Professional Digital Competence in Teacher Education

A mixed methods study of the emphasis on and integration of Professional Digital Competence in Teacher Education Programmes in Norway

by

Elen Johanna Instefjord

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N-4036 Stavanger
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“Would you tell me, please, which way I ought to go from here?” “That depends a good deal on where you want to get to,” said the Cat. “I don't much care where –“ said Alice. “Then it doesn't matter which way you go,” said the Cat. “- so long as I get somewhere,” Alice added as an explanation. “Oh, you're sure to do that,” said the Cat, “if you only walk long enough” (Carroll, 1920, p. 89).

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Stord, December 2017

Elen Johanna Instefjord

Abstract

This thesis examines how professional digital competence is integrated in initial teacher education programmes in Norway. The thesis is article-based, comprising an extended abstract and three articles. The extended abstract comprises a review of relevant research, theoretical foundation, methodology and research design, and a summary and general discussion of the three articles. The extended abstract is closed with a discussion of the main research question, main findings, implications and limitations, and some final conclusions.

The overall aim of the study is to gain knowledge about how pre-service teachers are trained to use technology during their time in teacher training. The thesis is grounded on a general assumption that use of technology and development of professional digital competence for pre-service teachers take place within a sociocultural environment. Therefore, the thesis draws on a sociocultural perspective, with particular focus on Wertsch's (1998) distinction between mastery and appropriation of cultural artefacts. This theoretical foundation is integrated with theories and research on digital competence.

The main research question for the thesis is: *How do initial teacher education programmes in Norway attend to integration of technology and development of pre-service teachers' professional digital competence?*

The research question has been operationalized through three sub-questions. Each of these questions have been explored through an individual sub-study, and reported in an article. Methodologically, the thesis uses a mixed methods approach to study the qualitative and quantitative aspects of integration of digital competence in teacher education. This choice is grounded on the premise that a combination of multiple sources of data can contribute to illuminating the research question from different angles and thus provide a better understanding and insight into the complexity of the research question. The three articles are briefly summarized below.

In the first article focus is directed towards integration of digital competence in curriculum documents for teacher education in Norway. The field was

approached with the question: *Which knowledge areas of digital competence are addressed in national and local curriculum documents, and how?*

A model inspired by the work of Zhao, Pugh, Sheldon and Byers (2002), as well as Krumsvik (2008), and Mishra and Koehler (2006) has been developed as an analytical framework. Teachers' digital competence is here understood as comprising three knowledge areas: technology proficiency, pedagogical compatibility and social awareness. National guidelines and curriculum regulations, along with programme descriptions from 19 teacher education institutions have been analysed using this framework.

The results of the study indicate that use of technology does not have a prominent position in curriculum documents. There are few binding learning outcomes for the integration of technology, suggesting that digital competence is still not regarded as an important component of teachers' professional competence. The results of the analysis also reveal that programme descriptions from two of the teacher education institutions distinguish themselves from the others, representing opposite extremes with respect to technology integration; the first containing no examples of technology integration, not even the formulations found in the national curriculum documents, and the second, representing the opposite end of the scale with multiple examples. This may indicate that there still are substantial differences between institutions in terms of technology integration and how institutions influence pre-service teachers to use technology. These institutional variations may contribute to providing pre-service teachers with differing levels of knowledge of the use of technology in education, and thus enhance digital divides among graduates. Ultimately, this may in turn contribute to maintaining low levels of the educational use of ICT in schools.

By clarifying the content of the concept "teachers' digital competence" the article aims to contribute to increasing teacher educators' awareness of which areas of knowledge they integrate into their curricula, what the goal of this knowledge is, and which strategies are best suited to help pre-service teachers acquire this knowledge.

Based on the results of the first study, the second study is carried out as a multiple-case study with two cases. These cases are the two institutions that

distinguished themselves from the rest in the analysis of the curriculum documents. The aim of the second article is to explore opportunities for appropriation of digital competence in teacher education. Focus is directed towards teacher educators' and pre-service teachers' perceptions and descriptions of digital competence, and how technology is being used and appropriated by teacher educators and pre-service teachers. The article is guided by the following research question: *What opportunities for appropriation of digital competence does teacher education offer?*

The teacher educators who participated in the study all reported that they used digital tools both for preparations, in the office, at home, and in the classroom. They all reported to have sufficient access to the required technology, with the exception of interactive whiteboards. For this reason they did not feel confident using this technology in the classroom.

Findings indicate that the same challenges are found in both institutions: the conflict between mastery and appropriation, and between personal and educational use of technology, and the resistance towards technology among some teacher educators. The results signify that in order to create opportunities for appropriation of digital competence and encourage use of technology as part of pre-service teachers' professional didactic competence, technology should be better integrated as pedagogical tools for teaching and learning in all subjects in the teacher education programmes.

The third article reports from data gathered though three national questionnaire surveys conducted among mentor teachers, teacher educators and pre-service teachers in Norway. The main research question in the article is: *How is professional digital competence integrated in initial teacher education?* The main research question is addressed through three sub-questions.

The results of the study show that teacher educators and students score their own competence at about the same level, while teachers in schools report higher values for their competence. There are weak positive correlations between positive leadership, leadership support of instruction, and teacher educators' digital competence, but stronger positive correlations between teacher educators' self-reported efficacy and digital competence. It

appears to be the case that digital competence is more of an individual factor than an organizational. Results are discussed in relation to teacher education's role in qualifying for professional work in digital classrooms.

Based on the findings in the three articles, the main contribution of this thesis is increased knowledge about how teacher education contributes to the development of pre-service teachers' professional digital competence. The overall interpretation of the three studies is that there are only minor differences between the individual teacher education institutions in terms of integration of technology in curriculum documents, and teacher educators and pre-service teachers' understanding of professional digital competence. Teacher educators, pre-service teachers and mentor teacher in all institutions score their own competence as relatively high. Nevertheless, the results indicate that pre-service teachers are less positive about their teachers as role models than the teacher educators themselves are. This may indicate that there still is a way to go before development of pre-service teachers' professional digital competence is integrated in both the curriculum and the teaching practices of teacher education institutions.

Sammendrag (Norwegian)

Denne avhandlingen undersøker hvordan profesjonsfaglig digital kompetanse er integrert i grunnskolelærerutdanningene i Norge. Avhandlingen er artikkelbasert og består av tre artikler og en kappetekst. Kappeteksten inneholder en gjennomgang av relevant forskning, avhandlingens teoretiske forankring, metodologi og forskningsdesign, samt sammendrag og drøfting av de tre artiklene. Kappeteksten avsluttes med en drøfting av studiens overordnede problemstilling, funn, implikasjoner og begrensninger.

Det overordnede målet med studien er å bidra til økt kunnskap om hvordan grunnskolelærerutdanningene bidrar til å utvikle lærerstudentenes profesjonsfaglige digitale kompetanse. Avhandlingen bygger på en generell antakelse om at bruk av teknologi og utvikling av lærerstudentenes profesjonsfaglige digitale kompetanse foregår innenfor en sosiokulturell kontekst. Dette plasserer avhandlingen innenfor et sosiokulturelt perspektiv, med særlig fokus på Wertschs (1998) skille mellom mestring og appropriering av kulturelle artefakt. Denne teoretiske forankringen er integrert med teorier og forskning på digital kompetanse.

Avhandlingens overordnede problemstillinger er: *Hvordan ivaretar norske lærerutdanninger integrering av teknologi og utvikling av lærerstudentenes profesjonsfaglige digitale kompetanse? (How do initial teacher education programmes in Norway attend to integration of technology and development of pre-service teachers' professional digital competence?)*

Problemstillingen er operasjonalisert gjennom tre forskningsspørsmål. Hvert av disse spørsmålene er studert gjennom en individuell studie, og funnene fra hver av studiene er drøftet i en artikkel. Metodologisk benyttes det en mixed methods tilnærming til studien, hvor kvalitative og kvantitative aspekt ved integrering av digital kompetanse i grunnskolelærerutdanningene er studert. Dette bygger på en antakelse om at flere datakilder kan bidra til å belyse problemstillingen fra ulike perspektiv og således bidra til en bedre forståelse av og innsikt i problemstillingens kompleksitet. De tre artiklene vil bli kort oppsummert under.

I den første artikkelen er fokus rettet mot integrering av digital kompetanse i plandokumenter for grunnskolelærerutdanningene i Norge. Gjennom studien blir følgende spørsmål besvart: *Which knowledge areas of digital competence are addressed in national and local curriculum documents, and how?*

En modell inspirert av Zhao, Pugh, Sheldon og Byers (2002), Krumsvik (2008), og Mishra og Koehler (2006) er utviklet som et analytisk rammeverk. Læreres digitale kompetanse er her forstått som en kompetanse som omfavner tre kompetanseområder: teknologisk ferdighet, pedagogisk kompatibilitet og sosial bevissthet. På bakgrunn av dette rammeverket har nasjonale retningslinjer, forskrift for lærerutdanning og lokale programplaner for 19 lærerutdanningsinstitusjoner blitt analysert.

Funnene viser at bruk av teknologi ikke har en fremtredende posisjon i plandokumentene. Det finnes få læringsutbytteformuleringer som omhandler integrering av teknologi, noe som kan tyde på at digital kompetanse fortsatt ikke er ansett som en betydelig del av læreres profesjonsfaglige kompetanse. Resultatene viser også at programplaner for to av lærerutdannings-institusjonene skiller seg noe fra de andre, og representerer på denne måten to ytterpunkter når det gjelder integrering av teknologi. Den ene har ingen eksempler på integrering av teknologi, ikke en gang formuleringene som finnes i nasjonale plandokument, mens det i programplanene for den andre institusjonen finnes flere eksempler. Dette kan indikere at det er vesentlige forskjeller mellom institusjoner i forhold til integrering av teknologi og hvordan institusjonene tilrettelegger for og påvirker lærerstudentenes bruk av teknologi. Slike forskjeller kan bidra til at studenter fra ulike lærerutdanningsinstitusjoner kommer ut fra studiet med ulik kunnskap om bruk av teknologi i undervisningen og således fremme digitale skiller mellom studentene. I neste omgang kan dette medføre at bruken av teknologi for å fremme læring i klasserommet holdes på et lavt nivå.

Ved å bidra til å klargjøre innholdet i begrepet «læreres digitale kompetanse» søker artikkelen å bidra til å øke lærerutdannernes bevissthet om hvilke kunnskapsområder de integrerer i undervisningen, hva målet med denne kunnskapen er og hvilke strategier som er best egnet for å hjelpe lærerstudentene med å tilegne seg denne kunnskapen.

Med bakgrunn i funn fra den første studien er den andre studien lagt opp som en kasusstudie av to institusjoner. Dette er de to institusjonene som utmerket seg i analysene av programplanene. Målet med den andre artikkelen er å undersøke hvordan lærerutdanningene tilrettelegger for appropriering av digital kompetanse i grunnskolelærerutdanningene. Fokus er rettet mot lærerutdannere og grunnskolelærerstudenters oppfatning og forståelse av digital kompetanse. I tillegg fokuseres det på hvordan teknologi brukes og approprieres av lærerutdannere og lærerstudenter. Artikkelen bygger på følgende forskningsspørsmål: *What opportunities for appropriation of digital competence does teacher education offer?*

Funnene fra undersøkelsen viser at lærerutdannerne som deltok i studien bruker digitale verktøy både til forberedelser (hjemme og på kontoret) og i klasserommet, og at de mener at de har tilstrekkelig tilgang til nødvendig utstyr. Et unntak fra dette er interaktive tavler, og på grunn av dette rapporterer de at de ikke føler seg trygge på å bruke denne teknologien i klasserommet. Funnene indikerer videre at de samme utfordringene eksisterer hos begge institusjonene: konflikten mellom mestring og appropriering, og motstand mot teknologi blant noen av lærerutdannerne. Dette synliggjør at for å skape muligheter for appropriering av digital kompetanse og oppmuntre til bruk av teknologi som en integrert del av lærerstudentenes profesjonsfaglige didaktiske kompetanse bør teknologi integreres bedre som et pedagogisk verktøy for undervisning og læring i alle fagene i grunnskolelærerutdanningene.

Den tredje artikkelen rapporterer fra data som er samlet inn gjennom tre nasjonale spørreundersøkelser rettet mot praksislærere, lærerutdannere og grunnskolelærerstudenter i Norge. Forskningsspørsmålet som blir drøftet i artikkelen er: *How is professional digital competence integrated in initial teacher education?* Dette spørsmålet er operasjonalisert gjennom tre delspørsmål (se Artikkel III).

Resultatene av studien viser at lærerutdannere og lærerstudenter vurderer sin digitale kompetanse til å være på tilnærmet samme nivå, mens praksislærerne rapporterer vurderer sin kompetanse noe høyere. Det finnes svake positive korrelasjoner mellom positiv ledelse, ledelsens støtte av undervisning, og lærerutdannernes digitale kompetanse, og sterkere positive korrelasjoner

mellom lærerutdannernes selvrapporterte self-efficacy og deres digitale kompetanse. Det fremkommer også at digital kompetanse synes å være en mer individuell faktor enn en organisatorisk faktor. Funnene i undersøkelsen drøftes i forhold til lærerutdanningens bidrag til å kvalifisere for arbeid i teknologitette klasserom.

Basert på funnene i de tre artiklene er hovedbidraget til avhandlingen økt kunnskap om hvordan grunnskolelærerutdanningene bidrar til å utvikle studentenes profesjonsfaglige digitale kompetanse. Den overordnede tolkningen av funnene i de tre artiklene viser at det kun er små forskjeller mellom ulike lærerutdanningsinstitusjoner både når det gjelder integrering av teknologi i læreplanene, og lærerutdannere og lærerstudenters oppfatning av digital kompetanse. Til tross for dette viser funnene at lærerstudentene er mindre positive enn lærerutdannerne når det gjelder lærerutdannernes betydning som rollemodeller for bruk av teknologi. Dette kan tyde på at lærerutdanningen fortsatt har en vei å gå før utvikling av lærerstudentenes profesjonsfaglige digitale kompetanse er tilstrekkelig integrert i læreplanene og lærerutdanningenes undervisningspraksis.

List of publications

Article I

Instefjord, E., & Munthe, E. (2016). Preparing pre-service teachers to integrate technology: an analysis of the emphasis on digital competence in teacher education curricula. *European Journal of Teacher Education, 39*(1), pp. 77-93.

Article II

Instefjord, E. (2014). Appropriation of Digital Competence in Teacher Education. *Nordic Journal of Digital Literacy, 9*(4), pp. 313–329.

Article III

Instefjord, E., & Munthe, E. (2017). Educating digitally competent teachers: A study of integration of professional digital competence in teacher education. *Teaching and Teacher Education, 67*(2017), pp. 37-45.

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1 Introduction

Access to and use of information and communication technology (ICT) has increased tremendously in society, at home and in schools. We now use technology in all aspects of our everyday lives, - for entertainment, to search for information, solve tasks and communicate with family, friends and colleagues. This has contributed to a change in our ways to work, communicate, produce content and share information, which has in turn created an increased demand for digital competence.

Students' use of ICT in school has also gained substantial attention in recent years, and digital competence is now regarded as an essential competence for full participation in society in the 21st century (Ananiadou & Claro, 2009). In Norway, students and teachers are expected to use technology in all school subjects at all levels of school (grades 1-13), and digital competence is regarded equally important as reading, writing, arithmetic and speaking (Ministry of Education and Research, 2006a). According to Mueller, Wooda, Willoughby, Ross and Specht (Mueller, Wooda, Willoughby, Ross, & Specht, 2008), the majority of teachers now have access to technology and use computers on a regular basis. This is certainly the case also for Norway, where computer density in school is high in all levels of education (Norwegian Agency for Digital Learning in Higher Education, 2015).

However, in spite of the investments and the ever increasing access to technology in schools (Egeberg, et al., 2012), there still appears to be a gap between the technology available in classrooms and teachers' use of this technology for educational purposes (Kopcha, 2012; Petko, 2012; Zhao, Pugh, Sheldon, & Byers, 2002; Ten Brummelhuis & Kuiper, 2008; Bate, Day, & Macnish, 2013). Being able to use technology wisely and creatively to support teaching and learning is a fundamental aspect of teachers' professional competence today. Nevertheless, studies have found that many teachers still lack the skills and knowledge needed to be able to teach with technology (Angeli & Valanides, 2009), and that there is a mismatch between the digital challenges that newly qualified teachers meet in their profession and the training provided during teacher education (Gudmundsdottir, Loftsgarden, & Ottestad, 2014).

Teacher education has a dual purpose of helping pre-service teachers' develop their own digital competence and the professional digital competence they need in order to facilitate pupils' learning. Research has shown that pre-service teachers' experience with technology from teacher education programmes influences how they later choose to use technology in their teaching (Drent & Meelissen, 2008; Agyei & Voogt, 2011). Consequently, teacher education is regarded a natural place to start incorporating technology into education (Kay, 2006), and teacher educators have an important responsibility to contribute to providing pre-service teachers with a strong foundation for their role as teachers:

> Formal teacher training forms the basis for the professional development of teachers' and student teachers' understanding of teaching and assessment, an understanding that is developed further through practising as a teacher. In working with the subjects and subject didactics and in the education science subject, the teacher-training institutions have a major responsibility to give their student teachers knowledge about what promotes learning in a teaching situation, and how they as teachers must reflect on their own practice to improve, both on their own and with colleagues (NOU, 2015: 8, p. 77)

Teacher education programmes are, however, criticized for their failure to provide pre-service teachers with the necessary experiences of how to utilize technology in a teaching practice (Chien, et al. 2012, Wilhelmsen, et al. 2009, Tømte, Kårstein and Olsen 2013, Montgomerie and Irvine 2001). Past research have also concluded that pre-service teachers do not feel adequately prepared to teach with technology (Kay, 2006; Tømte C. E., 2013). Therefore, a main goal for this thesis is to gain knowledge about use and integration of technology in initial teacher education programmes in Norway, and how development of pre-service teachers' professional digital competence is attended to within this context.

1.1 Research questions, purpose and contribution

The study is based on the premise that technology is now widely available in most classrooms in Norway, and that digital competence is considered a cross-curricular competence for pupils in school. Teachers' digital competence is seen as a decisive factor for whether pupils will be able to

develop this competence, which in turn places an extra responsibility on teacher education institutions to provide pre-service students with the necessary knowledge about what promotes learning (NOU, 2015: 8). The overall purpose of the study is therefore to gain knowledge about how technology is integrated and used in initial teacher education, and to contribute to generating a better understanding of how teacher education programmes contribute to developing pre-service teachers' professional digital competence. The area of research is approached with the following overarching research question:

> *How do initial teacher education programmes in Norway attend to integration of technology and development of pre-service teachers' professional digital competence?*

In order to examine this further, the main research question has been operationalized into three sub-questions which have been addressed in three phases of a mixed methods study:

1. Which knowledge areas of digital competence are addressed in national and local curriculum documents, and how?
2. What opportunities for appropriation of digital competence does teacher education offer?
3. How is professional digital competence integrated in initial teacher education?

Each of the questions has been examined individually through a separate sub-study, and the findings from these studies are discussed in three articles. In order to give the reader an impression of the content of the study I choose to give a brief overview (Table 1) of each of the three articles before I continue to present the research context and aim of each of the three sub-studies.

Table 1 Overview of the thesis and the three articles

Aim of the PhD-project	The aim of the study is to gain knowledge about use and integration of technology in initial teacher education programmes in Norway, and how development of pre-service teachers' professional digital competence is attended to within this context.		
Research question	How do initial teacher education programmes in Norway attend to integration of technology and development of pre-service teachers' professional digital competence?		
	Article 1	**Article 2**	**Article 3**
Title	Preparing pre-service teachers to integrate technology: An analysis of the emphasis on digital competence in teacher education curricula	Appropriation of Digital Competence in Teacher Education	Educating digital competent teachers: A study of integration of professional digital competence in teacher education
Research question(s)	Which knowledge areas of digital competence are addressed in national and local curriculum documents, and how?	What opportunities for appropriation of digital competence does teacher education offer?	How is professional digital competence integrated in initial teacher education? 1. How do teacher educators perceive their own digital competence, and how is this related to workplace support and their pedagogical efficacy? 2. How do mentor teachers' perceive their own competence, what they emphasize for students, and how do they perceive the emphasis of digital competence in teacher education? 3. How do pre-service teachers perceive the emphasis on digital competence in teacher education?
Aim of the study	To explore how teacher education intends to prepare pre-service teachers to use technology in their future classrooms.	To explore opportunities for appropriation of digital competence in teacher education.	To explore further how teacher educators, pre-service teachers and mentor teachers perceive integration of digital competence in teacher education, and to produce added knowledge about the relationship between teacher educators digital competence, workplace support and pedagogical efficacy.
Design	Qualitative content analysis	Multiple-case study	Survey study
Sample	Curriculum documents	Teacher educators Pre-service teachers	Teacher educators Pre-service teachers Mentor teachers

	Article 1	**Article 2**	**Article 3**
Data	Official curriculum documents Programme descriptions from 19 HEIs	Semi-structured interviews with nine teacher educators Focus group interviews with 14 pre-service teachers	Three questionnaire surveys; 654 pre-service teachers, 387 teacher educators and 340 mentor teachers
Analytical and theoretical concepts	TPACK, Digital Competence model, technology proficiency, pedagogical compatibility and social awareness.	Sociocultural perspective, mastery and appropriation	Barriers to technology integration, self-efficacy
Findings	The findings from sub-study one indicate that technology does not have a prominent position in neither national, or local curriculum documents.	One of the main findings in sub-study two is that, although the two cases were initially selected due to their potentially contrasting situations in terms of technology integration, the same conflicts are found in both institutions, the same challenges are found in both institutions: the conflict between mastery and appropriation, and between personal and educational use of technology, and the resistance towards technology among some teacher educators.	The results from sub-study three show that teacher educators perceive their own digital competence at about the mid-point of a 6-point scale. Teacher educators' self-reported efficacy is found to correlates positively with digital competence. Pre-service teachers are critical of the teacher education programme's emphasis on digital competence but favourable towards their own competence. This leads us to conclude that there is a need to explore further how leadership can influence integration of digital competence among teacher educators.

