the research questions, in order to provide as much learning as possible regarding the phenomenology of metacognitive feelings related to on-screen versus on-paper learning.

The informants who accept the invitation to participate in the qualitative study will take part in a semi-structured interview focusing on the following topics: (a) How and why on-screen versus on-paper learning feel different, (b) Examples of situations where the informant has experienced this difference, (c) Learning strategies that the informants feel are

efficient for on-screen versus on-paper learning, (d) Situational variables that the informants feel will influence the efficiency of on-screen versus on-paper learning. The qualitative data analysis software package QSR N7 (http://www.qsrinternational.com) will guide the analysis of the qualitative data. The findings from the analysis in Part 1 may influence the choice of independent situational variables included in Part 2.

Part 2 (N=120) is an experimental study of the effect of on-screen versus on-paper presentation on metacognitive feelings and metacognitive accuracy, based on a modified version of Ackmann and Goldsmith's (2008) procedure. Each participant takes part in two learning phases. Initially, they rate their metacognitive knowledge related to the efficiency of learning for on-paper versus on-screen learning. Subsequently, they read each of the two texts for a fixed study time, either on paper or on screen. At regular intervals during reading, participants will be required to give online ratings of their metacognitive feelings related to specific parts of the text. Immediately after each reading phase, they will be asked to give a global prediction of their future performance. In a subsequent test phase their memory of the text will be assessed through a multiple choice test. Dependent variables are the amount of learning, metacognitive calibration, and metacognitive resolution. The possibility of taking notes during the study phase will be a between-subjects variable. Possible effects of individual differences in reading ability will be explored through the inclusion of a measurement of reading (a self-report measure and an objective test of reading skill). Reading ability will be included in the analysis as a covariate.

Study 2: Reading on computer screens versus on electronic reading devices: How is the phenomenology and accuracy of metacognitive feelings influenced by situational factors and individual differences in reading ability?

140 new participants will be recruited from a comparable sample as Study 1. Experience with electronic reading devices will be an inclusion criterion.

Part 1 (N=20) is a qualitative study of the phenomenology of metacognitive feelings related to on-screen learning when the screen is a computer monitor versus an electronic reading device. The procedure and structure of interviews will correspond to Study 1, Part 1.

Part 2 (N=120). The same basic procedure will be used as in Study 1, Part 2, but the main independent variable (within-subjects) will be screen type, i.e., computer monitor versus electronic reading device. Reading ability will be included as a covariate.

Project 2: Ethics, Social media and Teacher Education

This project "Ethics, Social media and Teacher Education" has developed as a result of international collaboration with Monash University, Melbourne, Australia (http://www.monash.edu.au/). The project has its background in the role of digital competence as one of the five basic competencies in the "Knowledge Promotion" (Kunnskapsløftet) (see e.g., Krumsvik, 2009b). The Knowledge Promotion is the ongoing reform within the Norwegian 10-year compulsory school and upper secondary education and training. The reform introduces changes in how digital competencies should be a part of the substance, structure and organization of teaching from the first grade in the 10-year compulsory school to the last grade in upper secondary education and training. Research has shown that the role of the teacher is one of the most vital parts of student academic outcomes (see e.g. Hattie, 2009). Simultaneously, the Norwegian school system prioritises information and communication technologies (ICT) high (Almås & Krumsvik, 2008). The role of digital competence is therefore an essential part of teacher education, as can be illustrated in the Digital literacy model (Krumsvik, 2008, 2009a).

In the same way as teachers are role models in the application of ICT, such as teaching students ritual versus academic use, teachers are also role model in the use of social media in an ethical manner. Some studies have shown how students evaluate the participation of teachers in social media and their level of motivation, affective learning and classroom climate (see e.g., Mazer, Murphy, & Simonds, 2009). Few if any studies have however investigated the role of ethical reasoning among teacher students and their actual participation in social media. One pilot project has been conducted in Australia among teacher students (Morris, 2010). The aim of this international collaboration project is to understand the role of ethics in the decision to participate in social media as a teacher student. The project will take form of a cross cultural comparison of Australian and Norwegian teacher education students.

Overarching research questions – Investigate:
- Whether the professional same issues and ethical considerations are prevalent in Australia and Norway.
- Whether there is a strong awareness of privacy/professionalism in the use of Facebook in teacher students in Australia and Norway.
- Reports in the media about teachers engaging with students on Facebook in Australia and Norway.
- Compare professional codes of conduct for teachers in Norway compared to Australia.
- Compare cultural contexts first in order to decide to add other items into scales (based on the PIBS; Morris & Richardson, 2010), to allow for differences in professional codes/cultural differences.

Specific details:
- Initiated by Associate Professor Brita Bjørkelo and Zoe Morris, PhD Candidate and FIT-Choice Research Assistant at the Faculty of Education, Monash University; and her supervisors Associate Professors Paul Richardson & Helen Watt.
- Translation of Morris & Richardson's pilot scale called Professional Interactions and Behaviour Scale (PIBS) developed in an Australian context into Norwegian. Validation is to be undertaken in Australia by the end of 2010.
- Collect data from Australia and Norway. The Australian and Norwegian sample will consist of 3rd and 4th year undergraduate pre-service secondary teaching students.
- Scientific articles will be co-authored by the participants in the project.

Project 3: Feedback and ICT in lectures

Based on the criticism from both the evaluation of Norwegian pedagogy (NFR 2004/2006) and the Norwegian student organisations, this study focuses on if, and eventually how, feedback clickers (TurningPoint®) can be used to overcome some of the challenges lecturers have in large plenary lectures. The Bologna-process, new standards for national curricula, increasing diversity among university students and the digital revolution have changed some of the underlying premises for teaching and learning in today's universities. New policy documents, research and experiences from the university field suggest that there is a potential to develop plenary lectures in light of new technology and more updated teaching methods. A new concept, digital didactics, is underpinning this time of upheaval and this case study focus on how bachelor students in psychology in large plenary lectures experience the use of innovative technology, feedback clickers, from their points of view. International research

within the area shows that new technology as feedback clickers can, under well planed didactical circumstances, have the potential to enhance interactivity, attention and reflection, as well providing feedback and formative assessment, which are the ground pillars of the Quality Reform in Norway.

Research question:
What perceptions do psychology students have of feedback clickers in plenary lectures in relation to their own learning aims and learning outcomes?

Design:
This study is designed as a mixed method study and consists of surveys, 'live surveys', observations and document studies.

Project 4: Multimodality and learning effect

This study is accompanied by the use of 3D web-based system in learning tasks of psychology students. Even if much of such ICT-initiatives in Norway today are positive, one has to ask how many of these digital learning resources used in universities and schools are based on research findings within the area of multimedia learning. This seems to be special important in relation to create a valid content to the concept *subject-use of ICT* and to carry out research based teaching for psychology students and other students. The study address this issue and is grounded on Richard Mayer's (2001, 2005, 2009) main findings within the area of multimedia learning to enhance academic achievements:

- *Multimedia principle*: Students learn better from words and pictures than from words alone.
- *Spatial Contiguity Principle*: Students learn better when corresponding words and pictures are presented near rather than far from each other on page or screen.
- *Temporal Contiguity Principle*: Students learn better when corresponding words and pictures are presented simultaneously rather than successively.
- *Coherence Principle*: Students learn better when extraneous words, pictures, and sounds are excluded rather than included.
- *Modality principle*: Students learn better from animation and narration than from animation and on-screen text.
- *Redunancy principle*: Students learn better from animation and narration than from animation and on-screen text.
- *Individual Differences Principle*: Design effects are stronger for low-knowledge learners than for high-knowledge learners and for high-spatial learners rather than for low-spatial learners (Mayer 2001: 184).

Research Question:
What is the learning effect of using multimodal learning resources in teaching and learning tasks compared to paper based (monomodal) learning resources?

Design:
The study is designed as an experiment with sample of psychology students in their first year of a bachelor in psychology.