The thesis reports from a multiphase mixed methods study with three sub-studies/phases. Each of the sub-studies is presented and discussed in an article, while the overall research question is discussed in this thesis.

In the first sub-study, the research context is curriculum documents for teacher education. The research question sets out to examine to what extent use of technology is integrated in national and local curriculum documents for teacher education in Norway. According to the national curriculum regulations for the differentiated primary and lower secondary teacher education programmes (1-7 and 5-10) all subjects are equally responsible for contributing to developing student teachers' knowledge of how the subject may contribute to the learning of basic skills (Ministry of Education and Research, 2010). The question was designed in part to explore variations and the uniqueness of different teacher education institutions in Norway in terms of intended technology integration. In order to answer this question,

programme descriptions from all teacher education institutions in Norway have been analysed. In a broader sense, the question was designed to provide an overview of which role technology is intended to have in the preparation of future teachers. The analysis therefore seeks to shed light on how digital tools are integrated across the teacher education curriculum. Focus is here directed towards what Goodlad, Klein and Tye (1979) refers to as *the formal curriculum level*, the second out of five curriculum levels describing the journey from ideological curriculum ideas (*ideal* and *formal* curriculum) towards an actual realization in the classroom by teachers (*perceived* and *operational*) and students (*experiential* curriculum). Levin (2008) defines curriculum documents as the "official statement of what students are expected to know and be able to do" (Levin, 2008, p. 8). The word *expected* is a keyword in this context. An analysis of curriculum documents cannot give us any knowledge about the actual situation. It can, however, give us an overview of the expectations and intentions towards the use of technology in teacher education, and thus provide us with an understanding of the background for what is actualized in the classroom. My hypothesis is that clear descriptions of what pre-service teachers are expected to know and be able to do in relation to use of technology and development of professional digital competence can contribute to increasing the opportunities for appropriation of digital competence. On the other hand, a potential lack of technology integration on a formal curriculum level may not be reflected on the perceived, operational and experiential levels, which means that there may be a potential gap between the curriculum levels. Therefore, my contribution in this context is to produce knowledge that can help bridging this potential gap.

The second sub-study takes us to the *perceived*, *operational* and *experiential* curriculum levels (Goodlad, Klein, & Tye, 1979), seeking to investigate how teacher educators and pre-service teachers perceive opportunities for appropriation of digital competence within their teacher education institutions. While the first question seeks to provide an overview of the intended role of technology and digital competence on a curriculum level, the second question is explored through a multiple-case study of two institutions, exploring opportunities for appropriation of professional digital competence as seen from teacher educators' and pre-service teachers' perspective. The study is

placed within a sociocultural context, with particular focus on learning and Wertschs (1998) distinction between *mastery* and *appropriation.*

The last sub-study also reports from the *perceived*, *operational* and *experiential* curriculum levels (Goodlad, Klein, & Tye, 1979). The aim of the third question is to explore further how teacher educators, pre-service teachers and mentor teachers perceive integration of digital competence in teacher education, and to produce added knowledge about the relationship between teacher educators digital competence, workplace support and pedagogical efficacy.

1.2 Background and research context

The research context for this thesis is Norwegian teacher education programmes for primary and secondary education. The particular focus in this study is on the teacher education programmes introduced in 2010. New demands on teachers, along with an overall concern regarding Norwegian pupils' performance in international surveys and national tests had long called for increased demand for change within teacher education. As a results, the White Paper number 11, *The teacher. The role and the education* (2008-2009) marked the foundation for a new teacher education reform in Norway (Ministry of Education and Reseach, 2009), effective from august 2010.

The new teacher education programme for primary and secondary teacher education was split into two separate streams, qualifying respectively for teaching in grades 1-7 or 5-10. Hence, primary and lower secondary teacher education programmes were defined as two separate education programmes. The aim of the new programmes was to have a stronger emphasis on subject knowledge and teaching skills, quality of study and research orientation (Ministry of Education and Reseach, 2009). In grades 1 to 7, emphasis was placed on beginner-level instruction, with Norwegian and mathematics as compulsory subjects, while grades 5 to 10 did not have any compulsory school subjects. Student teachers would normally choose three school subjects consisting of 60 credits, with an option to specialise in a specific area such as science subjects, language subjects or practical-esthetical subjects. Common for both steams was the new and expanded educational science subject, pedagogy and pupil-related skills, which was compulsory for all students. The

subject consisted of 60 credits and contained subject didactics and teaching practice in all subjects. This structure was meant to secure a focus on the teaching profession and coherence between the various parts of the programme and form the scientific basis for teacher education. (Ministry of Education and Reseach, 2009). As an integrated part of all subjects in the programmes, teacher education institutions were obligated to ensure that pre-service teachers were offered at least 100 days of teaching practice. At least 60 of these should be offered during the first and second year of the programme, while the remaining 40 days were to be offered during the third and fourth year.

Teacher education in Norway is regulated by national curriculum regulations, providing an overarching policy for the differentiated teacher education programmes. In addition, a set of national guidelines supplement the regulations and provide a guiding framework for the institutions' programme descriptions. On the basis of the national curriculum regulations, each institution develops its own programme descriptions for compulsory and elective course modules. Thus, due to the high level of academic autonomy, each institution can determine what knowledge, skills and general competences they regard as essential elements of teachers' professional competences.

Teacher education qualifies for work in schools, but this work is also changing character. In June 2013 a committee was appointed by the Norwegian Government to assess subjects in primary and secondary education in regards to which competences society and working life will need in the future. Two years later, in June 2015, the recommendations from the committee were presented in the Norwegian Official Report (NOU) *The school of the future; Renewal of subjects and competences* (NOU, 2015: 8). In the report four new competence areas are recommended: 1) subject-specific competence, 2) competence in learning, 3) competence in communicating, interacting and participating, and 4) competence in exploring and creating (NOU, 2015: 8, p. 9). It is further emphasized that to prepare pupils for the complexity of society, digital competence is necessary:

> As knowledge is continuously renewed, pupils must be able to develop and refine what they learn in the subjects later in life. Learning the scientific methods of the subjects, the ways of thinking, concepts and principles may give pupils competence which will be relevant over time, and provide tools for understanding how specialised knowledge changes. Digital communication tools and other technologies will be involved in a high number of situations, so pupils need to develop digital competence as part of their subject competence (NOU, 2015: 8, p. 22).

The committee recommends that digital competence should be an integral part of what pupils should learn in and across all disciplines (mathematics, natural science and technology, languages, social studies and ethics, and practical and aesthetic subjects). Hence, in addition to being part of pupils' subject specific competence, digital competence and digital tools is also seen as cross-curricular competence relevant across the disciplines, as well as being part of other cross-curricular competences such as critical thinking, communication and collaboration. It argues further that the competence and practice of teachers are decisive factors for whether pupils will be able to develop these competences, and it is therefore emphasized that there is a need to strengthen teachers' didactic and subject didactic competence, and methods for teaching. Because digital competence is emphasised as a central part of pupils' subject-specific competence, and due to the technological development and digitalisation in society which will lead to a change in content and working methods within each subject discipline, teacher education needs to continuously develop its curriculum and its practices. In this thesis I will take a closer look at how one aspect of change is inflected, namely the integration of technology.

1.3 Conceptual notes

In the thesis there are some key concepts that need to be defined. First of all, the concepts digital tools, information- and communication technology (ICT), educational technology and technology have been used interchangeably throughout the articles (Article 1-III) and in the extended abstract. These concepts are all used to refer to technology used for teaching. The concept *digital tools* is used in earlier policy documents as an English translation of the Norwegian concept *digitale verktøy,* which was used in relation to the five

basic skills (the ability to express oneself orally, the ability to read, numeracy, the ability to express oneself in writing, and the ability to use digital tools) introduced in the Knowledge Promotion Reform (Ministry of Education and Research, 2006a). In more recent documents this has to a great extent been replaced with *digital competence* or *digital skills*. These concepts will be discussed further in Chapter 3.

The concept *pre-service teacher* is understood as a student enrolled in an initial teacher education programme, who has not yet graduated. This concept is also commonly used to describe a student involved in teaching practice. However, in the third article (Article III) we use the concepts *students* and *pre-service* teachers interchangeably. In the rest of the thesis, the term *student* is primarily used to refer to the children in school (grades 1 through 10) or to students in other branches of higher education.

A *teacher educator* is understood as a teacher on campus, teaching in a teacher education institution. In the third article (Article III) we refer to two groups of teacher educators; teacher educators on campus and teacher educators who work with pre-service teachers during their teaching practice periods. While the first group is referred to as teacher educators, the latter is referred to as mentor teachers.

At the very core of the thesis are the concepts of *digital competence* and *professional digital competence*, which are discussed in chapter 3. Digital competence can, according to Ferrari (2012), be broadly defined as:

> the confident, critical and creative use of ICT to achieve goals related to work, employability, learning, leisure, inclusion and/or participation in society. Digital competence is a transversal key competence which, as such, enables us to acquire other key competences (e.g. language, mathematics, learning to learn, cultural awareness). It is related to many of the 21st Century skills which should be acquired by all citizens, to ensure their active participation in society and the economy (Ferrari, 2012, p. 2).

In this thesis digital competence is understood as the knowledge, skills and attitudes required to be able to use technology reflectively for a number of different activities in a number of different contexts in life (Instefjord, 2014). For a teacher, digital competence is understood as "the teacher's ability to use

ICT in a professional context with good pedagogic-didactic judgement and his/her awareness of its implications on learning strategies and on the digital Bildung of pupils" (Krumsvik R. J., 2009, p. 177). This is also referred to as a professional digital competence for teachers, which is defined as a profession-based digital competence relevant to teaching (Ottestad, Kelentric, & Gudmundsdóttir, 2014; Kelentrić, Helland, & Arstorp, 2017; Lund, Furberg, Bakken, & Engelien, 2014). The content of this concept will be further elaborated on in section 3.3.2.

1.4 Structure of the thesis

The thesis consists of two parts; an extended abstract and three articles. The extended abstract (Part I) consists of five chapters. In the first chapter the purpose, research questions and contribution of the study have been described and an overview of the three articles and their respective research questions has been given.

Chapter two provides a background of relevant international and Norwegian research on the use of technology in education. This research is discussed in relation to the demands for use of technology in school and research on development of pre-service teachers' professional digital competence.

In the next chapter the theoretical foundations of the thesis are presented. A sociocultural perspective on learning is chosen as the main theoretical foundation, with particular focus on learning as a process of mastery and appropriation. The third chapter also contains a theoretical presentation of the notions digital competence and professional digital competence for teachers.

The fourth chapter describes the methodology and methods used in the study. Mixed methods research is selected as the main methodological approach. In the chapter the characteristics of this approach are presented, along with a description of the design and methods. The chapter is completed with a reflection on the reliability, validity and generalizability of the study, as well as a discussion of research ethics.

The results of each of the three sub-studies are presented in three separate articles. In the fifth chapter these articles are summarized and discussed. Next,

the findings from each of the articles are discussed further in relation to the overall research question, before the thesis is closed with a discussion on implications and limitations, and some final conclusions are drawn.

The second part of the thesis (Part II) consists of the three published research articles (Article I-III).

2 Background and relevant research

In this chapter I will give an overview of previous research that is considered relevant for the study. The main intention of the chapter is to situate my thesis within the national- and international landscape of research on the use of technology in education and learning. As each of the three articles in the thesis contains its own review sections, the present chapter is intended to combine and extend on these. A thorough literature review of existing research within the field of study is a foundation and pre-condition for doing good research (Boote & Beile, 2005). According to Creswell (2009), a literature review can serve several purposes. First, it contributes to sharing the results of related studies with the readers. Further, it fills in gaps and relates the study to the ongoing dialogue within the field of study, and, finally, it provides a foundation for establishing the significance of the study as well as a point of reference for comparing the results with other findings (Creswell, 2009, p. 25).

Creswell recommends following a five-step process when doing a literature review; 1) *Identify key terms* to use in your search for literature; 2) *Locate literature* about a topic by consulting several types of materials and databases, including those available at an academic library and on the Internet; 3) *Critically evaluate and select the* literature for your review; 4) *Organize the literature* you have selected by abstracting or taking notes on the literature and developing a visual diagram of it; 5) *Write a literature review* (Creswell, 2012, p. 81).

The main focus of my study is integration and development of professional digital competence in teacher education. However, given that the overall responsibility of teacher education institutions is to educate good teachers, teacher education cannot be studied in isolation without also looking at what goes on in school. Thus, in order to situate my study in a larger context, there is also a need to give a brief overview of research on use and integration of technology in school. Therefore, the key terms identified for my study covers both of these areas. The inclusion and exclusion criteria for the search can be found in the table below (Table 2):

Table 2 Literature search criteria

	Included	**Excluded**
Databases	ERIC, ISI Web of Science	PubMed, PsychInfo
Search terms	Digital competence, professional digital competence, digital literacy, ICT competence, basic skills, teachers as role models, teacher education, pre-service teachers, TPCK, ICT in education, integration of technology, effects of ICT	
Time frame	2006-2017	Literature published before 2006
Publication type	Peer-reviewed articles, books, book chapters, frameworks, reports, surveys, steering documents, and white papers	Newspaper articles, BA and MA theses, conference proceedings
Focus	Articles with primary focus on development of digital competence for students (grades 1 through 10) and pre-service teachers, professional digital competence, and use and integration of technology in school and initial teacher education.	Development of digital competence in other branches of higher education Use of technology in preschool E-learning courses Informal learning
Language	English, Norwegian, Danish, and Swedish	All other languages

As the table illustrates I have carried out an extensive literature search in a broad spectre of academic journals, books, reports and so on. Concerning the time frame, I have chosen to only include studies published after 2006, as this was the year the Knowledge promotion reform (Ministry of Education and Research, 2006a) was introduced. Due to the complex nature of my study I found it rather challenging to identify search terms that were broad enough to cover all aspects of my study and narrow enough to exclude results that were not relevant. Therefore, in order to locate literature about the topic I ended up doing more manual searches than I had initially planned, searching systematically through volumes of relevant journals, as well as following references from one article or book to another.

As such, the aim of this chapter is not to provide a complete and systematic literature review of all existing research within the area of interest, but to give an overview of areas of previous research that are considered relevant for my study. The chapter is organised in two sections. First, I will present and

discuss research on use and integration of technology in school. Knowledge about this area constitutes the basis for understanding the relevance of studying digital competence as a part of teachers' professional competence. I will then continue to give an overview of research which focuses on development of professional digital competence in teacher education.

2.1 Use and integration of technology in school

In the introduction I raised a question and some answers to why teachers need to know something about teaching with technology. Additional answers to this question could also be found in the results from some of the studies carried out both in Norway and internationally on technological development and trends among young people. While studies have shown that children's access to and use of technology has increased (The Norwegian Media Authority, 2016), more and more studies also focus on the negative impact of technology use on young people, such as cyber-bullying (Antoniadou & Kokkinos, 2015; Kubiszewski, Fontaine, Potard, & Auzoult, 2015), discomfort from use of technology (Palmer, Ciccarelli, Falkmer, & Parsons, 2014; Scherer & Hatlevik, 2017) or distraction of technology causing negative impact on students classroom performance (Langford, Narayan, & Von Glahn, 2016). Critics have therefore called for a more nuanced debate about the purpose of technology in education, and have questioned "For what purposes would we want to see more use of 'learning technologies'" (Beck, 2011, p. 284). An easy answer to this question may be that we do not want to see *more* use; we want to see *better* use that contributes to overcoming some of the negative impacts. In this section I will therefore give a brief overview of studies that can give some insight into availability of technology in school, how much teachers and students use is, and what they use it for. As a final point I will look at studies that say something about the effect of technology on learning outcomes.

The Norwegian results from the IEA International Computer and Information Literacy Study (ICILS) show that 75% of the students report using a computer at home on a daily basis (Ottestad, Throndsen, Hatlevik, & Rohatgi, 2014). These results are supported by a Norwegian national survey from 2016 on children and media, which shows that 85 % of children between the age of 9

and 16 have access to PC/Mac and tablets at home, and 97% of them also have access to a mobile phone (The Norwegian Media Authority, 2016). These figures add to the results found by OECD in 2012, showing that 99.1% of Norwegian 15 year-olds report to have access to at least one computer at home, which is above the OECD average of 96.5% (OECD, 2015). This indicates that a majority of Norwegian children grow up with technology around them and have good access to all sorts of technology at home. The results also show that a majority of the children now spend more time surfing the internet, using social media and playing with their mobile phones, than spending time with friends (The Norwegian Media Authority, 2016).

On the other hand, while the results from the Norwegian Media Authority (2016) and the ICILS Study (Ottestad, Throndsen, Hatlevik, & Rohatgi, 2014), show that a majority of students have access to and use technology at home on a daily basis, the same studies indicate that technology is less frequently used in school. Lack of access to technology and limitations of both hardware and software have been found to be among the most significant barriers to integration of technology in school (Goktas, Gedik, & Baydas, 2013). Other barriers to technology integration, such as lack of competence and support, and teachers' attitudes towards technology are discussed further in Chapter 3, as well as in Article III. However, international research shows that that many schools now have good access to computers and necessary technology infrastructure (European Commission, 2013; British Educational Communications and Technology Agency (BECTA), 2010; OECD, 2015). In 2012/2013, the ratio of students per computer in primary and lower secondary school in Norway was 2.75, which can be seen as an indication of relatively good access to technology (Norwegian Directorate for Education and Training, 2012/2013).

The study by the Norwegian Media Authority (2016) does not give any figures about access to technology in school or what the technology is used for. It does, however, state that about half of the children report that they do *use* the internet, PC/Mac, learning platforms, mobile phones and tablets in school, while social media and computer games are less frequently used. In the ICILS study it was found that only 8% of the students report using computers in school on a *daily* basis, while 52% of the students report using computers in school on a *weekly* basis (Ottestad, Throndsen, Hatlevik, &

Rohatgi, 2014). When asked about use of computers in specific subjects, Norwegian students report that Norwegian is the subject where computers are used the most, while mathematics is the subject where computers are used the least. Despite the fact that students' use of computers in school subjects is significantly lower than the international mean score in all subjects, the results further indicate that Norwegian students score well above the international average on computer and information literacy (Ottestad, Throndsen, Hatlevik, & Rohatgi, 2014). Moreover, in contrast to the relatively low figures found in relation to use of computers in school, a high percentage (between 71 and 88%) of Norwegian students report to have learned important competences in school related to handling information online (e.g. using a computer to present information, referring to sources online, critically evaluating sources found online etc.). While approximately 75% of the students report that they have learned to locate information and communicate online on their own, nearly half of them report that their teachers have taught them how to make documents. This indicates that although they use technology at home on a daily basis, there are still areas of their digital competence that are not necessarily acquired through this use. Thus, students still see school as an important arena for acquiring the competences they need for educational use of technology (e.g. how to make a document).

The extent of use of technology in school has also been explored in a series of large scale studies conducted by The Norwegian Centre for ICT in Education between 2003 and 2016. In the longitudinal studies, carried out in 2003, 2007, 2009, 2011, 2013 and 2016, as well as the qualitative studies carried out in 2010 and 2012, the digital skills of students in the 7th and 9th grade, and upper secondary level 2 have been studied in relation to their attitudes towards ICT, use of ICT, selection and development of teaching strategies and learning outcomes (Egeberg, Hultin, & Berge, 2016). According to Monitor 2016 (Egeberg, Hultin, & Berge, 2016), four hours a week is seen as the number of hours necessary for achieving the curriculum's competence aims. The results of the 2016 study show that there has been an increase in 7th graders use of technology in school from 2013 to 2016. While 23% of students in the 2016 study report using technology four hours or more at school during a week, the corresponding figure for teachers is 38%. Hence, seen in relation to the results from the ICILS study (Ottestad, Throndsen, Hatlevik, & Rohatgi, 2014), these

figures indicate a slight increase in teachers' use of technology from 2013 to 2016.

The research reported above show that there now appears to be fairly good access to ICT in schools and at home in Norway and many other countries across the world (e.g. The Norwegian Media Authority, 2016; Egeberg, Hultin, & Berge, 2016; British Educational Communications and Technology Agency (BECTA), 2010; OECD, 2015). Nevertheless, studies still report that integration and use of technology in school for educational purposes is still rather limited (Ertmer & Ottenbreit-Leftwich, 2013). Early research on use of technology in Norwegian schools focus to a large extent on the tools themselves, such as how to use Wikipedia (Solvoll, 2008), Blogs (Schwebs, 2006), digital portfolios (Bratholm, 2008), and the extent to which Office-tools are used by students and teachers (Arnseth, Hatlevik, Kløvstad, Kristiansen, & Ottestad, 2007). A similar focus could be found in international research (Lee, 2010). While this body of research provides meaningful information on the potential usefulness of the specific tools per se, there is still a lack of data on how teachers actually use these resources in their teaching to enhance learning:

> Although most teachers have shifted away from implementing classroom activities designed for students to learn about technology, students in today's classrooms still tend to learn from technology, using it primarily as a delivery tool (Ertmer & Ottenbreit-Leftwich, 2013).

The results from Monitor 2016 confirm Ertmer and Otterbreit-Leftwich's observation about the use of technology as a delivery tool. The difference between the number of students (23%) reporting to use technology four hours or more per week, and the corresponding figures for teachers (38%) in Monitor 2016 (Egeberg, Hultin, & Berge, 2016) suggests that teachers are responsible for the majority of technology use in the classroom. In the Monitor School 2016, teachers generally report a high level of digital competence, which is also supported by a test of their digital skills which shows correspondence between their assessment of their own competence and their test on the score (Egeberg, Hultin, & Berge, 2016). However, this aspect of teachers' digital competence is only related to their technological proficiency (Zhao, Pugh, Sheldon, & Byers, 2002), and does not say anything

about their pedagogical competence in the use of technology or integration of technology in specific subjects.

Furthermore, regular use of technology reported by students and teachers may mean only a few minutes of use by students, or extensive use by some and much less by others. Such a variation in use could affect the possible impact that using technology may have on students' learning (Cox & Marshall, 2007). Thus, these figures are not sufficient to be able to say anything about the relationship between use of technology and learning outcomes.

Teachers use of technology and beliefs about the role of technology in teaching and learning have been explored in a number of studies (Saudelli & Ciampa, 2016; González-Sanmamed, Sangrà, & Muñoz-Carrilc, 2017; Ertmer P. A., Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012; Knezek & Christensen, 2008). In a recent study of teachers attitudes towards technology seen in relation to levels of technology integration in school, González-Sanmamed, Sangrà and Muñoz-Carrilc found that teachers in schools where use of technology was integrated had more positive attitudes towards technology, which in turn resulted in increased use and a positive circle that promoted technology use to improve the learning process (González-Sanmamed, Sangrà, & Muñoz-Carrilc, 2017).

The question of whether technology has an impact on learning results has been explored in several studies both in Norway and worldwide. Regarding the effect of technology on learning outcomes in primary and lower secondary school, Cox and Marshall (2007) observe that, "to date we have had no large scale longitudinal studies of ICT's impact such as we have in the form of studies of major curriculum development projects" (Cox & Marshall, 2007, p. 64). Similarly, in a study of research on benefits of ICT in education, Livingstone (2012) concludes that:

> the jury is still out as regards evidence that ICT supports learning. The best that could be said for the role of ICT in the traditional classroom is that, even if ICT is unimaginatively used only to further traditional outcomes, and even if it produces only moderate improvements in basic literacy and science, while also enhancing pupil motivation and compensating for some forms of disadvantage, this would still be a valid enterprise (Livingstone, 2012, p. 19).

In Norway, a large study on the relationship between use of technology and learning outcome in secondary education was conducted in 2012 (Krumsvik, Egelandsdal, Sarastuen, Jones, & Eikeland, 2013). The study involved 17529 students and 2524 teachers in Norwegian secondary schools, and strong correlations were found between students' subject learning outcome and teachers' digital competence. Moreover, the results indicated that teachers who succeeded with their educational use of ICT were characterized by having high digital competence, good classroom management skills, mastered digital formative assessment and were able to adjust their teaching to an increasingly digitalized school context. Hence, an important conclusion in this study was that an increase in digital competence among teachers is one of the most important means for increasing students' learning outcome when technology is used (Krumsvik, Egelandsdal, Sarastuen, Jones, & Eikeland, 2013). Other research studies suggest that use of technology may have a positive impact on students' writing skills. For instance, a study by Engeness and Mørch (2016) on students' writing process in English found that through the use of feedback from an essay critiquing system and feedback from peers students significantly improved their grades:

> In the target class, the feedback from EssayCritic gave content-specific cues and the students included more ideas in their essays than the students in the comparison class who struggled when giving feedback to each other (Engeness & Mørch, 2016, p. 118)

In this regard, the technology was found to be a mediating artefact for student feedback, which in turn contributed to improving students' learning outcomes.

Although these studies are conducted in secondary education there is reason to believe that similar results could be found in lower levels of education. Knowing that a relatively high percentage of the pre-service teachers in the teacher education programme have just finished upper secondary school when they enter teacher education, these studies also contribute to shed light on the context from which many of the pre-service teachers came from before they entered the teacher education programme. This context and the characteristics of its learners will be further explored in the next section.

2.2 Professional digital competence in teacher education

As stated earlier, digital competence is seen as an essential competence for full participation in society (Ananiadou & Claro, 2009). Young people today are expected to be able to know how to use technology for various purposes, and young pre-service teachers are no exception in this regard. People born between 1977 and 1997 are commonly referred to as "digital natives" (Prensky, 2001) or "the Net generation" (Tapscott, 2009). Among the pre-service teachers who started initial teacher education in 2010, only 14% of the students at GLU 1-7 and 9% of the students at GLU 5-10 were more than 30 years old when they started teacher education (The Panel for the teacher education reform, 2011). This means that the remaining 86 and 91% of the students can be seen as belonging to the generation who is "born into the digital world" (Prensky, 2001). Given that they have grown up with technology all around them and have the most up-to-date training, they are seen as most likely to be able to use technology for teaching and learning (Gill & Dalgarno, 2017). Nevertheless, studies have shown that age does not necessarily predict whether a person is as digitally competent as presumed:

> Contrary to the argument put forward by proponents of the digital native concept, generation alone does not adequately define if someone is a digital native or not. […] Nevertheless, generation was not the only significant variable in explaining these activities: gender, education, experience and breadth of use also play a part. Indeed in all cases immersion in a digital environment (i.e. the breadth of activities that people carry out online) tends to be the most important variable in predicting if someone is a digital native in the way they interact with the technology (Helsper & Eynon, 2010, p. 515).

In a review of articles referring to the digital native concept it was found that being digitally competent was not about age but about access, experience and opportunity (Gallardo-Echenique, Marqués-Molías, Bullen, & Strijbos, 2015). Moreover, the authors did not find evidence that supported the general view that digital natives are digitally competent and that the skills they possess can be transferred to the academic environment. Based on their findings they draw the following conclusion:

> Despite their digital confidence and digital skills, their digital competence – the ability to assess and learn from resources – may be much lower than those of their teachers (Gallardo-Echenique, Marqués-Molías, Bullen, & Strijbos, 2015, p. 174) .

Past research has also been conducted to examine the relation between pre-service teachers' use of computers for personal purposes and for pedagogical purposes. For instance, So, Choi, Lim and Xiong (2012) conducted a study to examine pedagogical and technological aspects of pre-service teachers' perspectives towards ICT integration. They found that using computers for personal purposes did not appear to be a strong predictor for prospective computer use, indicating that:

> […] the fluency, propensity, and dispositions toward technology that the Net Generation student teachers show may not be easily translated into their pedagogical practices of using technology as a teacher (So, Choi, Lim, & Xiong, 2012, p. 1243).

From a teacher education perspective, these findings imply that more attention should be devoted to helping pre-service teachers transfer their personal knowledge about technology into teaching practices.

When it comes to access, figures from a national survey on the use of ICT suggest that 86% of students report that they have their own computer (Ørnes, Wilhelmsen, & Solstad, 2011). In a similar study from 2008 covering all teacher education institutions in Norway it was found that all institutions used learning management systems to some extent, and all but one offered helpdesk function for students (Hetland & Solum, 2008). These figures indicate that access to technology is satisfactory for pre-service teachers, and a study from 2013 by The Nordic Institute for Studies in Innovation, Research and Education (NIFU) (Tømte, Kårstein, & Olsen, 2013) confirms that also teacher educators have satisfactory access to technology. However, they also found that some teacher education institutions still report to have a need for more interactive whiteboards and training in how to use these in an educational context.

Despite the relatively good access to technology in higher education, studies have shown that technology is more frequently used in school than in teacher

education programmes (Martinovic & Zhang, 2012; Wilhelmsen, Ørnes, Kristiansen, & Breivik, 2009). Analyses of the literature also demonstrate that there has been a slow uptake of technology in teacher education (Sang, Valcke, van Braak, & Tondeur, 2010; Voogt & McKenney, 2017), and lack of focus on use of technology and development of pre-service teachers' professional digital competence (Hetland & Solum, 2008; Tømte, Kårstein, & Olsen, 2013; Tømte, Hovdhaugen, & Solum, 2009; Tømte C. E., 2013; Wilhelmsen, Ørnes, Kristiansen, & Breivik, 2009).

These findings are supported by a study of the use of technology in Norwegian higher education (Norwegian Agency for Digital Learning in Higher Education, 2015). Although an increased number of educational institutions are found to have placed educational use of technology on the agenda, the activities are in practice controlled by individuals and enthusiasts. Use of technology is only to a small extent rooted in curricula, course descriptions and course requirements, and therefore seemed random in most institutions. Leaders believe that they play an important role in implementing the use of digital tools in teaching and that they are the natural link between strategy and organization. However, their understanding of their own role does not correspond to the interpretations found among their faculty members in terms of degree of involvement in the use of digital tools. Faculty members have a high degree of autonomy in terms of which technology to use and how to use it, and efforts to use technology are still found to be driven by enthusiasts, individual preferences and abilities (Norwegian Agency for Digital Learning in Higher Education, 2015).

The results from the abovementioned study add to the results of past research performed in Norway. In a large qualitative study of conditions and operating parameters for the development of professional digital competence in initial teacher education in Norway, it was found that development of professional digital competence is weakly rooted at the management level of teacher education institutions (Tømte, Kårstein, & Olsen, 2013). The results indicate leaders of most of the ITE programmes were not involved in ongoing efforts to make teacher educators use ICT more actively for educational purposes, and there appeared to be little involvement and support from the leaders in relation to increasing teacher educators' professional digital competence. Moreover, they found that development of digital competence was to a great

extent dependent on individual teacher educators' efforts, and that few examples of integration of professional digital competence could be found in local curriculum documents (Tømte, Kårstein, & Olsen, 2013).

Moreover, research shows that there appears to be a gap between pre-service teachers' technological skills and knowledge about how to use technology for educational purposes (Haugerud, 2011). A number of studies have also found that beginning teachers do not feel adequately prepared to use technology effectively in their teaching (Sang, Valcke, van Braak, & Tondeur, 2010; Tondeur, Roblin, van Braak, Fisser, & Voogt, 2013; Sutton, 2011; Tømte C. E., 2013). Similarly, Martinovic and Zhang (2012) found that although pre-service teachers' self-perceived ICT skills improved significantly during the teacher education programme, less than a third of the pre-service teachers felt that their comfort level with ICT had increased during the programme.

In summary, the abovementioned research has pointed towards a need for increased focus on development of pre-service teachers' professional digital competence during their time in teacher training. As such, a relevant question to ask in this regard is which strategies teacher education programmes use to prepare pre-service teachers to integrate technology in their future classrooms. In the following section I will therefore give an overview of research within this field.

2.2.1 Strategies for preparing pre-service teachers to integrate technology

A number of studies have examined strategies used in teacher education to prepare pre-service teachers to integrate technology in their future classrooms. In a review of 68 journal articles focusing on how technology is incorporated in pre-service teacher education, Kay (2006) identified ten key strategies that were commonly used. When assessing the effects of these strategies, results indicate that none of the strategies can be accentuated with respect to which strategy works best, however using a combination of several of the approaches could lead to an increase in the educational use of technology in the classroom. A similar labelling is made in a more recent review from 2012, focusing on qualitative evidence in studies on integration of technology in

teacher education (Tondeur, et al., 2012). In this review 12 key themes for "which content and delivery methods best prepare pre-service teachers to integrate technology into their future classrooms" are generated (Tondeur, et al., 2012, p. 135). These key terms are in turn divided in two parts: 1) key themes related to preparation of pre-service teachers and 2) key themes related to necessary conditions at the institutional level. The results of the review indicate that in order to effectively prepare pre-service teachers to integrate technology, there is a need to consider the interrelation between the key themes and how they are linked together. Therefore, the authors conclude that in order to successfully prepare pre-service teachers to use technology, teacher education programmes need to address all the key themes identified (Tondeur, et al., 2012). A review by Røkenes and Krumsvik (2014) further unpacks the types of approaches commonly found in empirical studies in regards to development of digital competence for pre-service teachers. In their study they found eight main approaches; "*collaborative, metacognitive, multimodal, modelling, authentic learning, student-active learning, assessment,* and *bridging the theory and practice gap*" (Røkenes & Krumsvik, 2014, p. 267, authors italics).

In this section of my literature review I will build on the strategies identified by Kay (2006). However, I have chosen to group some of the strategies and focus only on the strategies that pertain to the research questions of this study. As such, the number of strategies are reduced from ten to five, by grouping the three strategies related to teaching practice (strategies 6, 7 and 10), as well as the strategies relating to education faculty and modelling (strategies 3 and 5), and excluding the strategies that does not pertain directly to the research questions (strategies 2 and 8). Consequently, I will focus on the following strategies: 1) Integrating technology in all courses; 2) Delivering a single technology course; 3) Modelling how to use technology; 4) Collaboration between teacher educators and mentor teachers, and 5) Improving access to technology. As found in other reviews of studies regarding strategies for preparing future teachers to integrate technology (e.g. Tondeur, et al., 2012; Røkenes & Krumsvik, 2014), most of the studies identified have combined several of the strategies. Hence, some of the studies can be linked to several of the strategies.

The first strategy, "Integrating technology in all courses" is also referred to as an integrated approach or a technology-infused approach (Admiraal, et al., 2014). This strategy aligns with the TPACK framework (Mishra & Koehler, 2006) which will be discussed further in the next chapter (Chapter 3). It is also the strategy most closely related to the technology integration approach found in the Norwegian teacher education programmes, where development of professional digital competence is considered a cross-curricular competence (Ministry of Education and Reseach, 2009; Ministry of Education and Research, 2010). The main advantage of this strategy is that instead of learning about technology in a single technology course, students learn with and through technology in each subject (Kay, 2006; Erstad, 2007; Admiraal, et al., 2014; Wetzel, Buss, Foulger, & Lindsey, 2014). Disadvantages with this strategy is that it demands that all teacher educators have a high professional digital competence in their subject (Tømte C. E., 2013), which has been found to be a challenge in many teacher education institutions (Voogt & McKenney, 2017).

There is also a large body of research which has looked at single educational technology courses as a strategy for developing pre-service teachers' professional digital competence. Such courses typically introduce a range of technological tools that could be applied in an educational context (Gill & Dalgarno, 2017), leaving it up to the pre-service teachers to link the knowledge and skills acquired in the course to an actual teaching practice. Advantages of such a strategy include that the courses are taught by teacher educators with high digital competence (Tømte C. E., 2013), it contributes to developing pre-service teachers' technological proficiency (Hsu, 2012; Zhao, Pugh, Sheldon, & Byers, 2002) and provides a good overview of available educational resources (Kay, 2006). The course can in this way serve as a toolbox for the pre-service teachers, providing a variety of tools that can be pulled out in different situations. In a study of study of pre-service teachers in a 12-week educational technology course in Singapore, Chai, Koh, Tsai and Tan (2011) found that the course was effective for improving the students' technological pedagogical content knowledge (TPACK).

Several researchers have also looked at single technology courses in relation to pre-service teachers' beliefs. For instance, in a study of how an introductory educational technology course began to influence pre-service

teachers' beliefs about technology, Funkhouser and Mouza (2013) found that during the course, pre-service teachers beliefs about technology began to shift from teacher-centred technology use towards a combination of teacher-centred/student-centred technology use. Based on this finding, the authors conclude that "computer experience and successful integration of technology by teacher educators might convince teachers of its benefits and help them see value in using particular technologies" (Funkhouser & Mouza, 2013, p. 271). Ng (2012) reports similar findings about the digital competence of undergraduate students. He examined factors related to students' "attitudes towards the use of ICT and their perceptions of their own level of digital literacy before and after the course", seeking to examine the impact of an educational technology course (Ng, 2012, s. 1069). Results show that the course had positive impact on the students' technical proficiency in terms of creating content and solve technical issues.

The main disadvantages observed in using this strategy are that they are disconnected from methods courses and provide only basic technology skills (Polly, Mims, Shepherd, & Inan, 2010), and that technical skills are taught in isolation and not part of a specific subject (Tømte C. E., 2013), leaving it up to the pre-service teachers themselves to build the connection between technical skills and educational use of the technology (Haugerud, 2011). Studies have also found that although educational technology courses may contribute to developing pre-service teachers' technological proficiency, pre-service teachers express concerns about lack of knowledge about how to integrate technology in specific subjects areas and grade levels (Hsu, 2012).

Modelling how to use technology, the fifth strategy identified by Kay (2006) is another strategy commonly found in research literature in relation to use of technology in teacher education. In explaining the relationship between what goes on in school and what goes on in teacher education, the teacher educator has a prominent role, and modelling by teacher educators is found to be an important means of changing the views and practices of future teachers in relation to educational use of technology (Lunenberg, Korthagen, & Swennen, 2007; Sweeney & Drummond, 2013; Tezci, 2011; Koh, 2011). The importance of this strategy is further explained by Lambert, Gong and Cuper:

> For pre-service teachers, lack of effective modelling can deter the likelihood of their eventual use of these critical teaching tools, and without effective models of technology integration, pre-service teachers tend not to transfer technological skills to their future classroom instruction (Lambert, Gong, & Cuper, 2008, p. 386).

Similarly, in a study among British pre-service teachers, it was found that the extent to which teacher educators modelled use of technology in a persuasive and powerful manner, determined whether pre-service teachers felt prepared to use technology in their first year of teaching (Haydn T. , 2014). Advanced technology skills were found to be less important than effective modelling of technology in regular teaching sessions. Similar results were found by Røkenes and Krumsvik (Røkenes & Krumsvik, 2016). Observational and interview data from their study among pre-service teachers show that modelling by teacher educators and mentor teachers was found to be an effective approach for generating more ideas for how pre-service teachers could integrate technology in their teaching. These findings affirm and exemplify the assertion of Gill and Dalgarno (2017, p. 15) that "lecturer modelling of ICT use also proved to be an influencing factor", and, as a student in their study report, that "her 'big push along' came from seeing lecturers teach using the IWBs, as this gave her ideas about how to ICTs can be used for learning and teaching" (Gill & Dalgarno, 2017, p. 14).

Several studies have also focused on the significance of mentor teachers as role models for the use of technology in teaching and learning. For instance, Haydn and Barton (2007) found that observing a mentor teacher use technology proved to be an important motivator for trainee teachers own use of technology. Similarly, trainee teachers in Barton and Haydns study mentioned that modelling of instructional technology by a mentor teacher was vital for their use of technology (Barton & Haydn, 2006). The importance of ICT use for teaching during teaching practice is also emphasised by Gill and Dalgarno (2017). In a study of the development of pre-service teachers' Technological Pedagogical and Content Knowledge (TPACK) over a four year teacher education programme, they found that availability of ICT resources during teaching practice was among the major influencing factors. This emphasises that pre-service teachers' need experience with and exposure

to technology used for teaching and learning during their teaching practice in order to develop their professional digital competence.

The importance of collaboration between teacher education programmes and mentor teachers during teaching practice is emphasised by Hsu (Hsu, 2012). To keep pre-service teachers updated on emerging technologies as well as technologies commonly used during teaching practice, Hsu suggests that professional development activities should be offered regularly during teacher training. This can be accomplished by focusing on collaboration between pre-service teachers, teacher educators and mentor teachers:

> Second, it is essential that educational technology faculty, methods course faculty and school teachers collaborate to develop technology-integrated teacher education curricula that help pre-service teachers to develop TCK (Hsu, 2012, p. 210)

The final strategy examined in this section of my literature review is related to access. As discussed in Article III, lack of access to technological resources, training and support, are found to be among the *external* barriers to technology integration (Ertmer P. A., Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012). A number of researchers have investigated increase of access to technology (hardware/software) and/or support as a strategy for preparing pre-service teachers to integrate technology in their future classrooms. Kay argues that without satisfactory access, other strategies have limited effect (Kay, 2006). Nonetheless, as confirmed by Kay, it should be noted that: "providing software, hardware, and support is critical, but other strategies will have to come into play if technology is to be used in a meaningful and effective manner" (Kay, 2006, p. 392). Therefore, this strategy will be discussed further in the next chapter (Chapter 3) in relation to other commonly found barriers to technology integration.