Project 5: Class management in digital classrooms (already financial supported by the Ministry of Knowledge)

This study focuses on what kind of new management strategies teachers need to develop in light of the large scale implementation of ICT in Norwegian classrooms. This has become more pressing as a result of the new educational reform, *Knowledge Promotion* (KD, 2006) where digital skills is now the fifth basic competence in all subjects at all levels (stage 1-13, 6-19 years). Consequently, Norwegian schools are infiltrated with new technology, and obligatory ICT in all subjects is in many ways making it a time of upheaval for the traditional way of teaching and class management. The introduction of this national curriculum and 1 pupil pr. laptop creates a situation where the pedagogical and didactical conditions in Norwegian classrooms have changed considerably and we need to carry out research within this area.

Research question:
What kind of new skills of class management are required to be a teacher in upper secondary school?
Design:
The study is designed as a mixed method study with both surveys, interviews and observation as methods.

Project 6 *Empirical testing of a theoretical model of digital competence*

This study focuses on testing an innovative model of digital competence which is developed by the head of the research group DLC and published and cited in several international journals.
The introduction of ICT brings new opportunities, but at the same time presents many challenges for the teachers, who will have to cope with greater complexity in their everyday practice. Teachers' practice builds on their own learning and teaching experiences, but when it comes to ICT and teaching they have to create conditions for learning that they themselves may never have encountered before. Another problem is that even today ICT is not incorporated properly in teacher education (NIFU/STEP, 2008) or in the national curriculum regulations for teacher education in Norway (UFD, 2003), and there is a danger of a gap between teachers' education and the practices they encounter afterwards. On this backdrop, it is evident that the teacher must achieve a necessary digital competence in school of today. When we approach the narrower content of digital competence and what this means for learning in both physical and digital classrooms, the need for digitally competent teachers becomes even more apparent. Internationally a number of important contributions have been made towards the definition of *digital literacy* in recent years. Lanham (1995), Gilster (1997), Tyner (1998), Knobel (1999) Lankshear & Knobel (2003) and Buckingham (2003, 2006) have particularly contributed towards the concepts of *computer literacy, media literacy* and *digital literacy*. Despite the importance of these international contributions in providing a conceptual understanding of the terms, it is clear that not all of them can be easily transferred to the context of Norwegian schools and digital competence among Norwegian teachers under the new national curriculum. It is therefore important that attempts have been made to create a Norwegian understanding of complex digital competence in the light of the didactical circumstances in Norway. In an attempt to incorporate its implications for the individual teacher's digital didactic, Krumsvik has developed a definition aimed at describing the digital competence of the teacher which is attached to the digital didactic: 'Digital competence is the teacher's proficiency in using ICT in a professional context with good didactic judgement and his or her awareness of its implications for learning strategies and the digital Bildung of pupils'(Krumsvik, 2007b, p. 74). This definition is attached to a model (Figure 5) which

visualises this definition of teachers' digital competence. The study aims to test this theoretical model empirically.

Research question: In what degree is the theoretical model of digital competence empirically valid for teachers in upper secondary school?

Design: The design of the study is mixed method design.

Milestones for the six projects in DLC 2011-2014:

Research Studies	Start
Project 1	Spring 2011, 4 researchers from DLC
Project 2	Spring 2011, 2 researchers from DLC, 1 researcher from Australia
Project 3	Spring 2012, 2 researchers from DLC
Project 4	Spring 2012, 3 researchers from DLC
Project 5	Spring 2013, 2 researchers from DLC
Project 6	Spring 2014, 2 researchers from DLC

PhD-projects in DLC:

Below you will find a description of the PhD-projects in DLC. The senior staff in the group is supervising these PhD-students.

PhD-student Rune Herheim

Communication at Computers

This PhD-project consists of two phases. In phase one, the focus is to better understand how pupils communicate when they use computers to learn mathematics. In phase two, the focus is on communication- and learning potentials when educational software is used in mathematics learning. The unit of analysis is two pupils who cooperate in a dyad and share one computer. A key issue is to gain knowledge on connections between the quality of pupils' communication and the quality of their learning.

The theoretical perspective is based on a dialogic (Bachtin & Holquist, 1981; Linell, 1998; Rommetveit, 1992), distributed, and situated (Lave & Wenger, 1991) view on learning. Pupils' learning is viewed as interplay between social interaction and pupils' own construction.