3 Conceptual and theoretical foundation

In this chapter I will present and discuss the theoretical and conceptual foundation of my thesis. As briefly mentioned in the introduction I see the development of pre-service teachers' professional digital competence as something that takes place within a sociocultural environment. On a fundamental level, development of professional digital competence is about learning. *Learning* is here seen in light of Somekh's (2008) understanding of learning as a situated process being mediated by the context of the classroom, school and larger society, while *knowledge* is seen as something that first exists in the interaction between humans and then becomes a part of each individual and his and her actions (Säljö, 2000).

This view of learning and knowledge places the thesis within a sociocultural approach to learning, and in this chapter the theoretical foundation of the thesis will be presented seen from a sociocultural perspective. I will begin by presenting this perspective and how it has influenced my work. Second, I will provide a short overview on how educational technology has developed within the context of curriculum documents for primary and secondary schools as well as for teacher education during the last 30 years. In the final section I will explore the development of the concept professional digital competence and how this concept is understood today. As such, the main concepts discussed in this chapter are sociocultural perspectives on learning, technology integration and development of professional digital competence.

3.1 Sociocultural perspective on learning

A sociocultural perspective on learning is concerned with how people acquire knowledge and are shaped by participating in cultural activities (Säljö, 2000). This perspective builds on research traditions such as anthropology, linguistics and sociology, traditions that focus on understanding culture, language and other aspects of social behaviour. The view is strongly influenced by Vygotsky's understanding of learning as a result of communication and participation, which underlines the role of language within a sociocultural perspective on learning. By interacting with other people we observe, describe and interpret the impressions we are exposed to,

and new knowledge is developed as a result of these processes. In this way, knowledge is seen as something that is constructed through interaction and in a context, and not primarily through individual processes (Dysthe, 2001). Thus, knowledge does not exist in a vacuum, but is a result of a process that is created and situated in an activity and in a historical and cultural context (Dysthe, 2001, p. 36).

Vygotsky describes learning as a process that occurs on two levels; first on the social or inter-psychological level, and second on a personal or intra-psychological level (Vygotsky, 1978; Säljö, 2000). This is what Vygotsky refers to as internalization; the process of making someone else's attitudes, behaviour, language or tools of thought fully part of one's nature or mental capacity. This body of knowledge first exists outside the learner, and through language and other *mediating* artefacts (Vygotsky, 1978; Säljö, 2006) we interpret the impressions we are exposed to and use them as resources in future situations (Säljö, 2000). The concept of *mediation* implies that everything we experience in the world is interpreted through physical and intellectual tools that are integrated parts of our social practices. Within a sociocultural perspective these tools are referred to as *cultural artefacts*: signs, symbols and tools.

These artefacts are crucial of the cultural resources we use in our everyday lives. We are surrounded by technology; from mobile phones, to computers, cars and television, and all these technologies influence the way we work, communicate and learn. Säljö (2000) refers to these technologies as man-made artefacts that are outside our bodies but still influence our intellectual processes:

> But if we try to understand thinking, use of concepts and learning as parts of human activity (rather than something by itself), we can immediately see that our actions in most situations are closely related to different kinds of tools (Säljö, 2000, p. 76, my translation).

By using various physical and intellectual tools, we are able to solve problems and master social situations in ways that would not have been possible without the support of cultural artefacts. Artefacts carry with them a history of use and are altered, shaped and transformed when employed in activities (Säljö, 2000)

Vygotsky's use of the term internalization for describing the process of learning how to use artefacts has been broadly disputed by other sociocultural researchers, for instance Wertsch (1998), Rogoff (1990; 1995) and Säljö (2000; 2006), due to its tendency to be misleading. Instead they propose to use the terms *mastery*, *knowing how* (Wertsch, 1998) and *appropriation* (Rogoff, 1995; Wertsch, 1998; Säljö, 2006) when analysing the process of learning to use cultural tools or artefacts.

Drawing on the writings of Bakhtin, Wertsch suggested that appropriation is used as a translation for the Russian terms *prisvoenie* or *prisvoi* which, according to Wertsch, means "to bring something into oneself or […] the process of making something one's own" (Wertsch, 1998, p. 53). Based on these translations he defines appropriation as a process "of taking something that belongs to others and making it one's own" (Wertsch, 1998, p. 53). Wertsch distinguishes between the *mastery* of a cultural artefact and the *appropriation* of a cultural artefact. The first refers to knowing *how to* use an artefact, while the latter refers to "the process of taking something that belongs to others and make it one's own" (Wertsch, 1998, p. 53).

If we see learning and development as mastery and appropriation of cultural artefacts, these processes stand out as a sophisticated process of coordination between humans and cultural artefacts (Säljö, 2006). Learning begins with an initial contact with something that is not familiar to us. At this stage of the learning process we begin to try out a new artefact and start to investigate the different aspects of how the artefact mediates, and we may require help from others who are more familiar with the artefact. In this way we meet cultural artefacts in specific contexts and may begin to see them as resources for particular types of activities. As we spend more time getting to know the artefact, we learn new ways to use it and we discover new functions that we did not recognize in the beginning. Through these processes we learn to master the artefact in different contexts and it becomes so natural for us to use it that it will eventually be a part of our identity; it becomes appropriated and we will no longer need help from others.

Nevertheless, cultural artefacts are not always easily appropriated, and often a cultural artefact is mastered but not appropriated by the learner. Seen in light of Ferrari's (2012) definition this may mean that aspects of digital

competence, such as being able to use technology to communicate, could be mastered in a particular context such as for socializing with family and friends, but not appropriated by the learner to such an extent that he or she would choose to use it an educational context to create and share content and build knowledge creatively. There may also be situations of appropriation without mastery, where both interest and motivation are strong, but understanding of how to use the cultural artefact is still lacking or unsophisticated (Polman, 2006). Thus, appropriation without mastery refers to "coming to value a practice, but not yet having the competency to carry it off" (Laffey, 2004, p. 377).

According to Wertsch, an important aspect of appropriation is that it always involves some sort of resistance: "In such instances of mediated action, the agent may use a cultural tool but does so with a feeling of conflict or resistance" (Wertsch, 1998, p. 56). In operation, the cultural tool is not part of their identity and they may therefore choose to use it only in situations that demand compliance. In relation to the use of technology in school the concept of resistance is particularly relevant. The awareness of, for instance, the demands in the curriculum or an organisational focus on technology integration may lead to teachers using technology with a strong feeling of conflict or resistance and does not view the artefact as something that belongs to him or his teaching practice. When the level of resistance grows sufficiently strong he or she may refuse to use the cultural artefact all together (Wertsch, 1998).

3.2 Integration of technology

In the first phase of the study we looked at *integration* of digital competence in curriculum documents for teacher education in Norway. According to Goodlad, the ultimate purpose of curriculum development is to improve the knowledge, skills and attitudes of human beings (Goodlad J. I., 1979):

> The intent is to enhance one's ability to find meaning in one's life. There are, then, potential learners who will respond to something called a curriculum, a curriculum they will perceive quite differently from the way it was perceived by all those who had something to do with producing or developing it. In its movement from wherever it had its beginnings to where

> these learners encounter it, this curriculum changed profoundly from whatever it was at the outset (Goodlad J. I., 1979, p. 20).

By focusing on curriculum documents we looked at one of the first steps of this movement, focusing on what Goodlad, Klein and Tye (1979) refers to as *the formal curriculum level*. This is the second out of five curriculum levels describing the journey from ideological curriculum ideas (*ideal* and *formal* curriculum) towards an actual realization in the classroom by teachers (*perceived* and *operational*) and students (*experiential* curriculum). In the second and third phase of the study we directed our focus towards the perceived, operational and experiential curriculum levels.

A central question that should be addressed in this context, which is relevant for all the above mentioned curriculum levels, is what it means to *integrate* technology in a curriculum. In the Cambridge Dictionary, the word *integrate* is explained as "to combine two or more things in order to become more effective", while the Merriam Webster Dictionary defines it as "to form, coordinate, or blend into a functioning or unified whole" or "to incorporate into a larger unit". In an educational context the term *technology integration* has been assigned numerous different meanings, ranging from simply using computers for instruction to incorporating the use of technology in the curriculum for the purpose of improving student achievement (Goodlad, Klein, & Tye, 1979). Belland (2009) defines technology integration as "the sustainable and persistent change in the social system of K-12 schools caused by the adoption of technology to help students construct knowledge" (p. 354).

If we look at integration of technology in the curriculum in light of these interpretations, technology should be seen as a natural artefact for teaching and learning in all subjects and not as something that is added on the outside or taught separately. This view on technology integration is in line with Earle's (2002) understanding of technology integration, linking technology integration to the concept of wholeness, which implies that all elements of the system are connected in order to form a whole (Buabeng-Andoh, 2012):

> For instance, the two important elements of teaching and learning which are content and pedagogy must be joined when technology is used in lesson. In other way, if students are offered series of websites or ICT tools (e.g. CD ROMs, multimedia, etc) then the teacher is not integrating ICT into

> teaching since he/she is not tackling the pedagogical issues (Buabeng-Andoh, 2012, p. 137).

Seen from this perspective, this means that technology should not be taught as a subject of its own, but should be integrated in all subjects across the curriculum as a transversal foundation for all learning (Tondeur, Roblin, van Braak, Fisser, & Voogt, 2013). This is in line with the understanding of digital competence found in the Framework for Basic Skills (Norwegian Directorate for Education and Training, 2012) and the European Reference Framework (European Commission, 2006) which will both be discussed later.

Successful integration of technology in education has been an area of interest to researchers and educators for nearly as long as technology has been available for educational purposes, arriving at several explanations for why technology is still not integrated better in curriculum activities (Zhao, Pugh, Sheldon, & Byers, 2002). First off, Harris, Mishra, and Koehler (2009) explain the lack of technology integration with the nature of how the use of technology has been conceptualized and supported. They argue that current methods for integration of technology are technocentric, focusing too strongly on technology skills and ignoring the complex relationship between technology, content, pedagogy and changing contextual realities. Others, like Ertmer (1999), suggest that lack of technology integration can be explained by barriers that have an impact on teachers' use of technology in the classroom. Ertmer distinguishes between first and second order barriers to change. First order barriers are defined as *external* to the teacher, embracing areas such as access to resources, training, and support, while second order barriers are *internal* to the teacher, including teachers' confidence, beliefs, and perceived value or usefulness of technology (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012).

A similar labelling is found in Drent and Meelissen's (2008) work where they distinguish between non-manipulative and manipulative school and teacher factors. Non-manipulative factors are factors that cannot be manipulated directly by the school, such as teachers' age, teaching experience or computer experience, or governmental policy and the availability of external support for schools. Manipulative factors on the other hand, are, for instance, teachers' attitudes towards technology, their skills in using instructional technology, or

availability of technological support and commitment in relation to implementation of technology in school (Drent & Meelissen, 2008). Similarly, Kopcha (2012) summarizes that five barriers to technology integration are commonly found in research literature; lack of *access* to technology, teachers' *vision* for technology, teachers' *beliefs* about usefulness of technology, required *time* and lack of *professional development* in relation to the use of technology in the classroom (Kopcha, 2012, p. 1109).

Equally, *the will, skill, tool* (WST) model of technology integration (Christensen & Knezek, 2008), was developed specifically to explain the reality of technology integration in educational contexts. The model identifies three key elements for a high level of technology integration; teachers' will to use technology in the classroom (technology attitudes), his or her skills in using technology (digital competence) and having satisfactory access to technology as a tool (access to technology) (Christensen & Knezek, 2008). On the basis of previous research using the WST model, Knezek and Christensen (2008) maintain that 90% of the variance in level of technology integration in the classroom can be explained by these variables. The model also includes student achievement, assuming that teachers' computer attitudes, technology skills, and access to technology have an impact on technology integration, which in turn affects student achievement. Christensen and Knezek (2008) argue that a positive attitude towards computers can be associated with greater computer use. Factors associated with the concept of *will* are thus related to teachers' attitudes towards technology (Morales, 2006, p. 20) and to what Ertmer et. al (2012) refers to as beliefs or internal barriers. Pajares (1992) suggested that attitudes are formed by clusters of beliefs around a particular object or situation, which in turn guide a person's behaviour (Ajzen, 2001):

> When clusters of beliefs are organized around an object or situation and predisposed to action, this holistic organization becomes an attitude. Beliefs may also become values, which house the evaluative, comparative, and judgmental functions of beliefs and replace predisposition with an imperative to action. Beliefs, attitudes, and values form an individual's belief system (Pajares, 1992, p. 314)

In this way, attitude can be seen as the sum of beliefs. A teacher can have many beliefs about using technology, about their self- efficacy as teacher

educators, and about their students, both positive and negative. Ultimately, his or her attitude towards integrating technology in the classroom will be based on the overall evaluation of these beliefs. In an extensive review performed by Mumtaz (2000), attitude and self-efficacy were identified in several studies as important predictors of teachers' use of technology. Teacher self-efficacy has been defined as "their belief in their ability to have a positive effect on student learning" (Ashton, 1985, p. 142). Teachers' attitudes towards technology can also be seen in relation to their perceived usefulness of technology. Studies have found that teachers who are unconvinced about the potential of technology on instructional productivity are less likely to use technology (Mumtaz, 2000; Kim, Kim, Lee, Spector, & DeMeester, 2013; Agyei & Voogt, 2011).

Likewise, teachers' perceived advantages of using computers, their willingness to use technology for information dissemination, and their professional enhancement in the use of computers are assumed to be central indicators of teachers' attitudes towards technology (Petko, 2012). However, as noted by Belland (2009), having positive attitudes towards technology does not necessarily lead to change in behaviour in terms of more or better integration of technology in the classroom. Seen from this perspective, teachers can very well have positive attitudes towards technology, but still choose not to use it in the classroom. This emphasizes that attitude may also be related to a number of other variables that need to be considered.

According to Bandura's self-efficacy theory, *vicarious experience*, or modelling, is one of the four main sources (mastery experience, physiological and emotional states, vicarious experiences, and social persuasion) that "alter efficacy beliefs through transmission of competencies and comparison with the attainment of others" (Bandura, 1997, p. 79). Within a context of teacher efficacy, a vicarious experience refers to an individual observing another individual teach, for instance a pre-service teacher observing a teacher educator or mentor teacher use technology for teaching. The closer the observer identifies with the model, the more likely is it that it will have impact on efficacy. However, vicarious experiences can go both ways – observing a teacher succeed can lead pre-service teachers to believe that they can have the capability to be a successful teacher under similar circumstances, while observing an experienced teachers' failure can lead them to believe that the

task is unmanageable (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). Similarly, the idea of vicarious experiences can also be linked to teacher educators. Modelling by teacher educators is found to be an important means of changing the views and practices of future teachers (Lunenberg, Korthagen, & Swennen, 2007).

Access to technology or *tool,* representing the external barriers to technology integration (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012), is defined as "the self-reported access and extent of use of technology in educational settings and at home" (Morales, 2006, p. 20). In a study, performed by Goktas, Gedik, and Baydas (2013), comparing the status of technology integration in 2005 and 2011, it was found that the prominent barriers encountered in the integration in 2011 were still related to access to technology. Lack of technology and limitations of both hardware and software were found to be the most significant barriers to integration of technology (Goktas, Gedik, & Baydas, 2013).

3.3 From basic skills to professional digital competence

A number of terms have been used in the attempt to conceptualise what kind of competence or competences we need in order to participate fully in today's society, and since I started my journey towards finishing this thesis, a lot of work has also been done in Norway in order to conceptualize the notion *teachers' professional digital competence*, for instance by Lund, Furberg, Bakken and Engelien (2014), Ottestad, Kelentric and Gudmundsdóttir (2014) and most recently Kelentrić, Helland and Arstorp (2017). Similarly, the relationship between technology and pedagogy has been explored by researchers throughout the years, and in the Norwegian context today the term professional digital competence is commonly used to describe what kind of competence teachers need to hold (Ottestad, Kelentric, & Gudmundsdóttir, 2014). In the following section I will discuss this concept along with some important aspects related to the development of teachers' professional digital competence. But before I do so, I wish to give a brief overview of some of the other key concepts that we have encountered nationally and internationally on

the way towards todays understanding of teachers' professional digital competence.

3.3.1 Digital competence for students and learners

The first White paper on use of technology in Norwegian schools was published as far back as in 1983 (Tvedte, 2000). Since then, a number of policy documents have given directions for use and integration of technology in school, and in the White paper number 30 *Culture for learning* (2003-2004) (Ministry of Education and Reseach, 2004) the concept *digital competence* was introduced and discussed in relation to the overarching concept *competence*. *Competence* was here defined as "the ability to master a complex challenge or perform a complex activity or task" (Ministry of Education and Reseach, 2004, p. 31, my translation). This understanding of competence was inspired by OECD's *Definition and Selection of Competences (*DeSeCo) project (Rychen & Salganik, 2001), where competence is understood as "the ability to meet complex demands, by drawing on and mobilising psychosocial resources (including skills and attitudes) in a particular context" (Rychen & Salganik, 2001, s. 4). To elaborate further on what competence comprises, three categories of basic competencies were identified: 1) using tools interactively (e.g. language, technology), 2) interacting in heterogeneous groups and 3) acting autonomously. By focusing on the different categories, the report emphasises that competence should be understood as more than just knowledge and skills.

The White paper referred to above was the funding document for a new curriculum reform, the Knowledge Promotion Reform, which was introduced in Norway in 2006. In this reform, all subjects in primary and lower secondary school were provided with new curricula, focusing on clearer competence objectives and emphasis on basic skills. Five basic skills were defined as basic to learning in school, work and social life. These skills were: the ability to express oneself orally, the ability to read, numeracy, the ability to express oneself in writing, and the ability to use digital tools (Ministry of Education and Research, 2006a). In the English translation of the reform documents, the term *basic skills* was used as a translation of the Norwegian notion *grunnleggende ferdigheter*. The use of the term *skills* is this context is

slightly misleading as it does not embrace all categories of competencies referred to in the broader term *basic competences* used in the DeSeCo report (Rychen & Salganik, 2001). When used in connection with the fifth basic skill, the ability to use digital tools, it appears as if this area of competence is reduced to mere technical skills.

At the same time, in a framework developed by the European Commission, digital competence was recognized as one of the eight key competences for lifelong learning. In the framework *competences* were defined as a "combination of knowledge, skills and attitudes appropriate to the context" (European Commission, 2006, p. 5), while *key competences* were defined as "those which all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment" (European Commission, 2006, p. 5). Although all key competences were considered equally important, the framework emphasised that the fundamental basic skills, language and communication, literacy, numeracy, use of technology, and learning to learn were seen as competences that supports all learning activities and were essential foundations for learning. In the framework, digital competence was given the following definition:

> Digital competence involves the confident and critical use of Information Society Technology (IST) for work, leisure and communication. It is underpinned by basic skills in ICT: the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet (European Commission, 2006, p. 9).

In 2012, a framework for basic skills was developed by the Norwegian Directorate for Education and Training. In this framework, the same skills that were introduced in 2006 were re-formulated as oral skills, reading, writing, digital skills and numeracy (Norwegian Directorate for Education and Training, 2012). Digital skills are given a general definition, as well as being divided into four sub-categories: *Search and process*, *Produce*, *Communicate*, and *Digital judgement*. The framework was developed as a tool for the development and revision of the national subject curricula, and contains definitions of the five basic skills mentioned earlier, descriptions of their

functions at different levels of education and what is required at the different levels.

In an international context, a more recent definition from the European Commission digital competence is defined as:

> the confident, critical and creative use of ICT to achieve goals related to work, employability, learning, leisure, inclusion and/or participation in society. Digital competence is a transversal key competence which, as such, enables us to acquire other key competences (e.g. language, mathematics, learning to learn, cultural awareness). It is related to many of the 21st Century skills which should be acquired by all citizens, to ensure their active participation in society and the economy (Ferrari, 2012, p. 3).

As seen from the above definition, digital competence is perceived as a competence that intertwines many aspects of our lives; it is a competence for work, leisure, and for participating fully in society. In this way, the definition accentuates that although basic skills in ICT is a foundation for digital competence, the concept embraces a lot wider than merely technical skills in the use of ICT. An important consideration in this context is the definition of the terms *skills* and *competence,* and how they relate to each other. One useful distinction between the two terms is provided by the OECD's DeSeCo project:

> A competency is more than just knowledge and skills. It involves the ability to meet complex demands, by drawing on and mobilising psychosocial resources (including skills and attitudes) in a particular context. For example, the ability to communicate effectively is a competency that may draw on an individual's knowledge of language, practical IT skills and attitudes towards those with whom he or she is communicating (Organisation for Economic Co-operation and Development (OECD), 2005, p. 4)

Thus, one of the significant aspects of digital competence as a key competence is its transversal nature. Digital competence can in this sense be understood as a foundation for all the other key competences.