The project strives to blend "empirical educational research with the theory-driven design of learning environments" (Design-Based Research Collective, 2003, p. 5). The methodological term is Design-based research, and is rooted in the work of (Brown, 1992) and (Collins, 1992). The aim is to improve the quality of education by systematic iterative analysis, design, development, and implementation (Wang & Hannafin, 2005). Through collaboration among pupils, teachers, and the researcher, one searches to generate knowledge which is context sensitive and informative to other teachers and researchers.

PhD-student Morten K. Pedersen

Literacy and journalism: A study of how journalists develop literacy through education and practice

This ethnographic field study aims at generating knowledge about the field of journalism; namely what kind of literacy journalists must develop in education and practice in order to be perceived as employable today and in the future.
My study will focus on a professional group that is obliged to develop a variety of literacies, not only reading, writing and numeric skills, but also digital literacy and the ability to scrutinize information and power structures. I'm trying to get an understanding of how their own/future employers'/experienced professionals' perspectives (and practises) corresponds with the current profile of the journalist education with respect to different literacies.
The main research problem statement of this study is: *How do journalists develop literacy through education and practice?*

PhD-student Vigdis Vangsnes

ICT and dramaturgy in pre-school settings

The aim of the study is to gain knowledge about digital games for pedagogical purposes and develop an analytical framework for discussing criteria and quality in digital games.

The main research question is: How can we by the help from dramaturgic theories analyse, interpret and understand pedagogical digital games, and the way they are used by children, as a multimodal medium featured by its historical, sociological and cultural context; what will be the requirements for the analytical tools discussing quality and criteria?

The PhD-projects aims to study if, and ev. how it can it be formulated a general analytical frame work for analysing digital role-plays by drawing on dramaturgic theory. Theories on ludology, narratology and dramaturgy will be employed and video-observations from 4 kindergartens, 20 hours recorded video of children playing digital games from each kindergarten will be the main empirical source. The video-observations will be transcribed by help from the program "Hyper Transcribe" and will be analyzed by help from "Hyper Research", as well as by help from the analytical tool developed in part three of my PhD-project.

PhD-student Petter Kongsgården

ICT – as artefact in formative assessment and

The aim of the study is to examine if, and ev. how ICT is an artifact that can enhance the possibilities for the teacher to carry out formative assessment in school.

The main research question is: How can ICT contribute to enhance the formative assessment in upper secondary school?

The PhD-projects aims to carry out a qualitative design where teacher and pupils from two upper secondary schools are constituting the sample. Theoretically the study is grounded on a sociocultural approach and theories and research within feedback. The data material will be transcribed and analyzed by help from the program "Nvivo".

In addition to these PhD-students, DLC will actively apply and recruit new PhD-students through the Faculty of Psychology's announcements of positions, as well as the national graduate schools of research NAFOL and NATED.

Selected publications from the members in DLC:

Associate professor Bjarte Furnes:
Furnes, B., & Samuelsson, S. (2010). Predicting Reading and Spelling Difficulties in Transparent and Opaque Orthographies: A Comparison Between Scandinavian and U.S./Australian Children. *Dyslexia, 16*, 119-142.
Furnes, B., & Samuelsson, S. (2009). Preschool Cognitive and Language Skills Predicting Kindergarten and Grade 1 Reading and Spelling: A Cross-Linguistic Comparison. *Journal of Research in Reading, 32(3),* 275-292.
Furnes, B., & Samuelsson, S. (2010). Phonological awareness and RAN predicting early development in reading and spelling: Results from a cross-linguistic longitudinal study. Manuscript submitted for publication.