Nevertheless, it is worth noticing that the technical aspects are slightly more accentuated in the early definitions of digital competence than what is found

in more recent definitions. If we compare the two formulations from the Norwegian curriculum; *basic skills* and the *ability to use digital tools*, with the above definitions, we also see that while the European definitions specifies that *skill* is only a small aspect of the broader term *competence*, the Norwegian use of the concepts can be translated into a more limited understanding. This may have contributed to the many attempts within the Norwegian context to extend the understanding of the notion of *ability to use digital tools* beyond its original form, for instance by Krumsvik (2008), Erstad (2010; 2007) and The Norwegian Centre for ICT in Education. In his early writings, Erstad was critical towards the definition of the ability to use digital tools as a basic skill, and argued that a consequence of this was that it was primarily the technical aspects of the use of technology that was emphasised in school (Erstad, 2007). This argument is supported by early research on use of technology in Norwegian schools, which greatly emphasised the technical aspect of digital competence (i.e. how to operate hardware and software).

In a more recent definition of digital competence, Erstad defines digital competence as "skills, knowledge and attitudes in relation to use of digital media required for comprehension in the learning society" (Erstad, 2010, p. 101, my translation). Erstad further suggests that digital competence for students and learners is operationalised through ten core components: 1) Basic skills, 2) Download/upload, 3) Search, 4) Navigate, 5) Classify, 6) Integrate, 7) Evaluate, 8) Communicate, 9) Collaborate, and 10) Create (Erstad, 2010). The ten components move from mastering simple and basic operations towards more complex and multifaceted competences. This definition is founded on a sociocultural perspective on learning, emphasising that digital competence is a cultural and contextual competence depending on "the process by which it is learnt, the purposes for which it is used, and the institutions in which it takes place" (Erstad, 2010, p. 103).

3.3.2 Professional digital competence

Use of technology and the need for digital competence is also commonly debated in relation to many types of challenges found in school today, and policymakers are clearly emphasizing the importance of digital competence in relation to school improvement and classroom and instructional decision

making. Yet, we still struggle to define what it actually means to be a digital competent teacher. Until recently, the field has perhaps focused more on discussing the *lack* of competence or technology instead of actually defining what kind of competence a teacher needs. A number of researchers have, however, attempted to define what being a digitally competent teachers means, for instance Krumsvik (2008; 2009), Mishra and Koehler (2006), and Zhao, Pugh, Sheldon and Byers (2002), and more recently the concept *professional digital competence* was coined as an attempt to define the construct further (Tømte, Kårstein, & Olsen, 2013; Lund, Furberg, Bakken, & Engelien, 2014).

Integration of instructional technology into the curriculum has become an inseparable part of good teaching, and variations in technology use are closely linked to teachers' general teaching expertise (Pierson, 2001). In order to understand and define teachers' technology integration Pierson (2001) introduced the term *technological pedagogical content knowledge* (TPCK):

> A teacher who effectively integrates technology would be able to draw on extensive content knowledge and pedagogical knowledge, in combination with technological knowledge. The intersection of the three areas, or *technological-pedagogical-content knowledge*, would define effective technology integration (Pierson, 2001, p. 427).

The concept has later been adapted by Mishra and Koehler who argue that thoughtful pedagogical use of technology requires the development of a complex, situated form of knowledge (Mishra & Koehler, 2006). Based on the assumption that technology integration should be related to specific subject areas, they added technology as a key component to Shulman's pedagogical content knowledge framework (Shulman, 1986; Shulman, 1987). Similar to Pierson's (Pierson, 2001), three interdependent components of teacher knowledge are incorporated in their framework; content knowledge, pedagogical knowledge, and technological knowledge (Koehler & Mishra, 2008). In the interactions among these bodies of knowledge four other types of knowledge are constructed; technological content knowledge, technological pedagogical knowledge, pedagogical content knowledge, and, finally technological pedagogical content knowledge (TPACK) (Harris, Mishra, & Koehler, 2009).

Koehler and Mishra (2009) argue that teachers' development of a knowledge that embraces an understanding of how content, pedagogy and technology interact, both theoretically and in practice, is critical to effective teaching with technology. Thus, based on the assumption that technology integration should be related to specific subject areas, they have added technology as a key component to Shulman's pedagogical content knowledge framework (Shulman, 1986; Shulman, 1987). In their framework, three interdependent components of teacher knowledge are incorporated; content knowledge, pedagogical knowledge, and technological knowledge (Koehler & Mishra, 2008). In the interactions among these bodies of knowledge four other types of knowledge are constructed; technological content knowledge, technological pedagogical knowledge, pedagogical content knowledge, and, finally technological pedagogical content knowledge (TPACK) (Harris, Mishra, & Koehler, 2009). All these knowledge areas represent important competences for teachers. Nevertheless, the TPACK framework has been criticized for having unclear boundaries (Angeli & Valanides, 2009) and lack of understanding amongst the knowledge areas (Chai, Koh, Tsai, & Tan, 2011). Due to the complexity, the TPACK framework can therefore appear to be less accessible in the discussion of the content of teachers' digital competence.

Although the demands and expectations associated with digital competence in the abovementioned Framework for basic skills (Norwegian Directorate for Education and Training, 2012) are primarily related to students and learners, the demands are highly relevant for teachers. Seen from a curriculum perspective, teachers are responsible for realizing the ideological curriculum ideas, developed on the ideal and formal curriculum levels, in the classroom (perceived and operational curriculum levels). Hence, teachers perception and understanding of the curriculum, in this case the Framework for basic skills, directly influences how they choose to work with technology in the classroom on the operational level. If teachers are to be capable of contributing to developing their students' digital competence in line with the content of the framework for basic skills, they need to have a competence that covers the skills included in the framework, as well as a didactic competence in how to facilitate for students' appropriation of digital competence in a learning context. According to Krumsvik (2008), teachers' digital competence is distinguished from other technology users based on their focus on education

and instruction, in addition to everyday digital competence in using technology for personal purposes such as e-mail, social communication and entertainment. In this connection it is worth noticing that Krumsvik (2008) deliberately chooses to employ the concept digital *competence* rather than digital *literacy*, which was more commonly used internationally at the time of writing, arguing that in a Scandinavian context the concept *competence* embraces a more holistic understanding of teachers' proficiency with the use of ICT: "This means that the focus is directed towards pedagogy and subject matter, while technical skills are only a part of this complex digital competence concept" (p. 280).

As stated earlier, the concept teachers' professional digital competence was coined in 2013 as a contribution to the ongoing discussion about what it means to be a digitally competent teachers (Tømte, Kårstein, & Olsen, 2013; Lund, Furberg, Bakken, & Engelien, 2014; Ottestad, Kelentric, & Gudmundsdóttir, 2014). In 2017 this concept was operationalized further in the "Framework for teacher's professional digital competence" (Kelentrić, Helland, & Arstorp, 2017). The framework was developed as a guiding document for stakeholders involved in improving the quality of teacher education and professional development for teachers, e.g. policy makers, teacher educators, teachers and pre-service teachers (Kelentrić, Helland, & Arstorp, 2017). In the framework, the teacher's professional digital competence is divided into seven competence areas: 1) Subject and basic skills; 2) School in society; 3) Ethics; 4) Pedagogy and subject didactics; 5) Leadership and learning processes; 6) Interaction and communication; and 7) Change and development. The content of these competence areas corresponds to a great extent to parallel frameworks, e.g. "The ICT competency framework for teachers" (UNESCO, 2011) and the "Developing Digital Literacies" framework (JISC, 2014). However, the "Professional digital competence" framework goes further into identifying the core content of a teacher's professional digital competence by providing thorough descriptions of learning outcomes within each competence area, divided into knowledge, skills and general competences. Thus, the sum of these learning outcomes makes up the content of a teacher's professional digital competence.

4 Methodology and research design

In this chapter I will present and discuss the methodology and methods of my study. I have chosen a mixed methods research approach for my study, which combines qualitative and quantitative methods within the same study. I will present and discuss the design I have chosen, including the different methods used for selection, data collection and data analysis, which led to the three articles in my thesis. But before I do so, I will provide a brief introduction to mixed methods research in order to situate my thesis within the methodological landscape.

I will end the chapter with a discussion on how reliability, validity and generalisability, as well as ethical aspects regarding participants, have been attended to throughout the study.

4.1 Mixed methods research

As mentioned in the introduction, mixed methods research has been employed as the methodological approach to the project. The key characteristic of mixed methods research is "the sequential or concurrent combination of quantitative and qualitative methods (e.g., data collection, analysis and presentation) within a single research inquiry" (Venkatesh & Brown, 2013, p. 25). Based on an analysis of definitions on mixed methods research, provided by leading mixed methods research methodologists, Johnson, Onwuegbuzie and Turner (2007) offer the following general definition of mixed methods research:

> Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration (Johnson, Onwuegbuzie, & Turner, 2007, p. 123).

Mixed methods research involves collecting, analysing and interpreting qualitative and quantitative data in a single study (Leech & Onwuegbuzie, 2009). All research is framed by a series of related assumptions about the views of the world and the notions of knowledge within it (Waring, 2012). In

mixed methods research both qualitative and quantitative forms of inquiry are combined. This involves philosophical assumptions, use of both quantitative and qualitative approaches, and a mixing of both approaches in a single study or a multiphase programme of inquiry (Creswell, 2009, p. 4).

The choice between a quantitative and a qualitative research strategy may be considered as pragmatic or originate from a philosophic point of view. In the 1970s, philosophers and sociologists argued that a quantitative strategy was not suited for social sciences. They claimed that a quantitative approach neglected to consider important aspects of human behaviour, and thus argued that these aspects could only be attended to by using a qualitative approach (Ringdal, 2009). Greene (2005) argues that we are experiencing a battle about what is the best and most worthwhile methodology for educational research, and states that a mixed methods approach offers some valuable leverage on the ideological strands of the battle.

This is supported by Zeichner (2005) who asserts that a mixed methods research approach to studying teacher education is needed in order to best answer the range of questions that are practically and theoretically important. Individual questions and problems call for different research approaches, which makes it important to look both within and outside the areas illuminated by a single approach to research:

> Given the complexity of teacher education and its connections to various aspects of teacher quality and student learning, no single methodological or theoretical approach will be able to provide all that is needed to understand how and why teacher education influences educational outcomes (Zeichner, 2005, p. 743).

Using a mixed methods research approach for studying problems within a teacher education programme may contribute to illuminating a wider range of questions that are practically and theoretically important than by using only a single method approach (Zeichner, 2005).

When using mixed methods, the researcher may use qualitative research methods for one stage of a study and quantitative methods for another stage of the study. A qualitative and a quantitative study are in this way conducted either sequentially (i.e. findings from one approach inform the other) or

concurrently (i.e. independent of each other) (Leech & Onwuegbuzie, 2009) to understand a phenomenon of interest. Moreover, different status or emphasis may be given to the two methods within a mixed methods study. According to Johnson, Onwuegbuzie and Turner (2007) there are three major research paradigms of mixed methods research; *qualitative dominant, quantitative dominant* and *equal status.* The three paradigms are illustrated in Figure 1:

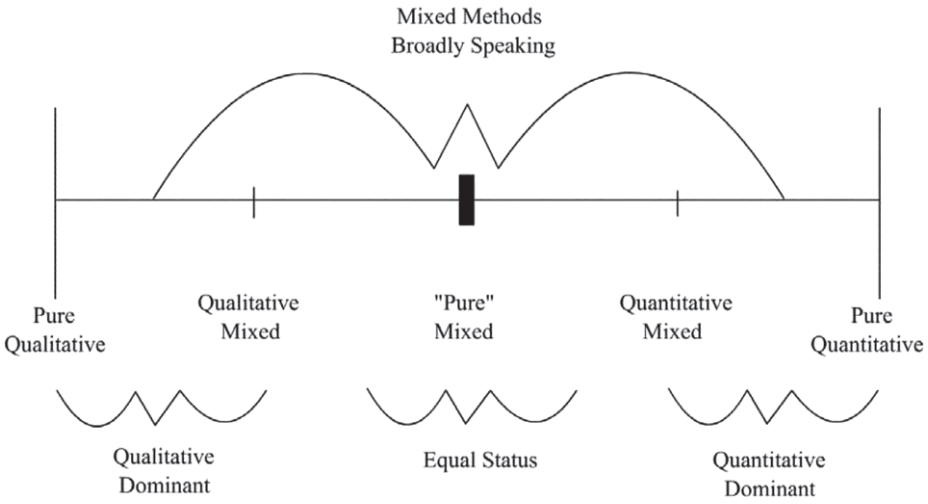

Figure 1 Graphic of the three major research paradigms of mixed methods research (Johnson, Onwuegbuzie & Turner, 2007, p. 124)

In the first paradigm, qualitative dominant mixed methods research, the researcher views the research process from a qualitative, constructivist-poststructuralist-critical point of view, while simultaneously recognizing the benefits of the addition of quantitative data and approaches. In quantitative dominant mixed methods research, on the other hand, the researcher sees the research process from a quantitative, post-positivist point of view, while simultaneously appreciating the added value of qualitative data and approaches (Johnson, Onwuegbuzie, & Turner, 2007). In the third paradigm the researcher gives equal status to each of the two methods by taking the logic and philosophy of mixed methods research as a starting point:

> The area in the center of the figure, moving outward in both directions (and excluding the area near the poles), is where mixed methods research,

> broadly speaking, falls, with the center representing the strongest or "pure" form (Johnson, Onwuegbuzie, & Turner, 2007, p. 123)

I have chosen a mixed methods design that combines two qualitative studies and one quantitative study. The details of this design will be discussed in the next subsection. As the two types of methods and data in my study are not given equal status, the study cannot be labelled as a "pure mixed study", but falls instead to the left towards "*qualitative dominant* mixed methods research" (Johnson, Onwuegbuzie, & Turner, 2007, p. 124). Johnson, Onwuegbuzie and Turner propose the following definition for *qualitative dominant* mixed methods research:

> Qualitative dominant mixed methods research is the type of mixed research in which one relies on a qualitative, constructivist-poststructuralist-critical view of the research process, while concurrently recognizing that the addition of quantitative data and approaches are likely to benefit most research projects (Johnson, Onwuegbuzie, & Turner, 2007, p. 124).

As such, this mixed methods research paradigm is particularly relevant for researchers with a qualitative background, who acknowledge that quantitative data and approaches can be incorporated in their otherwise qualitative research projects.

4.2 Multiphase design

I have chosen to use a multiphase design (Creswell & Plano Clark, 2011) for my study. A multiphase design involves collecting data in an iterative process whereby data collected in one phase contributes to the data collected in the next. This design is used to examine a topic by combining qualitative and quantitative studies sequentially, where findings from one phase inform the next. The purpose of the design is "to address a set of incremental research questions that all advance one programmatic research objective" (Creswell & Plano Clark, 2011, p. 100). Hence, the multiphase design allows for each individual study to address a specific set of research questions that evolves from what was learned in the previous studies in order to address the overall programme objective.

The following figure, influenced by Creswell and Plano Clark (2011), illustrates the multiphase design developed for my study:

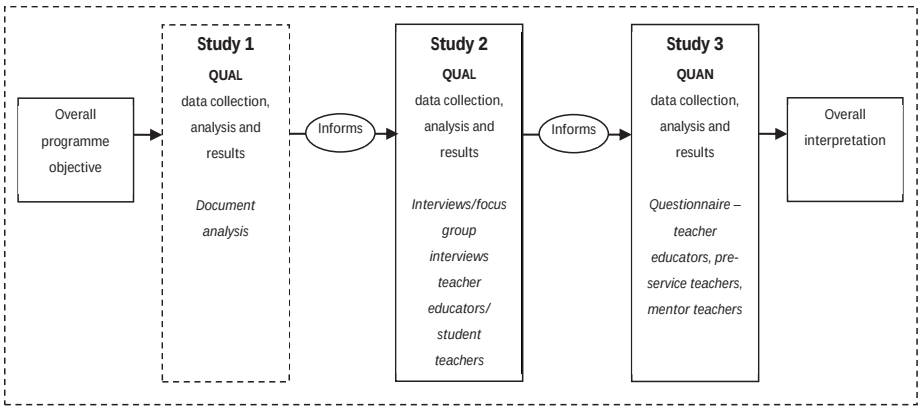

Figure 2 Multiphase design

As shown in Figure 2, the overall research topic is examined through a multiphase design combining two qualitative sub-studies and one quantitative sub-study. The three studies were sequentially aligned, and each study represents a phase with its own research questions and results that build on what was learned in the previous phases, while simultaneously contributing to meeting the overall programme objective.

The overall programme objective for my study is to contribute to increased knowledge about how professional digital competence is emphasized and integrated in initial teacher education programmes in Norway. As previously mentioned, the study has a qualitative dominant design (Creswell & Plano Clark, 2011; Johnson, Onwuegbuzie, & Turner, 2007) as the first two phases were based on qualitative approaches (document analysis and qualitative interviews), while the last phase was quantitative (questionnaire). Results from each of the three studies, hereafter referred to as phases to emphasize the sequential aspect, were documented and published in individual articles. Thus, the first two articles presented in this thesis are based on a qualitative approach, while the third article has a quantitative approach.

Data was collected sequentially; phase one in fall 2010, phase two in April 2012, and phase three between April and November 2014. This timeframe

provided an opportunity for influence between the three phases, as the results found in one phase directly informed the research questions, strategies and interview/questionnaire questions for the next phase. Data from each of the phases were analysed separately, before being mixed at the final stage of the study in order to be able to meet the overall programme objective.

In the first phase my aim was to get an overview of expectations and intentions towards use of technology in teacher education on a formal curriculum level (Goodlad, Klein, & Tye, 1979), and thus provide an understanding of the background for what is actualized in the classroom. This phase comprised qualitative document analysis of national and local curriculum documents for teacher education.

The purpose of phase two was to explore differences and similarities between teacher education institutions in terms of opportunities for appropriation of digital competence. Based on the results of the document analysis in phase one, two institutions were selected for a multiple-case study (Yin, Case Study Research. Design and Methods, 2009). This study comprised two components: 1) individual interviews with teacher educators and 2) focus group interviews with pre-service teachers in each of the two cases. In this way I tried to zoom in on two cases in order to capture both a student- and a teacher perspective on what Goodlad, Klein and Tye (1979) refer to as the *perceived*, *operational* and *experiential* curriculum levels.

In the two cases studied in the second phase some similarities and common challenges were found that we wanted to explore further in a larger sample. Accordingly, the aim of the third phase was once again to zoom out and get more of an overview of how professional digital competence was perceived and emphasized among teacher educators, pre-service teachers and mentor teachers in Norwegian teacher education programmes. Therefore, phase three was designed as a quantitative study, where questionnaires were developed and analysed, combining scores from teacher educators, pre-service teachers and mentor teachers.

The three different research questions addressed in the three phases all called for different strategies for both sampling, collection of data and analysis. In the following section the strategies chosen for the three studies will be

presented, and the influence and level of interaction between the three phases will be discussed further.

4.2.1 Phase 1: Qualitative content analysis

The research area in phase one was approached with the following research question: *Which knowledge areas of digital competence are addressed in national and local curriculum documents, and how?*

In order to answer this question qualitative content analysis of central and local curriculum documents for teacher education in Norway was conducted. At the time of study there were 20 higher education institutions in Norway providing four year initial teacher education programmes to qualify for teaching in the compulsory school years (1-7 and 5-10). Programme descriptions from 19 out of 20 higher institutions were collected during the first semester after the new teacher education reform was introduced in 2010. Due to language barriers one institution, Sámi University College, was excluded since their curriculum only existed in a Sami version at the time. In addition to the local curriculum documents, official curriculum documents (national curriculum regulations and national guidelines) were collected and analysed.

Krippendorff defines content analysis as a "research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use" (Krippendorff, 2004, p. 18). Content analysis can be used as either a qualitative or quantitative method (Hsieh & Shannon, 2005). In quantitative research content analysis is used for coding text into explicit categories that are described statistically, while qualitative content analysis focuses on the content or contextual meaning of the text. In our study we used qualitative content analysis as we wanted to explore meaning and interpret what Hsieh and Shannon refers to as "the content of text data through the systematic classification process of coding and identifying themes or patterns" (Hsieh & Shannon, 2005, p. 1278).

4.2.2 Phase 2: Multiple-case study

The second phase was also qualitative, and was guided by the following research question: *What opportunities for appropriation of digital competence does teacher education offer?*

Results from the first phase informed the selection of participants for the second phase. In the first phase we found that there were some variations among the different teacher education institutions in terms of technology integration on a formal curriculum level that we wanted to explore further. In order to find out whether these variations could also be observed on a perceived, operational and experiential curriculum level (Goodlad, Klein, & Tye, 1979) the next phase of the study was designed as a multiple-case study with two cases (Yin, 2009).

A case study is defined as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenology and context are not clearly evident" (Yin, 2009, p. 18) or "an in-depth description and analysis of a bounded system" (Merriam, 2009, p. 40). The purpose of a case study may be to either *explore* a phenomenon about which not much is known, to *describe* something in detail, or to *evaluate* or *explain* why something did or did not work (Ashley, 2012; Yin, 2009). The unit of analysis within a case study can be a single case or multiple cases. While a single case study is used to explore and describe the situation in one particular case, a multiple-case study can be used in order to strengthen the findings from the study. By selecting cases that are either replications of each other, deliberate and contrasting, or hypothesized variations, the results of the study can be discussed and compared across the cases (Yin, 2009). The two institutions that were selected for my study were the ones that distinguished themselves in relation to their emphasis on digital competence in the curriculum documents. The first institution was an institution with a relatively strong emphasis on digital competence on the *formal* curriculum level, while the second represented the opposite end of the scale, with little emphasis on digital competence in the curriculum documents. This led me to believe that there could be differences between these two institutions in terms of focus and emphasis on integration of professional digital competence. Hence, the selection was based on a

"contrasting cases" (Yin, 2006) or "maximum variation" (Patton, 1990) strategy, selecting cases that "were expected to lead to different findings for particular reasons" (Ashley, 2012, p. 103).

One of the advantages with case study research is that it is not limited to one source of data, but allows for multiple sources of data to be collected and analysed. The quality of a case study is increased by having multiple sources of evidence (Yin, 2006). In the two cases in my study data was collected through qualitative research interviews with teacher educators and focus group interviews with pre-service teachers, and in the following section I will elaborate on the methods and data collection strategies I used in the second phase of my study.

Data from teacher educators in each of the two institutions were collected through qualitative research interviews (Kvale & Brinkmann, 2009). In a qualitative research interview the researcher seeks to understand the world seen from the research participant's point of view, or what Mears refers to as the interviewee's *lived experience* (Mears, 2012). Thus, the main focus in a qualitative research interview is on the lived life of the interviewee, which Kvale and Brinkmann refers to as the interviewee's *Lebensweld* (Kvale & Brinkmann, 2009, p. 48, authors italics). The interview is an interpersonal situation where both individuals mutually influence each other, and in this way knowledge is constructed in the interaction between the interviewer and the interviewee (Kvale & Brinkmann, 2009).

Teacher educators were recruited through a three step process. First, in November 2011, written information (see Appendix 3) about the project, inviting teachers and pre-service teachers to take part in the study, was sent by mail and e-mail to the Dean of each of the institutions. The written information was followed up by phone-calls to the Deans a couple of weeks later. The Deans then forwarded the information to a selection of teachers in their institutions. Thirdly, I contacted these teachers directly and made arrangements with those who were willing to participate. Thus, the sampling strategy used for selecting participants can be described as combination of self-selection and a form of "snowball or chain sampling", which Patton describes as identifying "cases of interest from people who know people who know people who know what cases are information rich, that is, good

examples for study, good interview subjects (Patton, 1990, p. 182). All teacher educators who agreed to participate received written information about the study (see Appendix 4) and signed an informed consent form before the interview was conducted (see Appendix 6).

A total of nine teacher educators agreed to participate in the study. Four teacher educators were female and five were male. They taught a variety of subjects: Norwegian (2); mathematics (1); Pedagogy and Pupil-related Skills (4); Educational technology (1); and Physical Education (1). Table 3 provides an overview of individual interviews (all teacher educators have been given fictitious names in order to ensure anonymity and confidentiality):

Table 3 Overview of the individual interviews in terms of the institution, name, gender subject and duration

Institution	Name	Gender	Subject/Study programme	Duration
Institution 1	Ben	Male	Pedagogy and Pupil-related Skills	01:31:35
Institution 1	Karen	Female	Mathematics	00:32:16
Institution 1	Sarah	Female	Pedagogy and Pupil-related Skills	01:18:37
Institution 1	Chris	Male	Educational technology	00:41:07
Institution 2	Anna	Female	Pedagogy and Pupil-related Skills	00:31.16
Institution 2	Tom	Male	Norwegian	01:05:47
Institution 2	Peter	Male	Norwegian	00:51:16
Institution 2	Lisa	Female	Physical Education	00:53:27
Institution 2	David	Male	Pedagogy and Pupil-related Skills	01:08:02

Pre-service teachers were selected through a combination of self-selection and opportunistic (Patton, 1990) or emergent sampling. In the information letter sent to the Dean of each of the institutions (see Appendix 3), I informed that I wished to speak to both teacher-educators and pre-service teachers during my visit. However, unlike with the teacher educators, I had not selected any pre-service teachers for the focus groups interviews in advance. Therefore, in

order to get in touch with pre-service teachers and simultaneously gain some informal indications of how technology was used, I participated in lectures at both institutions. In April 2012, I attended two full days of lectures in each institution together with pre-service teachers in their first and second year of teacher training. In line with ethical standards for research (The National Committee for Research Ethics in the Social Sciences and the Humanities (NESH), 2016), all pre-service teachers who attended these lectures received oral and written information (see Appendix 5) about the purpose of my visit, and they were asked to indicate their willingness to participate in focus group interviews. Patton argues that not every decision can be made in advance when it comes to selecting who to observe and interview in a qualitative study:

> Fieldwork often involves on-the-spot decisions about sampling to take advantage of new opportunities during actual data collection. Unlike experimental designs, qualitative inquiry designs can include new sampling strategies to take advantage of unforeseen opportunities after fieldwork has begun. Being open to following wherever the data lead is a primary strength of qualitative strategies in research. This permits the sample to emerge during fieldwork (Patton, 1990, p. 179).

As such, an opportunistic or emergent sampling strategy involves taking advantage of "whatever unfolds as it unfolds" (Patton, 1990, p. 179). In the two cases in my study, the sample of pre-service teachers emerged during my visit to the institutions. This allowed me to follow up on what I experienced in the lectures that I attended, which gave me a solid foundation for my questions and analyses.

A total of 14 students volunteered to participate, and all students signed an informed consent form before the interview started (see Appendix 6). An overview of the focus group interviews is provided in Table 4:

Table 4 Overview of the focus group interviews in terms of institution, study programme/year and number of participants in each group

Institution	Name	Study programme/ year	Gender	Number of participants	Duration
Institution 1	Group 1	1-7/year 2	1 male 5 female	6	01:12:10
Institution 1	Group 2	5-10/year 1	1 male 1 female	2	00:35:25
Institution 2	Group 3	1-7/year 1	2 male 2 female	4	00:39:21
Institution 2	Group 4	5-10/	1 male 1 female	2	01:07:19
Total number of participants				**14**	

As seen in the table above (Table 4), the number of pre-service teachers in each focus-group, as well as the duration of the interviews varied for each group. This will be discussed in the section concerning focus-group interviews (section 4.2.2.2), as well as in relation to research quality (section 4.4)

4.2.2.1 Qualitative research interviews

A theme-based semi-structured interview guide (see Appendix 7) was developed and used during the interviews with teacher educators to ensure that the same information was obtained from all of them (Kvale & Brinkmann, 2009), while simultaneously being open for follow-up questions that might occur during the interview. The following themes were covered in the interview-guide: 1) Background information, 2) Understanding of digital tools/digital competence, 3) Views on their own digital competence, and 4) Use of technology in the teacher education programme. Within each of these themes, the interview guide listed some open-ended, flexible questions.

The interviews were conducted in April 2012 in the teacher educators' offices. All teacher educators were asked about their perception of what constitutes the notion of *digital competence* and what they believed a teacher in their subject needed to know in order to be digitally competent. They were also asked about how and how much they used technology in their own teaching and how they would rate their own level of digital competence. Since all interviews were conducted on the basis of the same semi-structured interview guide, the time spent on each interview was controlled by the interviewees. Some of them were very verbal and gave long answers to all questions, while others were less talkative. This resulted in a great variance in the length of the interviews; from 32 to 91 minutes.

4.2.2.2 Focus group interviews

Data from pre-service teachers were collected through focus-group interviews. Focus group interviews are useful for exploring ideas and allow good interpretive validity (Johnson & Turner, 2003). Moreover, they can obtain in-depth information about how the participants think about the issues discussed and allow study of how they react to each other. On the other hand, there are also weaknesses that need to be considered. First off, the size of the groups and the question of whether the groups should consist of participants who provide *diversity* or *homogeneity* must be considered (Gibbs, 2012). The possibility of the discussion being dominated by one or two students must also be taken into consideration. In focus group interviews, the researcher acts more as a facilitator of a group discussion, rather than a questioner (Silverman, 2011). Although the task of the facilitator of a group discussion is to present the issues in question and create an open atmosphere where the participants are comfortable with expressing their attitudes, students may get influenced by the more dominant participants in the group and may thus be less inclined to present their personal opinions (Kvale & Brinkmann, 2009; Johnson & Turner, 2003).

As shown in Table 4, there were two focus groups with two participants, one group with four participants and one group with six participants. Moreover, one of the groups had only female participants, while the rest of the groups had an even gender distribution. The variation in number of participants in each of the groups, as well as the differences in gender distribution, is a

weakness in the study as both these factors may influence the result of the interviews. These weaknesses will be discussed in relation to research quality (section 4.4).

As with the teacher interviews, the focus group interviews were semi-structured (Kvale & Brinkmann, 2009), focusing primarily on the same themes as in the interviews with teacher educators. Hence, an interview guide was developed for the focus group interviews (see Appendix 8), focusing on five main themes: 1) Pre-service teachers' understanding of the present situation in school; 2) Pre-service teachers perception and operationalisation of the concept "digital competence" and what it takes to be a digitally competent teacher; 3) Use of technology in teacher education/for teaching and learning 4) Perception of their own digital competence/use of technology for assignments, and 5) Use of technology during teaching practice. The interview guide also contained questions related to each of these themes. However, in line with recommendations for focus-group interviews suggested by Gibbs (2012), these questions were used primarily as suggestions or reminders for me during the group discussion. This was done in order to let the pre-service teachers speak more freely, and devote time and attention to new areas of interest that may come up during the interviews. Thus, my main role in the interview was to suggest themes for the discussion, and bring the discussion back on track when necessary to make sure all themes were covered. In this way, the pre-service teachers themselves were in control of the conversation, and therefore the time spent on each interview ranged from 35 minutes for the shortest to 72 minutes for the longest interview.

4.2.3 Phase 3: Survey study

Phase three was guided by the following research question: *How is professional digital competence integrated in initial teacher education?* This question is fairly similar to the overall research question of the study, but was in the third phase explored from a quantitative perspective. The question was operationalized through three sub-questions:

1. How do teacher educators perceive their own digital competence, and how is this related to workplace support and their pedagogical efficacy?

2. How do mentor teachers' perceive their own competence, what they emphasize for students, and how do they perceive the emphasis of digital competence in teacher education?
3. How do pre-service teachers perceive the emphasis on digital competence in teacher education?

In order to answer these questions three questionnaires (see Appendices 9-11) were developed in collaboration with "The Panel for the teacher education reform", who was at the time doing a survey study on the status and way forward for the teacher education reform. Thus, the survey questions developed in order to answer the research questions for this phase were part of three larger questionnaires. Each of the questionnaires consisted of approximately 30 groups of questions. Out of these, one group of questions, with approximately 10 questions to each group of respondents, focused on digital competence and use of technology, while the rest of the questionnaire contained questions about the participants' experiences with other aspects of the teacher education programmes.

Both the research questions guiding the study and the survey questions were developed on the basis of the results from the first and second phase of the study. The first research question of the third phase was addressed through a survey of teacher educators opinions, while the second and third question were answered through surveys addressed to pre-service teachers and mentor teachers.

The three questionnaire surveys were sent out digitally to pre-service teachers (response time frame: 23 April - 6 June, 2014), teacher educators (response time frame: 12 August – 4 November, 2014), and to participating partner schools and mentor teachers responsible for supervising pre-service teachers during their teaching practice (response time frame: 12 August – 4 November, 2014). The total national number of pre-service teachers in their fourth year, teacher educators and partner schools made up the population, and participation was based on self-selection.

Pre-service teachers who participated were either fourth year students, completing their final year, or students who had opted for a five-year MA and were taking the fourth year as a first year of a 2-year MA programme. The

total population of possible respondents was 1436 (see (The Panel for the teacher education reform, 2015)), and the number of participants was 654, a response rate of 45.5%. Students from all 17 higher education institutions took part, but the response rate from each institution varies from 17.6% to 88.5%. The actual number of students per institution varies from 6 to 89. The composition of the group of student respondents is comparative with the total population concerning gender, and is believed to be comparative on age as well. However, the distribution across age levels is not known for the total population at their fourth year due to the number of early leavers that may have changed the age profile of the group since they started in 2010. In the current study, slightly less than 70% of the students are below 26, while slightly more than 30% are above 26 years of age.

Teacher educators on campus who were the target group for this study should all be teachers of student teachers during spring 2014. A link to the questionnaire survey was sent to a contact person at each higher education institutions, whose task was to distribute the link to relevant participants. Based on reports from all but one institution, the total population was estimated to 810 teacher educators. 387 teacher educators responded, giving us a response rate of 47.8%. The response rate varies greatly from institution to institution with only 2.2% at the institution with the lowest rate and 93.8% at the institution with the highest.

Obtaining a population number for the number of mentor teachers per higher education institutions turned out to be a complicated task. Initial teacher education programmes initiate contracts with partner schools, and the principal of each of these schools is responsible for making sure that there are enough qualified mentor teachers for each group of pre-service teachers that has teaching practice at that school. Therefore, what we have secured, is the number of partner contracts per initial teacher education programme from all but two institutions. Based on this, the number of possible participating schools in this survey is estimated to be 554. The number of schools that actually took part is 288, a response rate of about 62%. The response rate per institution varies from 37.5% to 100%. More than 1000 teachers at participating schools answered about 1/3 of the questionnaire survey, but after about 1/3 of the questions had been answered, only those who had actually

been mentor teachers the past semester were asked to continue. About 340 teachers continued and completed the questionnaire.

4.3 Data analyses

In this section the different approaches used to analyse the data in each phase of the study are described. Miles and Huberman (Miles & Huberman, 1994) define analysis as a process "consisting of three concurrent flows of activity: data reduction, data display, and conclusion drawing/verification (Miles & Huberman, 1994, p. 10). Each of these activities will be attended to in this section.

Data analysis in mixed methods research is related to the type of design chosen for the study. In a multiphase design, which I have chosen for my study, analyses occur both within the qualitative (phase one and two) and quantitative (phase three) approaches, and between the two approaches (overall programme objective) (Creswell, 2009). This means that at least three types of data analyses are employed; qualitative data analysis, quantitative data analysis and analysis of mixed data (Ponce & Pagán-Maldonado, 2015). In order to increase the methodological transparency of my research I will here present how the analytical concepts have been developed, and show how these concepts have been used for analysing data in all the flows of activity in each of the phases of my study.

4.3.1 Qualitative data analysis and analytical processes

In the first phase of the study qualitative content analysis was used for analysing curriculum documents. Qualitative content analysis is defined as "a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns" (Hsieh & Shannon, 2005, p. 1278). The analysis was carried out following Zhang and Wildemuth's eight steps for conducting qualitative content analysis; 1) Prepare the data, 2) Define the unit of analysis, 3) Develop categories and a coding scheme, 4) Test your coding scheme on a sample of text, 5) Code all text, 6) Assess your coding consistency, 7) Draw conclusions from the coded data, and 8) Report your methods and findings (Zhang & Wildemuth, 2009, pp. 3-5).

After preparing the data, the unit of analysis was defined by closely reading the curriculum documents several times. During the first reading all mentions of *basic skills*, *digital tools*, *technology* and *ICT* were highlighted. This reading also provided an overview of the structural variations of the documents included. In the second reading, the highlighted sentences were extracted and systematized according to the categories *introduction*, *knowledge*, *skills*, *general competence* and *other*. The categories *knowledge*, *skills* and *general competence* were defined on the basis of the National Qualifications Framework and were used in the programme descriptions to specify learning outcome. The categories *introduction* and *other* were developed as organisational categories for content not related to learning outcome, and embraced for instance educational methods, structure and form of instruction. In the final step of the analysis, the excerpts were encoded according to the three knowledge areas discussed in article one; *technology proficiency*, *pedagogical compatibility* and *social awareness*. This type of coding was inspired by elaborative coding where the goal is to refine or corroborate theoretical constructs from one or more previous studies (Saldaña, 2013; Miles & Huberman, 1994). The results of the analyses and the conclusions drawn from these results are presented in Article I.

In the second phase of the study, interview data were collected through qualitative research interviews and focus group interviews with teacher educators and pre-service teachers. All the interviews were conducted in Norwegian. Both types of interviews were digitally recorded, and were transcribed in Hyper TRANSCRIBE and analysed in HyperRESEARCH. The analysis followed Saldaña's (2013) recommendations for coding and categorizing qualitative data. Saldaña describes the coding procedure as a cyclical process consisting of two cycles; First Cycle methods and Second Cycle methods (Saldaña, 2013). First Cycle methods are described as being relatively simple and direct methods that happen during the initial coding of data, such as elemental methods, procedural methods or exploratory methods, while Second Cycle coding methods are more challenging methods, such as focused coding, axial coding and theoretical coding (Saldaña, 2013, pp. 58-59).

As part of the First Cycle coding, the transcripts from each of the interviews were read closely several times. During the first reading, an overview of the

data was achieved and broad categories focusing on initial patterns in the interviews were identified (Miles & Huberman, 1994). In the second reading, specific words and paragraphs that captured specific themes from the interview guide were highlighted combining several of the elemental methods suggested by Saldaña, such as structural coding and initial coding (Saldaña, 2013).

After the First Cycle coding process the codes applied to the data were collected and categorized using focused coding (Saldaña, 2013). As a result, three main categories were identified: *self-perceived digital competence level*, *use of technology for educational purposes,* and *reflection on digital competence for teachers.* The category *self-perceived digital competence level* as an analytical concept refers to teacher educators' and pre-service teachers' reflections on their own digital competence and how they believe their competence compares to the competence of their fellow students and colleagues. The second category, *use of technology for educational purposes*, refers to use of technology for teaching and learning. This includes how educational technology is taught by teacher educators and used by pre-service teachers with the intention to learn how to use it in a classroom environment. *Reflection on digital competence for teachers* refers to how teacher educators and pre-service teachers reflect on what kind of competence teachers need in order to be digitally competent. As part of the Second Cycle, each interview was then re-coded in light of these categories, and passages from the interviews that were relevant for these categories were translated from Norwegian to English. In the next step of the analysis data from each of the cases was assembled as a set and a descriptive case report was written for each case. The case reports are included in the findings section of article two.

As a final step of the analysis, a cross-case analysis was conducted (Saldaña, 2013; Miles & Huberman, 1994). In order to facilitate this analysis, an analytic approach was developed on the basis of Wertsch's (1998) understanding of learning as a process of *mastery* and *appropriation*. As defined in chapter 3, mastery refers to knowing *how to* use an artefact, while appropriation refers to "the process of taking something that belongs to others and make it one's own" (Wertsch, 1998, p. 53).

4.3.2 Quantitative data analysis

For the third phase of the study, three sets of quantitative data were collected and analysed. Three questionnaire surveys were sent out digitally to pre-service teachers, teacher educators and mentor teachers. For each of these sets descriptive analyses, as well as explanatory analyses were carried out in IBM SPSS Statistics for Windows.

As mentioned earlier, the response rate per higher education institution varied for each of the three respondent groups (pre-service teachers: 17.6% to 88.5%, teacher educators: from 2.2% to 93.8%, mentor teachers: from 37.5% to 100%). In an ideal study, the response rate per institution would have been higher, allowing for multilevel analyses and comparisons across institutions. However, previous research such as reported by Tømte, Kårstein and Olsen (2013) has found that development of digital competence was, to a great extent, dependent on individual teacher educators' efforts. We stated out by investigating frequency distributions within HEIs for items included in the study, and did not identify any patterns that could indicate that there were systematic differences in perceptions among respondents according to which HEI they were affiliated with. Our conclusion was therefore to analyse at the individual level for all respondent groups.

In research on integration of technology in education, the relations between teachers' use of technology and barriers to integration of technology have been studied extensively (Knezek & Christensen, 2008; Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012; Mumtaz, 2000; Christensen & Knezek, 2008; Morales, 2006). In our study we wanted to explore the relations between teacher educators' self-perceived digital competence, workplace support and pedagogical efficacy. In order to do this, three scales were developed: "teacher educators' digital competence" (one sum score variable), "workplace support" (two sum score variables) and "Teacher educators' pedagogical efficacy" (one sum score variable). Teacher educators' digital competence was measured by a six-item sum score variable (Cronbach's alpha= .87). The workplace support variables included were 1) "Positive management" (five items), (Cronbach's alpha= .93), and 2) "Management's development support" (two items), (Cronbach's alpha= .80). Teacher educators pedagogical efficacy was measured by a nine-item sum

score variable (Cronbach's alpha= .91). This item was based on the Bandura efficacy scale (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998) and is as such a fairly common measure of teacher efficacy.