Associate professor Ingrid Helleve:
Helleve, I. (2010. Theoretical foundations of teachers professional development. I: *Online learning Communities and Teacher professional Development. Methods for Improved Education Delivery.* Information Science Reference.
Helleve, I. & Krumsvik, R. J. (2009). If Information and Communication Technology is the answer - What should the question be?. I: *Learning in the Network Society and the Digitized School.* Nova Science Publishers, Inc.
Ulvik, M., Smith, K. & Helleve, I. (2009). Novice in secondary school - the coin has two sides. *Teaching and Teacher Education, 25(6),* 835-842
Helleve, I. (2007). In an ICT-based teacher-education context: why was our group "the magic group"? *European Journal of Teacher Education, 30*(3). 267-284

Associate professor Elisabeth Norman:
Norman, E. (2010). The unconscious in current psychology. *European Psychologist, 15*(3), 193-201.
Norman, E., & Price, M. C. (2010). Exploring ecological validity in implicit learning. Sequences of body movements are learned more implicitly than letter sequences. *Manuscript submitted for publication.*
Norman, E., & Price, M. C. (2010). Measuring "intuition" in the SRT generation task. *Consciousness and Cognition, 19,* 475-477.
Norman, E., Price, M. C., & Duff, S. C. (in press). Fringe consciousness: A useful framework for clarifying the nature of experience-based feelings. To appear in A. Efklides og P. Misailidi (Eds.). *Trends and Prospects in Metacognition Research.* New York: Springer.
Norman, E., & Nielsen, G. H. (2009). Klinisk intuisjon – forenlig med evidensbasert praksis? *Tidsskrift for Norsk Psykologforening, 46,* 940-947.
Norman, E., & Schulte-Mecklenbeck, M. (2009). Take a quick click at that! Information search tracing by eye tracking and in mouselab. In A. Glöckner og C. Witteman (Eds.). *Tracing intuition: Recent methods in measuring intuitive and deliberate processes in decision making* (pp. 24-44). London, UK: Psychology Press.
Norman, E., Price, M. C., Duff, S. C., & Mentzoni, R. A. (2007). Gradations of awareness in a modified sequence learning task. *Consciousness and Cognition, 16,* 809-837.

Norman, E., Price, M. C., & Duff, S. C. (2006). Fringe consciousness in sequence learning: The influence of individual differences. *Consciousness and Cognition, 15,* 723-760.

Price, M. C., & Norman, E. (2009). Cognitive feelings. In P. Wilken, T. Bayne, & A. Cleeremans (Eds.). *Oxford Companion to Consciousness* (pp. 141-144). Oxford, UK: Oxford University Press.

Price, M. C., & Norman, E. (2008). Intuitive decisions on the fringes of consciousness: Are they conscious and does it matter? *Judgment and Decision Making, 3,* 28-41.

Reber, R., Hetland, H., Chen, W., Norman, E., & Kobbeltvedt, T. (2009). Effects of example choice on motivation and learning. *The Journal of the Learning Sciences, 18,* 509-548.

Norman, E., (2002). Subcategories of "fringe consciousness" and their related nonconscious contexts. Psyche, 8 (15), URL: http://psyche.cs.monash.edu.au/v8/psyche-8-15-norman.html

Assistant professor Helga Myrseth:

Molde, H., Hystad, S. W., Pallesen, S., Myrseth, H. & Lund, I. (2010). Evaluating lifetime NODS using Rasch modelling. *International Gambling Studies, 10*, 189-202.

Molde, H., Johnsen, B.J., Myrseth, H., & Pallesen, S., (submitted). Outcome of short term cognitive behavioural group treatment for pathological gambling.

Myrseth, H., Brunborg, G.S., & Eidem, M. (in press). Differences in cognitive distortions between pathological and non-pathological gamblers with preferences for chance or skill games. *Journal of Gambling Studies*, DOI: 10.1007/s10899-010-9180-6.

Brunborg, G.S., Johnsen, B.J., Pallesen, S., Molde, H., Mentzoni, R., Myrseth, H. (in press). The relationship between aversive conditioning and risk-avoidance in gambling. *Journal of Gambling Studies*.

Myrseth, H. & Pallesen, S. (2010). Pharmacological Treatments of Impulse Control Disorders. In M. Hertzman & L. Adler (Eds.), Clinical Trials in Psychopharmacology: A better Brain (2nd ed), pp. 289-308. New York: Wiley and Sons Inc.

Myrseth, H., Pallesen, S., Molde, H., Johnsen, B.H., & Lorvik, I.M. (2009). Personality factors as predictors of pathological gambling, *Personality and Individual Differences*, *47*, 933-937.

Myrseth, H., Litlerè, I., Støylen, I.J., & Pallesen, S., 2008. A controlled study of the effect of cognitive-behavioural group therapy for pathological gamblers, *Nordic Journal of Psychiatry, 23*, 23-31.

Pallesen, S. Molde, H., Arnestad, H.M., Laberg, J.C., Skutle, A., Iversen, E., Støylen, I. J., Kvale, G. & Holsten, F., 2007. Outcome of pharmacological treatments of pathological gambling – A review and meta-analysis. *Journal of Clinical Psychopharmacology, 27 (4)*, 357-364.

Pallesen, S. Molde, H., Arnestad, H. M., Skutle, A., Mentzoni, R., & Holsten, F., 2006. Medikamentell behandling ved spilleavhengighet. *Tidsskrift for Den norske lægeforening, 126 (10)*, 1322-1324.

Professor Rune Krumsvik:

Krumsvik, R. (In press). *The digital school and teacher education in Norway.* Jahrbuch die Medienpedagogik. Dortmund: Springer.

Herheim, R. & Krumsvik, R. (In press). Communication in computers settings. *Journal for Educational Research Online*.

Krumsvik (in press). Feedback clickers in plenary lectures - a new tool for formative assessment? In L. Rowan & P. Bigum, *Future Proofing Education: Transformative approaches to new technologies and student diversity in futures oriented classrooms*. London: Springer.

Olivero, F. & Krumsvik, R. (2009). Introduction to the themed articles on videopapers, *Technology, Pedagogy and Education,* 3(18), 249 – 253.

Krumsvik, R. & Smith, K. (2009). Video papers – an attempt to narrow the notorious gap between theory and practise in Teacher Education. Special issue, *Technology, Pedagogy and Education.* 3(18) 269-278,

Krumsvik, R. (2009). Preface. In R. Krumsvik (Ed), *Learning in the Network Society and the digitized school* (pp. 1-20). New York: Nova Science Publishers.

Helleve, I. & Krumsvik, R. (2009). If Information and Communication Technology is the answer - What should the question be? In R. Krumsvik (Ed), *Learning in the Network Society and the digitized school* (pp. 1-20). New York: Nova Science Publishers.

Krumsvik, R. (2009). Situated learning in the network society and digitized school. *European Journal of Teacher Education, 2(32), 167-185.*

Krumsvik, R. (2008). Situated learning and digital competence. *Education and Information Technology, 4(13),* 279-290.

Krumsvik, R. (2008). From digital divides to digital inequality. *US-China Educational Review*, 9 (5), 1-16.

Almås, A.G. & Krumsvik, R. (2008). Teaching in Technology-Rich Classrooms: is there a gap between teachers' intentions and ICT practices? *Research in Comparative and International Education* 2(3), 103-121.

Krumsvik, R. (2008). Educational technology, epistemology and discourses in curricula and school. *US-China Educational Review, 5*(5), 1-16.

Krumsvik, R. & Grov, A. (2009). A new digital didactic? In R. Krumsvik (Ed), *Learning in the Network Society and the digitized school.* (pp. 1-34). New York: Nova Science Publishers.

Krumsvik, R. (2008). The view of knowledge and the new national curriculum in Norway. *US-China Educational Review*, 7(5), 13-28.

Krumsvik, R. (2008). Situated learning in the Network Society. *Seminar.net*, *Media, Technology & Lifelong Learning*, 2(4), 1-6.

Jones. L. & Krumsvik, R. (2008). Special needs student in higher education. *US-China Educational Review*, 3(5), 58-67.

Krumsvik, R . (2008). The Emerging Digital Literacy among Teachers in Norway (The Story of One Digital Literate Teacher). In, Riko Kobayashi (ed.), New Educational Technology, pp. 105-125. New York: Nova Science Publishers.

Smith, K. & Krumsvik, R. (2007). Video papers - a means for documenting practitioners' reflections on practical experiences: The story of two teacher educators. *Research in Comparative and International Education,* 2 (4), 272-282.

Almås, A.G. & Krumsvik, R. (2007). Digital literate teachers in Leading Edge schools in Norway. *Journal of In-Service Education*, 4, *479-497.*

Krumsvik, R. & Jones, L.(2007). Situert læring, digital kompetanse og tilpassa opplæring. *Norsk pedagogisk tidsskrift* 4(91), 316-328.