Further, we wanted to explore how mentor teachers perceived their own digital competence and what they emphasized for students, as well as how mentor teachers and pre-service teachers perceived the emphasis on digital competence in teacher education. These questions were explored through single items.

The descriptive analyses included calculating frequencies, mean values and standard deviation, while the explanatory analyses included linear regression analyses and Pearson's r correlation coefficients. The purpose of these analyses was to explore the relations between teacher educators' self-perceived digital competence, workplace support and pedagogical efficacy, as well as how mentor teachers perceived their own digital competence and how mentor teachers and pre-service teachers perceived the emphasis on digital competence in teacher education.

4.4 Research quality

One of the most important challenges facing research is to make evident that what the researchers say is not random or false. No matter how different the objects of investigation and the goals of the research, there are certain challenges shared by all researchers, namely the challenges of enhancing reliability, validity and generalisability. How was the data collected, how were they analysed and how did the researcher reach the conclusions? All these questions have to do with reliability and validity of the results, and are crucial issues to consider in order to securing the quality of a study.

Within a mixed methods study, there are several recommendations as to whether to use the terms validity, reliability and generalisability, or to create a new language for mixed methodologies. The recommendations are not unambiguous. While some researchers argue that the decision to use either bilingual or common terminology must be made separately for each of the major stages of the mixed methods research design since the terminology is so varied (Teddlie & Tashakkori, 2003), others again maintain that the traditional

terms originating from the quantitative tradition are so well incorporated in research terminology that little concern should be devoted to this discussion (Miles & Huberman, 1994; Creswell & Plano Clark, 2011). In this thesis I have chosen to follow the latter when I use the terms validity, reliability and generalisability. In the following sections I will discuss these terms further and provide an account of how they are attended to in my study.

4.4.1 Reliability

The definitions of reliability and validity reveal two directions. Firstly, with regards to reliability, whether the results are replicable and secondly, with regards to validity, whether the means of measurement are precise and really measuring what they are intended to measure. Kirk and Miller (1986) define reliability as "the degree to which the finding is independent of accidental circumstances of the research" (Kirk & Miller, 1986, p. 20). Others, for instance Hammersley focus more the role of the researcher when he defines reliability as "the degree of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions" (Hammersley, 1992, p. 67).

The question of reliability should be addressed in relation to all three phases of my study, as well as to the final mixing. The studies in the first two phases are qualitative, while the study in third phase is quantitative. Creswell and Plano-Clark (Creswell & Plano Clark, 2011) argue that reliability has limited meaning in qualitative research. Nevertheless, one of the reliability questions to consider in this context is whether the study would yield the same or similar results if it was conducted in the same way by a different researcher or at different time (Kirk & Miller, 1986). Following Silverman's (2011) recommendations, two different methods have been employed to maintain a high reliability in the qualitative phases of the study; 1) Intercoder reliability (whether a different researcher would code the same data the same way), and 2) Low inference descriptors (record observations as concrete as possible).

Intercoder reliability, also referred to as intercoder *check*s or intercoder *agreement* (Creswell, 2009; Creswell, 2013), were used in all phases of the study. In the first phase, I developed a list of coding categories from the theories on digital competence for teachers (i.e. Zhao, Pugh, Sheldon, &

Byers, 2002; Koehler & Mishra, 2009; Krumsvik, 2008). These categories were discussed with my supervisor before the initial coding started, and during the coding and analysis of data we discussed excerpts from the curriculum documents. When analysing the interviews, excerpts from the interviews were discussed in detail, and coding categories were refined several times before ending up with the final four coding categories presented above (self-perceived digital competence level, use of technology for educational purposes, and reflection on digital competence for teachers). Further, low inference descriptors were used in the first and second phase of the study in order to strengthen reliability. Both the qualitative research interviews and the focus group interviews were fully recorded and carefully transcribed. When reporting from the curriculum documents (Article I) and the interviews (Article II) long extracts were included in the articles in order for the reader to make their own interpretations and in this way avoid potential inferences caused by my interpretation.

Another issue of relevance for reliability in the second phase of the study is the selection method and whether other participants may have provided other input and led to other results. As described above, I did not employ a stringent selection method (e.g. every fifth student on a roster), but used an emergent approach, which meant that the participants were included while I was at the institution and observing instruction. Teacher educators were selected through a combination of self-selection and "snowball or chain-sampling" (Patton, 1990), while selection of pre-service teachers for the focus group interviews were based on self-selection and emergent sampling (Patton, 1990). This could have led to skewness in sampling. One of the problems with self-selection is the risk of self-selection bias, which means that there might be a risk that the decision to participate in the study could reflect some inherent bias in the characteristics of the participants (Mujere, 2016), for instance only teacher educators who are favourable to technology use – or the opposite. In a study about integration of technology in education it is likely that people who volunteer to participate are either very in favour of or very against use of technology, which could mean their views on the issues discussed do not represent the full range of views. In the case of teacher educators this must be taken into consideration when studying the results.

Although this could also be the case for the pre-service teachers who participated in this study I believe that the use of focus-group interviews may have contributed to turning this potential bias this into something positive by bringing together participants with different perceptions of the phenomenon and by this increasing the level of reflection and discussion between participating students. As shown in Table 4, there were two focus groups with two participants, one group with four participants and one group with six participants. Moreover, one of the groups had only female participants, while the rest of the groups had an even gender distribution. The variation in number of participants in each of the focus groups, as well as the differences in gender distribution, could be a weakness in the study as both these factors may influence the result of the interviews. The analyses show, however, that there is reason to believe that pre-service teachers who participated in the study were fairly comparative with the total population concerning gender and age. The four focus-groups consisted of 14 pre-service teachers all together, where nine were female (64.3%) and five were male (35.7%). The gender distribution among the cohort of pre-service teachers who started initial teacher education (GLU 1-7 and 5-10) in 2010 was 80% female and 20% male for GLU 1-7 and 64% female and 36% male for GLU 5-10 (The Panel for the teacher education reform, 2011). Thus, there is reason to assume that the results would not have been very different with different groups of students.

The variance in length of the interviews, ranging from 35 to 72 minutes for the focus group interviews and from 32 to 91 minutes for the qualitative research interviews, is also an issue of relevance for reliability. While all qualitative research interviews with teacher educators were conducted on the basis of the same semi-structured interview guide, the questions in the interview guide served more as suggestions or reminders for me during the focus group interviews. Nevertheless, each of the themes in the interview guides was covered in all the interviews, which gave all participants the opportunity to discuss the same issues. Some of them were very verbal and gave long answers to all questions, while others were less talkative. In this way, the time spent on each interview was controlled by the interviewees.

In all phases of the study *peer debriefing* was also used. Creswell and Miller define peer debriefing as:

> the review of the data and research process by someone who is familiar with the research or the phenomenon being explored. A peer reviewer provides support, plays devil's advocate, challenges the researchers' assumptions, pushes the researchers to the next step methodologically, and asks hard questions about methods and interpretations (Creswell & Miller, 2000, p. 129)

In my study my supervisor served the role as a peer reviewer throughout the entire study, providing feedback to all the different stages of the research process and in this way contributing to strengthening the reliability of the study.

4.4.2 Validity

Validity determines whether the research truly measures what it was intended to measure or how truthful the results are. The process of validation is not something that belongs to a separate stage of a study; it is an issue that infiltrates the entire research process (Kvale & Brinkmann, 2009; Yin, 2014). Four types of validity tests are commonly used to establish the quality throughout the research process; 1) construct validity, 2) internal validity, 3) reliability and 4) external validity (Yin, 2014).

The first involves identifying whether the operational measures cover the concepts being studied (construct validity). The second examines the relationship between variables in the study, and seeks to establish whether causal relationships can be found (internal validity). The third test is related to the operations of the study and whether these can be repeated by a different person or at a different time and return the same results (reliability). The final test examines if, and to what extent, findings can be generalised to other groups, places, and times (external validity). This latter form of validity is also referred to as the generalisability of findings; "the degree to which the results can be generalized to a wider population, cases, settings, times or situations, i.e. to the transferability of the findings" (Cohen, Manion, & Morrison, 2011, p. 186).

The first type of validity, construct validity, seeks to establish whether the correct operational measures have been used for studying the concepts under study. In the first phase of the study national and local curriculum documents

were analysed by means of qualitative content analysis (Krippendorff, 1980; Hsieh & Shannon, 2005). Teachers' digital competence was in this study operationalised through three theoretically interrelated concepts; technology proficiency, pedagogical compatibility and social awareness. These concepts were developed on the basis of three theoretical perspectives on development of teachers' digital competence. As such, the identification and use of operational measures that matched the concepts (Yin, 2014), in this case identified in previously published studies from other researchers within the field, contributed to strengthen the construct validity.

The second phase of the study is a multiple-case study with two cases. According to Yin, the question of construct validity is found to be particularly challenging in relation to case study research due to the fact that researchers may approach the field of study with subjective judgements that confirms the researcher's preconceived notions or bias (Yin, 2014; Flyvbjerg, 2006). Therefore, in line with Yin's recommendations for strengthening construct validity in case studies, multiple sources of evidence were collected. In each of the cases data was drawn from two sources: qualitative interviews with teacher educators and focus-group interviews with pre-service teachers. The main concepts addressed in the article, *mastery* and *appropriation*, and digital *competence*, were supported by theory by respectively Wertsch (1998) and Ferrari (2012). The theoretical foundations for the concepts, along with the different sources of evidence were used to develop converging lines of inquiry (Yin, 2014). In this way, the views of the two groups of participants on digital competence and use of technology in their institutions were used to measure the theoretical understanding of the concepts, which in turn contributed to strengthening construct validity in the study.

These concepts are fairly abstract concepts, and difficult to observe *per se*. In this study (Article II), digital competence was defined as "knowledge, skills and attitudes required in order to use technology critically and reflectively in the process of building new knowledge" (Instefjord, 2014, p. 313). Mastery was defined as *knowing how to use an artefact*, while appropriation refers to "the process of taking something that belongs to others and make it one's own" (Wertsch, 1998, p. 53. In order to be able to use technology effectively as a teacher, appropriation of an artefact is far more than knowing how to use technology in isolation or in personal situations (Haugerud, 2011).

An example of an utterance that was determined to reflect *mastery without appropriation* is:

> It feels like I sit by that machine nearly all day. And that leads to, when I finish work and go home at night, I do not really want to turn on my computer in the evening. I simply think I use it so much, but I use it less in teaching, but maybe, yes, no, I will not say I use it too much, but too badly I'd rather say. […] You know, I think that when our students get out in the classroom during practical training they will soon understand that they cannot follow our example and give only one way lessons like we do here (Case 2: Tom) (Instefjord, 2014, p. 323).

This utterance shows that the teacher educator masters the technical aspects of the software itself, but he is not happy with neither his own use of it in the classroom, nor does he see any potential educational benefits.

An utterance that was determined to reflect *appropriation* is:

> We use Excel, in several different areas, and then students learn to use Excel while they also see what this can be used for in school, and we also discuss what is good and what is not good about using spreadsheets. And we use GeoGebra, a programme that is very good for solving equations and working with functions, and for showing things in geometry. And then we have a discussion about why it is ok to use it in teaching and which benefits it provides pupils (Case1: Karen) (Instefjord, 2014, p. 319).

This utterance shows that the teacher educator has appropriated the necessary artefacts both on a personal and didactic level. She demonstrates a high level of pedagogical reflection concerning uses of technology for educational purposes and makes it clear that she only uses technology when she finds this to be the tool best suited in order to accomplish the desired learning outcome.

The main concept discussed in the third phase of the study (Article III) is professional digital competence. The question of construct validity should here be considered in relation to the six items that make up the sum score variable "teacher educators' digital competence". One of these items ("I have good competence in the use of interactive whiteboards (i.e. SmartBoard)") is directly related to teacher educators *technical* skills, or what we in the first article (Article I) refers to as *technological proficiency,* while the remaining

five items are related to the pedagogical use of technology, *pedagogical compatibility* (Instefjord & Munthe, 2016). This question may make it appear as if we consider being able to use interactive whiteboards the most important technical aspect of teachers' professional digital competence, which is not our intention. The choice to ask teacher educators about their competence in use of interactive whiteboards was based on the results from the second phase of the study where both teacher educators and pre-service teacher expressed their concerns about lack of knowledge and skills in using interactive whiteboards and the prevalence of such hardware in teacher education institutions. The technical item, together with the remaining five items in the sum score variable corresponds to a great extent to the understanding of professional digital competence found in the framework for teachers' professional digital competence (Kelentrić, Helland, & Arstorp, 2017) (e.g. related to ethics, assessment, understand what pupils' digital skills entail etc). As such, there is reason to believe that the sum score "teacher educators' digital competence" measures what it is intended to measure.

In the overall interpretation in the final mixing, construct validity should be considered in relation to the use of different concepts to describe teachers' digital competence in the three phases of the study (Articles I-III). In the first article teachers' digital competence is understood as comprising three knowledge areas; *technology proficiency*, *pedagogical compatibility* and *social awareness* (Instefjord & Munthe, 2016). In the second article digital competence is defined as "knowledge, skills and attitudes required in order to use technology critically and reflectively in the process of building new knowledge" (Instefjord, 2014, p. 314). In the third article we lean on Lund, Furberg, Bakken and Engelien's (2014) definition of professional digital competence when we argue that:

> Being able to integrate and use technology for educational purposes involves having a set of generic skills suitable for all situations, both personal and professional, as well as specific teaching-profession skills. This is what is referred to as *professional digital competence for teachers* (Instefjord & Munthe, 2017, p. 37).

In the final interpretation, I have built my understanding of professional digital on the "Framework for teachers' professional digital competence"

(Kelentrić, Helland, & Arstorp, 2017). Hence, as the quotes above illustrate, my understanding of what it means to be a digitally competent teacher has developed during the time it has taken to finish my research. In research, such a development can be seen as both a limitation and an advantage; a change in the understanding of a phenomenon can reduce the chance of comparing the results from each phase of the project, but it can also contribute to building a stronger foundation for the final conclusions.

Internal validity seeks to establish "a causal relationships, whereby certain conditions are believed to lead to other conditions, as distinguished from spurious relationships" (Yin, 2014, p. 46). Potential treats to internal validity arise primarily during the analysis of a study, and are caused by for instance "experimental procedures, treatments, or experiences of the participants that threaten the researcher's ability to draw correct inferences from the data about the population in an experiment" (Creswell, 2009, p. 162).

For case study research, Yin notes that the concern of internal validity extends to the broader problem of making inferences:

> Basically, a case study involves an inference every time an event cannot be directly observed. An investigator will 'infer' that a particular event resulted from some earlier occurrence based on interview and documentary evidence collected a part of the case study. Is the inference correct? Have all the rival explanations and possibilities been considered? Is the evidence convergent? (Yin, 2014, p. 47)

Accordingly, to strengthen the internal validity in the multiple-case study, the following tactics, proposed by Yin, were adopted the in the analytic phase: *pattern matching, data source triangulation* and *awareness of themes replicated across cases* (Yin, 2014).

The third phase of the study was carried out as a survey study with three questionnaires. In this phase of the study, internal validity between the variables was tested using Cronbach's alpha to provide an indication of the average correlation among the items that make up the scales.

In this regard, using a mixed method research approach may contribute to enhancing the validity and reliability of research findings:

> Linking qualitative and quantitative methods in a study can enhance the validity and reliability of findings as well as allow for the exploration of contradictions found between the quantitative and qualitative results (Hesse-Biber, 2010, p. 465).

The use of a sequential, multiphase design, linking qualitative and quantitative methods in different phases of the study, may contribute to enhancing all four types of validity. In the multiphase design developed for this study, data was collected sequentially, and the results from one phase directly informed and influenced the development of instruments for the next phase. At the data-collection stage of each phase, I have been able to evaluate the validity and reliability of the finding by asking similar questions in both qualitative and quantitative studies. This may contribute to ascertaining that similar questions yield similar responses and that the responses seem to cover the same underlying issues (Hesse-Biber, 2010). In this way, each phase of the study has contributed to the validation of the results of the previous phases.

The overall results of the study adds to the results of previous studies (e.g. Gill & Dalgarno, 2017; González-Sanmamed, Sangrà, & Muñoz-Carrilc, 2017; Tømte, Kårstein, & Olsen, 2013; Gudmundsdottir, Loftsgarden, & Ottestad, 2014).

4.4.3 Generalisability

External validity or *generalisability* establishes the extent to which a study's finding can be generalised. Threats to external validity arise when incorrect conclusions are drawn from the sample, to other persons, contexts or situations (former of future) beyond the groups being studied (Creswell, 2009). In the document analysis in the first phase of the study, I analysed curriculum documents from all teacher education institutions that offered initial teacher education at the time. Thus, the inferences drawn from my analyses can be generalised to the formal curriculum level of all Norwegian teacher education institutions. However, the curriculum documents were all collected in 2010 and there is reason to believe that teacher education institutions have developed their curriculum documents since then. Therefore,

the results of this phase of the study cannot be generalised to present or future teacher education programmes.

The relatively small number of participants in each of the two cases in the second phase of the study also poses a potential threat to external validity. It is difficult to determine whether similar results could be identified across a larger group of teacher educators and pre-service teachers, or in different institutions. However, the goal of a case study is not to generalize across populations but to contribute to expand on or generalise theories by studying individual, group or organizational phenomena in the context of which they occur (Yin, 2009). This is what Yin refers to as *analytic generalisation* (Yin, 2009, p. 15). Thus, although the findings are difficult to generalise to the overall population of pre-service teachers and teacher educators due to the small number of participants, they provide knowledge about a particular context (i.e. two groups of pre-service teachers and teacher educators). This context specific knowledge is provided through rich descriptions of the two cases, which in turn adds to existing theories on integration and use of technology in teacher education.

A second kind of generalization within case study research is *naturalistic generalisation* (Melrose, 2009; Stake, 1995). The objective of naturalistic generalisation is not for researchers to present conclusions that can be transferred to a large population, but to invite readers to reflect on how ideas from the depictions presented may be applicable to their own situations (Melrose, 2009). In the current study, teachers, teacher educators and pre-service teachers are invited to translate the cases into their own day-to-day experiences with integration of technology in their classroom.

In the third phase of the study the total national number of fourth year pre-service teachers, teacher educators, and partner schools made up the population, and participation was based on self-selection. The sample of pre-service teachers' is comparative with the total population concerning gender, and is also believed to be comparative on age. However, the response rate for all three groups of respondents (preservice teachers: 45.5%.; teacher educators: 47.8%; mentor teachers: see Article III) was low, something which threatens the external validity of the results.

4.5 Research ethics

The ethical aspects were attended to in all phases of the study, and the study was conducted in line with the ethical guidelines for research, prepared by the National Committee for Research Ethics in the Social Sciences and the Humanities (NESH) (2016). Before the data collection started, the Norwegian Centre for Research Data (NSD), who serves as Data Protection Official for Research for Norwegian universities and university colleges, were notified about the study. They assessed the research design, information letters and interview guides and gave their approval (see Appendix 1).

In phase one local programme descriptions were collected by the panel appointed to follow the implementation of the teacher education reform (The Panel for the teacher education reform) while national curriculum documents (national curriculum regulations and national guidelines) were downloaded from the Ministry of Education and Research's website. The documents were all public documents, and the names of the institutions were therefore used in the first six stages of the qualitative content analysis. In the final two stages (7) Draw conclusions from the coded data, and 8) Report your methods and findings (Zhang & Wildemuth, 2009, pp. 3-5)) I chose to anonymize the institutions and replace their names with numbers (Institution 1, 2, 3 etc). This was done for three reasons. First, the aim of the first phase was to provide an overview of how digital competence was addressed in national and local curriculum documents. Thus, our aim was not to try to find "the best" or "the worst" institutions in terms of their focus on professional digital competence in terms of technology proficiency, pedagogical compatibility and social awareness, but rather to paint a picture of the situation as a whole. For this reason we chose not to identify the institutions. Second, the results of the study were written for an international audience, with possibly little knowledge about Norway, and therefore we concluded that the names of the institutions would be of only minor interest for this audience. Third, knowing that local study plans and curriculum change, and that there is a risk that by identifying an institution, future readers might believe that the results we obtained were still valid, the ethical implications of this kind of misunderstanding was something we also wanted to address. In this way we maintained the institutions' confidentiality and avoided any conflicts of interest in terms of social responsibility.

In phase two, two institutions were selected for a multiple-case study (Yin, Case Study Research. Design and Methods, 2009). In order to make sure that the participants of the study could not be identified, neither directly nor indirectly, as part of a community recognisable in publications, the names of these institutions, as well as names of their geographic locations were anonymized. To further ensure anonymity and maintain the confidentiality, privacy and personal integrity of the people who took part in the study, all teacher educators were given fictitious names, while pre-service teachers were primarily referred to as students.