Krumsvik, R. (2007). R. Krumsvik (red.), *Skulen og den digitale læringsrevolusjonen.* Oslo: Universitetsforlaget.

Krumsvik, R. (2006). ICT and innovations in lower secondary school. I: A-L. Østern, K. Sjöholm & S-B Arnolds-Granlund, *Kulturella möteplassar i tid og rum.* Forskningsrapport nr. 18. Pedagogiska Fakulteteten. Åbo Akademi. Vasa: Åbo Akademi.

Krumsvik, R. (2006). The digital challenges of school and teacher education – some urgent questions and the search for answers. *Education and Information Technologies*, 3 & 4(11), 239-256.

Krumsvik, R. (2006). *ICT in the school. ICT-initiated school development in lower secondary school* . Doktorgradsavhandling, Dr. Philos-graden. Universitetet i Bergen.

Krumsvik, R. (2005): ICT and community of practise. *Scandinavian Journal of Educational Research*, 49, 1, 26-50.
Krumsvik, R. (2005): ICT and innovations in lower secondary school. *Nordisk Pedagogik,* 25(3), 206-233.
Krumsvik, R. (2004): Elevar som kunnskapsprodusentar. *Norsk Pedagogisk Tidsskrift*, 88, 467 – 480.
Krumsvik, R. (2003): Når teknologien sit i førarsete. *Norsk Pedagogisk Tidsskrift*, 87, 3-4, 133-145.

Associate professor Brita Bjørkelo:
Bjørkelo, B., Einarsen, S., Nielsen, M. B., & Matthiesen, S. B. (in press). Silence is golden? Characteristics and experiences of self-reported whistleblowers. *European Journal of Work and Organizational Psychology*.
Bjørkelo, B., Matthiesen, S. B., & Einarsen, S. (2010). Predicting proactive behaviour at work. Exploring the role of personality as an antecedent of whistleblowing behaviour. *Journal of Occupational and Organizational Psychology, 83*, 371-394.
Bjørkelo, B., Ryberg, W., Matthiesen, S. B., & Einarsen, S. (2008). "When you talk and talk and nobody listens": A mixed method case study of whistleblowing and its consequences *International Journal of Organisational Behaviour, 13*(2), 18-40.
Bjørkelo, B., Matthiesen, S. B., & Einarsen, S. (2008). Varslingens mange ansikter: En oppsummering av forskning og litteratur om varsling i arbeidslivet [The many faces of whistleblowing: a review on research and literature on whistleblowing at work]. *Søkelys på arbeidslivet, 25*(1), 3-19.
Bjørkelo, B., & Taraldset, B. (2010). Varsling som intern sikkerhetsventil i større IKTprosjekt: Om organisasjonens rolle i håndtering av operasjonell risiko [Whistleblowing as an internal system of control in large IKT-projects: The organisations role in relation to operational risk]. *Magma, 13*(4), 27-34.
Låstad, L., Thuen, R. H., Bekkeheien, M., Bjørkelo, B., & Bye, H. H. (2008). Tilhørighet og sosial identitet: Fortellinger og opplevelser fra en organisasjon i endring [Organisational commitment and social identity: Stories and experiences from an organisation undergoing change]. *Psykologisk Tidsskrift*(2), 70-74.
Matthiesen, S. B., & Bjørkelo, B. (2008). Sladrehank skal selv ha bank. Om "whistleblowing" i norsk arbeidsliv [Informers may pay a high price. Whistleblowing in Norway]. *Tidsskrift for norsk psykologforening, 3*, 318-328.
Nielsen, M. B., Bjørkelo, B., Notelaers, G., & Einarsen, S. (2010). Sexual harassment: Prevalence, outcomes and gender differences assessed by three different estimation methods. *Journal of Aggression, Maltreatment and Trauma, 19*(3), 252 — 274.
Matthiesen, S. B., & Bjørkelo, B. (2009). Oppslukt av jobben - hva kan gjøres? Om arbeidsnarkomani i dagens arbeidsliv [Obsessed by work – what can be done? About workaholism in todays working life]. I P. Ø. Saksvik & K. Nytrø (Red.), *Klinisk organisasjonspsykologi* (s. 187-216). Trondheim: Cappelen Akademisk Forlag
Matthiesen, S. B., Bjørkelo, B., & Burke, R. J. (in press). Workplace bullying as the dark side of whistleblowing. In S. Einarsen, H. Hoel, D. Zapf & C. L. Cooper (Eds.), *Bullying and harassment in the workplace: Developments in theory, research, and practice* (2 ed., pp. 299-322). London: Taylor & Francis.
Matthiesen, S. B., & Bjørkelo, B. (in press). Workplace bullying - A toxic part of organizational life. In R. J. Burke, S. Clarke & C. L. Cooper (Eds.), *Occupational health and safety: Psychological and behavioural aspects of risk*. Farnham: Gower Publishing.

PhD-student Morten K. Pedersen:
Pedersen, M. K. & Lillejord, S. (2010). DeLivering in a moment. Learning and knowledge building in online news production. (Submitted)

PhD-student Rune Herheim:
Herheim, R. og Rune Krumsvik (In press). Communication in a Computer Context. Journal of educational research online.
Herheim, R. (2010). Communication and Learning at Computers: an Overview. Nordic Studies in Mathematics Education (15) 2.

Summary of our "Såkorn" - application

This last section will summarize our application focusing on how we quality assure our application and studies.

Originality in the form of scientific innovation and development of new knowledge;
The research group proposes new developments regarding ICT in education and its implications for learning. The main innovative and unifying elements across the sub-studies are related to research areas which still are under researched both nationally and internationally.

Formulation of objectives, research problems and hypotheses;
As a research group, we want to clearly state the objectives in all phases of the project, and describe the research questions in detail. Peer learning, paper presentations and peer review are remedies to fulfil these ambitions.

Strength of theoretical approach, operationalisation and the use of scientific method;
The group employs different kinds of theoretical lenses – from cognitive psychology to a socio-cultural perspective on learning. DLC will carry out both quantitative - and qualitative designs, as well as Mixed Methods designs.

Status of knowledge, literature and references;
The members of the research group are aware of the major contributions within the different research fields, but will systematically carry out a further literature review when a project starts.

Research group

Our research group has the knowledge and experience required in this field of research as well as general qualifications in order to lead and organise projects. The primary members of the research group consist of three pedagogues (1 professor and two associate professors), three psychologists (associate professors) and two PhD-students. In addition, the research group has two external PhD-students and one associate professor as external members of the group. Several members of the group supervise master and doctoral students at the University of Bergen.

Within the research group, we are aware of the importance of focusing on whether the research group has the required expertise, resources and/or infrastructure, and sufficient contacts at the national and international level. The general expertise is high with respect to pedagogical, psychological and technological aspects. Moreover, the group has very good quantitative and qualitative methodological competence.

Feasibility

This part focus on whether the project is realistic and feasible scientifically, organisationally, and within the stated budgetary and timeline parameters. As a research group we will state that project has been planned adequately, in terms of phases, milestones and division of labour. The expertise of the partners and the collaboration with international teams provide enough elements in favour of a feasible plan.

International cooperation

This part focuses on the extent to which the project will contribute to the internationalisation of Norwegian research in the relevant field, and our plans as to how to accomplish this. A main point for the research group is that the selection of international partners will improve the group's projects both in terms of quality and feasibility. One of DLC's strengths is that we already collaborate with several well-known and recognized international researchers who will participate in different ways in DLC's development.

Relevance and benefit to University of Bergen

We will also focus on the extent to which DLC and our application is relevant to UoB, e.g. by considering its contribution to the PhD-programme, and to knowledge/competence that would in the short or long term be of significance to meeting major challenges within the university.

The main foreseen impact is on the innovative technological and pedagogical aspects attached to the different studies. However, a much wider impact is possible, if the research group succeeds with the longitudinal milestones of the studies, workshops, collaborations, etc. Figure 2 below visualizes DLC's strategy during the "Såkorn"-period .

Figure 2. The figure shows DLC's strategy from 2011-2014'