The teacher educators who participated in the study had first been selected by their deans, and were then contacted by me. Seen from an ethical perspective, the role of the Deans in this connection may be problematic, as they may have held the position of gatekeepers (Ryen, 2011). Saunders (2006) defines a gatekeeper as "the person within a group or community who makes the final decision as to whether to allow the researcher access to undertake the research" (p. 127). Thus, unless the gatekeeper sees the value of the research it is unlikely that access is granted. Given that the gatekeeper is the person granting the researcher access to a group of people who are chosen to participate (Johnson & Christensen, 2013), the gatekeeper may also control the research by making sure that the participants chosen to take part in the study will speak in favour of the organization. On the other hand, doing research in a school requires permission from the management of the institution, which means that going through these gatekeepers in order to gain access, is necessary according to the guidelines for ethics suggested by the The National Committee for Research Ethics in the Social Sciences and the Humanities (NESH).

Before the data collection in phase two started, all participants received written and oral information about the study (see appendix 4 and 5). In this information it was emphasized that participation in the study was voluntary, that all collected data would be treated anonymously and confidentially, and that they could withdraw their consent any time during the study. The participants who chose to take part in the study were given informed consent forms (Kvale & Brinkmann, 2009) that they were to sign and return to the researcher (see appendix 6). In this way a documented, *freely given* and *informed consent* (The National Committee for Research Ethics in the Social

Sciences and the Humanities (NESH), 2016) was obtained from all participants.

In the third phase three questionnaires were sent to teacher educators, mentor teachers and pre-service teachers through e-mail. In the questionnaires it was informed that all collected data would be treated anonymously and confidentially, and it was accentuated that in case of a low number of respondents from each institution, some analyses would only be carried out on a large group-level across institutions in order to maintain participants' anonymity. Further, they were informed that they could withdraw their consent any time during the study.

5 Summary and discussion

As presented in the previous chapter, the overall research topic is examined through a multiphase design combining two qualitative and one quantitative sub-study. The results of these sub-studies have been presented in three individual articles, and in this chapter the main results from each of the articles are presented and discussed. First I will give a brief summary of the three articles and discuss the findings of each article. Next, I discuss the overall contribution of my thesis, before I end the chapter with some concluding remarks and recommendations for further research.

5.1 Summary of the articles

The overall aim of the thesis is to gain knowledge about use and integration of technology in initial teacher education programmes in Norway, and how development of pre-service teachers' professional digital competence is attended to within this context. The main research question for the thesis is: *How do initial teacher education programmes in Norway attend to integration of technology and development of pre-service teachers' professional digital competence?*

This question has been explored through three sub-studies discussed in the three articles below. The articles move from a wide perspective in the first article, exploring how digital competence is attended to in the teacher education curricula, to taking a narrower perspective in the second article, examining opportunities for appropriation of digital competence in two teacher education institutions, before ending the study by once again widening the perspective by performing a large survey among teacher educators, pre-service teachers and mentor teachers in all teacher education institutions in Norway.

5.1.1 Article I

Instefjord, E., & Munthe, E. (2016). Preparing pre-service teachers to integrate technology: an analysis of the emphasis on digital competence in teacher education curricula. *European Journal of Teacher Education, 39*(1), pp. 77-93.

Research question: *Which knowledge areas of digital competence are addressed in national and local curriculum documents, and how?*

In the first article focus was directed towards integration of digital competence in curriculum documents for teacher education in Norway. National guidelines and curriculum regulations, along with programme descriptions from 19 teacher education institutions were analysed using an analytical model inspired by the work of Zhao, Pugh, Sheldon and Byers (2002), as well as Krumsvik (2008), and Mishra and Koehler (2006). In this model (Figure 3), teachers' digital competence was understood as comprising three knowledge areas: technology proficiency, pedagogical compatibility and social awareness:

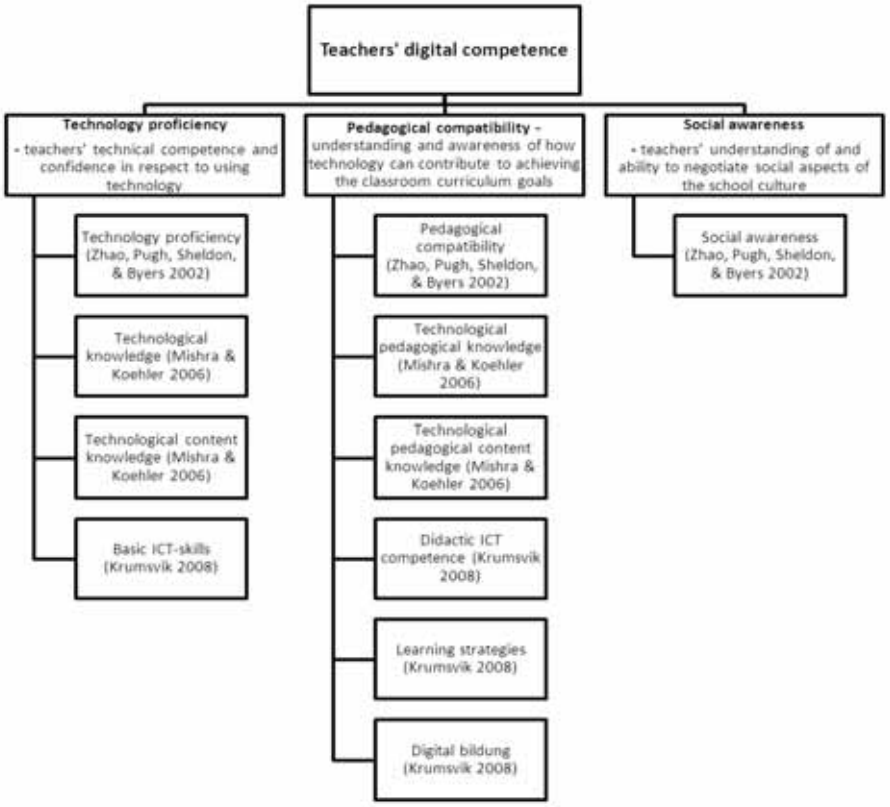

Figure 3 Teachers' digital competence model (Instefjord & Munthe, 2016)

Technology proficiency is understood as teachers' technical competence and confidence in respect to using technology. This understanding is in line with Ferraris' (Ferrari, 2012) definition of digital competence, but is expanded to also include the teacher perspective. For pre-service teachers technology proficiency constitutes a key competence for their own learning during teacher training as well as an essential component of the professional teacher competence that they are to acquire through teacher training. The second area of digital competence, pedagogical compatibility, is conceptualized as teachers' understanding and awareness of how technology can contribute to achieving the classroom curriculum goals. Seen from a teacher education perspective this underlines the necessity of providing pre-service teachers with both technical competence and awareness in order move away from the

technical aspects of technology towards a better understanding of technology as an educational resource. The third area of knowledge associated with teachers' digital competence is social awareness, focusing on the impact of teachers' understanding of and ability to negotiate social aspects of the school culture. This area of competence embraces an understanding of the social dynamics of the school culture and the potential problems that can occur in relation to the use of technology. A social aware teacher will, according to Zhao et. al. (2002), be better qualified to foresee potential difficulties and is therefore more likely to attain successful technology integration.

The model was used as an analytic tool for a qualitative content analysis of curriculum documents and programme descriptions mentioned above. The results of the analyses indicated that none of the three knowledge areas of digital competence had a prominent position in the curriculum documents. There were few binding learning outcomes for the integration of technology, suggesting that digital competence was still not regarded as an important component of teachers' professional competence.

The results also revealed that there were only minor differences between the teacher education institutions in terms of technology integration on the curriculum level. This can be explained by the fact that the teacher education institutions have developed their local curriculum documents on the basis of the national curriculum documents. Therefore, some of the formulations presented in the article are found in the general provisions of most of the 19 programme descriptions analysed. However, due to the fact that the national curriculum documents are only presented as guidelines, some institutions have chosen not to include all details from the national curriculum documents, while others have added more thorough descriptions of the desired learning outcome for pre-service teachers with regards to their professional digital competence. In this respect, programme descriptions from two of the teacher education institutions distinguished themselves clearly from the others, representing opposite extremes with respect to technology integration; the first containing no examples of technology integration, not even the formulations found in the national curriculum documents, and the second, representing the opposite end of the scale with multiple examples. In the article we argued that this may indicate that there still are substantial differences between institutions in terms of technology integration and how

institutions influence pre-service teachers to use technology. These institutional variations may contribute to providing pre-service teachers with differing levels of knowledge of the use of technology in education, and thus enhance digital divides among graduates. Ultimately, this may in turn contribute to maintaining low levels of the educational use of ICT in schools.

The analytic model developed in the article constitutes the theoretical contribution of the article. By contributing to operationalizing and clarifying the content of the concept "teachers' digital competence", the article aims to contribute to increasing teacher educators' awareness of which areas of knowledge they integrate into their curricula, what the goal of this knowledge is, and which strategies are best suited to help pre-service teachers acquire this knowledge.

As mentioned above, the results revealed that there were differences between teacher education institutions in terms of technology integration on the formal curriculum level, which suggested that differences could also be found on the perceived, operational and experiential curriculum level. Consequently, the results from the first phase contributed to the choice of cases for the case study in phase two (presented in Article II), as well as helping narrowing the scope, aim and research questions for the final, quantitative phase of the study (presented in Article III).

5.1.2 Article II

Instefjord, E. (2014). Appropriation of Digital Competence in Teacher Education. *Nordic Journal of Digital Literacy, 9*(4), pp. 313–329.

Research question: *What opportunities for appropriation of digital competence does teacher education offer?*

As the title suggest, the aim of the second article was to explore opportunities for appropriation of digital competence in teacher education. The article reported from a case study of two teacher education institutions, and the focus was directed towards teacher educators' and pre-service teachers' perceptions and descriptions of digital competence, and how technology was being used and appropriated by teacher educators and pre-service teachers.

The article draws on a sociocultural perspective on learning, with particular focus on Wertsch's (1998) distinction between *mastery* and *appropriation* of cultural artefacts. Mastery refers to *knowing how to* use an artefact, while appropriation is defined as "the process of taking something that belongs to others and make it one's own" (Wertsch, 1998, p. 53). These two concepts were used as a theoretical lens for studying teacher educators' and pre-service teachers' opportunities for appropriation of digital competence within

Results from the case study revealed that the two cases were more similar than what was expected from the curriculum analyses carried out in the first phase (Article I). The same challenges were found in both institutions: the conflict between mastery and appropriation, and between personal and educational use of technology, and the resistance towards technology among some teacher educators. Teacher educators in both cases reported that they used digital tools both for preparations, in the office, at home, and in the classroom. With the exception of interactive white-boards, they all also reported to have sufficient access to the required technology.

Also, although the two cases were initially chosen because of their potentially contrasting situation, the results did not reveal any major differences in terms of teacher educators rating of their own digital competence. In both cases most of the teacher educators rated their own level of competence and extent of technology use as being around average - some a little higher, some a little lower, but in general nearly similar to everyone else's. However, the results revealed that when asked to describe their own competence level, they primarily focused on the technical aspects of their competence, ignoring the didactic aspects of digital competence. As such, technical skills were used by teacher educators as a measure of their own digital competence.

The main findings from the focus-group interviews with pre-service teachers indicated that the students were split in their views on how much they had learned about use of educational technology in the teacher education programmes. While some students believed that the programme had contributed to increasing their competence level, others were critical to the technology training they had received because of a lack of hands-on experience with relevant tools such as interactive whiteboards. The discussion also revealed that students felt that attending lectures at the teacher education

programme had not given them any ideas for future teaching. For this reason they did not feel confident using this technology in the classroom.

It both cases it was also found examples of mastery without appropriation and resistance towards technology among teacher educators and pre-service teachers, and in case two an example of appropriation without mastery was also found. Together the results from the two cases highlight some important challenges regarding appropriation of digital competence in teacher education. In case of empirical implications, these results signify that in order to create opportunities for appropriation of digital competence and encourage use of technology as part of pre-service teachers' professional didactic competence, technology should be better integrated as pedagogical tools for teaching and learning in all subjects in the teacher education programmes. In order for this to happen, focus should be directed away from mastery of tools themselves and towards appropriation of a digital competence that embraces awareness of how technology can be used critically and reflectively in the process of building new knowledge.

The findings from the study guided the design of the questionnaires that were developed for the final phase of the study (presented in Article III).

5.1.3 Article III

Instefjord, E., & Munthe, E. (2017). Educating digitally competent teachers: A study of integration of professional digital competence in teacher education. *Teaching and Teacher Education, 67*(2017), pp. 37-45.

Research question: *How is professional digital competence integrated in initial teacher education?*

The third article is based on quantitative data and reports from data gathered though three national questionnaire surveys conducted among mentor teachers, teacher educators and pre-service teachers in Norway. In this article, integration of professional digital competence is studied both from an individual and an organizational perspective, focusing on factors that influence integration and use of technology in teacher education.

Summary and discussion

The article draws on previous research on uptake and use of technology in education, with particular focus on research that seeks to explain why technology is still not better integrated in curriculum activities, for instance by Harris, Mishra and Koehler (2009), Christensen and Knezek (Christensen & Knezek, 2008), Ertmer (1999) and Kopcha (2012). In their studies they found that lack of technology integration can be explained either by the methods used for integration of technology in education focusing too strongly on technical skills rather than focusing on pedagogy (Harris, Mishra, & Koehler, 2009), or by barriers that have an impact on teachers' use of technology such as confidence, beliefs and perceived value of technology (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012). Moreover, the article draws on Christensen and Knezeks *will, skill, tool* (WST) model (Christensen & Knezek, 2008) as a means to understanding the reality of technology integration in education. Knezek and Christensen (2008) maintain that 90% of the variance in level of technology integration in the classroom can be explained by teachers' *will* to use technology (technology attitudes), his or her *skills* in using technology (digital competence) and having satisfactory access to technology as a *tool* (access to technology) (Knezek & Christensen, 2008; Christensen & Knezek, 2008). Teachers' attitudes towards technology can also be seen in relation to teacher self-efficacy; "their belief in their ability to have a positive impact on student learning" (Ashton, 1985, p. 142). Further, Bandura (1977; 1997) and Tschannen-Moran, Woolfolk Hoy and Hoy's (1998) self-efficacy theory is used for understanding the relation between teachers' attitudes to technology and leadership in terms of administrative support.

In order to answer the main research question of the study, three sub-questions were asked:

1. How do teacher educators perceive their own digital competence, and how is this related to workplace support and their pedagogical efficacy?
2. How do mentor teachers' perceive their own competence, what they emphasize for students, and how do they perceive the emphasis of digital competence in teacher education?
3. How do pre-service teachers perceive the emphasis on digital competence in teacher education?

Data were collected through three online questionnaires, sent out to pre-service teachers, teacher educators and mentor teachers. Survey items were rated using a six point scale ranging from not at all (1) to to a very high degree (6) or from (1) strongly disagree to (6) strongly agree. Mean scores between 1 and 2.9 were interpreted as low, while scores between 3 and 4.9 were considered average and mean scores over 4.9 were considered high.

Results of the study show that teacher educators and pre-service teachers score their own competence at about the same level, while mentor teachers in schools report higher values for their competence. There are weak positive correlations between positive leadership, leadership support of instruction, and teacher educators' digital competence. Stronger positive correlations are found between teacher educators' self-reported efficacy and digital competence. It appears to be the case that digital competence is more of an individual factor than an organizational. Results are discussed in relation to teacher education's role in qualifying for professional work in digital classrooms.

The main contribution of the article is the design that includes respondents from three stakeholder groups; teacher educators, mentor teachers and pre-service teachers. By combining data from all three groups the design allows for results to be compared across the groups, something which enables a more holistic discussion of integration of professional digital competence in teacher education.

Despite some limitations that will be discussed later, we propose that this study has provided insight into the interrelated nature of development of pre-service teachers' professional digital competence in a Norwegian context. The findings suggest that we need to look more closely at how workplace support in higher education institutions can influence integration of digital competence among teacher educators, and that there is a need to look more closely at how and where digital competence for pre-service teachers is developed. What role does modelling play in teacher education and where will pre-service teachers gain access to necessary role models? These questions can be addressed in different research designs, not least in more experimentally oriented designs and longitudinal designs that can provide more information on factors that can promote professional digital competence

for teacher educators and pre-service teachers in initial teacher education programmes.

5.2 Discussion and research contribution

The main focus in the thesis is directed towards integration of professional digital competence in teacher education programmes. The thesis is funded on the assumption that pre-service teachers' experience with technology during the teacher education programme is a crucial factor influencing how they later chose to use technology in the classroom (Drent & Meelissen, 2008; Agyei & Voogt, 2011; Røkenes F. M., 2016). Hence, teacher education programmes should strive to integrate technology in order to contribute to increasing pre-service teachers' professional digital competence. Ultimately, teacher educators in all subjects in the programme should integrate use of technology as a core competence in their subjects in the same way as technology is used in a classroom. To find out how this is done in Norwegian teacher education, I started out by posing an overall research question and three sub-questions: *How do initial teacher education programmes in Norway attend to integration of technology and development of pre-service teachers' professional digital competence?*

1) Which knowledge areas of digital competence are addressed in national and local curriculum documents, and how?; 2) What opportunities for appropriation of digital competence does teacher education offer?; 3) How is professional digital competence integrated in initial teacher education?.

The sub-questions have been discussed individually in the three articles summarized above (Article I-III), while the overall research question is addressed through the thesis. In the following section, I will combine and discuss the results of the three studies in relation to this question.

5.2.1 The role of the curriculum

In the first phase of the study, focus was directed towards integration of professional digital competence in curriculum documents. As stated earlier (in chapter 3.2), curriculum documents represent what Goodlad, Klein and Tye (1979) refers to as *the formal curriculum level*, the second of five curriculum

levels describing the journey from ideological curriculum ideas (*ideal* and *formal* curriculum) towards an actual realization in the classroom by teachers (*perceived* and *operational*) and students (*experiential* curriculum).

All the curriculum documents that were analysed in the first phase of the study were collected in 2010, during the first semester of the new teacher education reform. At the time the curriculum documents were written, there were already strong political indications and ideas on the ideal curriculum level concerning the use of technology in education (Ministry of Education and Research, 2006a; Ministry of Education and Reseach, 2006b; Ministry of Education and Research, 2008; Ministry of Education and Reseach, 2009). All these policy documents suggested that digital competence would be given more emphasis both in school, in teacher education and as part of professional development for teachers. There was also a growing body of research that confirmed that pre-service teachers' experiences with use of technology during the teacher education programmes was a crucial factor influencing how they later chose to use technology in the classroom (Agyei & Voogt, 2011; Drent & Meelissen, 2008). Hence, considering the emphasis placed on digital competence in steering documents both nationally and globally, and the increased focus in school on the use of technology in all subjects, a teacher education reform introduced in 2010 can be expected to address questions of digital competence to a greater extent than previous reforms.

However, the overall interpretation of the findings in this study challenges this expectation. In the first article (Article I) we concluded that technology did not have a prominent position and that there were few intended learning outcomes for the integration of technology in curriculum documents (formal curriculum level), which is in line with results from previous research (Tømte, Kårstein, & Olsen, 2013). This indicates that something has been lost on the journey between the ideal and the formal curriculum level. Consequently, a relevant question to ask in this context is *why* there is not more focus on development of professional digital competence in the national curriculum documents. There could be several answers to this question, and one possible answer could be that educational use of technology is expected to be so integrated in content and working methods for teacher educators and pre-service teachers that it has not been clearly articulated in the curriculum as a separate part of teachers' professional competence. Such an interpretation

could for instance be grounded on research on TPACK (Angeli & Valanides, 2009; Koehler & Mishra, 2009; Mishra & Koehler, 2006).

Another interpretation may be that integration of digital competence is perceived as an institutional concern rather than a national concern. This interpretation gives teacher education institutions the full responsibility and challenges the culture of each institution. Previous studies have not found any major differences between teacher education institutions in terms of access to technology or amount of technology use (Norwegian Agency for Digital Learning in Higher Education, 2015; Tømte, Kårstein, & Olsen, 2013), which may be seen as an indication that every institution has the same potential when it comes to integration of digital competence. Although the analysis also reveal that technology plays a slightly stronger role in some subjects than in others, we do not have enough evidence to conclude that there are systematic differences in this regard. We did, however, find differences between institutions in terms of technology integration on the formal curriculum level, which led us to believe that there would also be notable differences between institutions on the perceived, operational and experiential curriculum levels.

Therefore, in the second and third phase of the study, we directed our focus towards the perceived, operational and experiential curriculum levels. The results from all three studies (Article I-III) indicate on the perceived, operational and experiential curriculum levels, integration of digital competence is more individual than institutional. This result adds to previous research which found that although an increased number of educational institutions have placed educational use of technology on the agenda, use of educational technology is in practice controlled by individuals and enthusiasts (Tømte, Kårstein, & Olsen, 2013; Norwegian Agency for Digital Learning in Higher Education, 2015). Teacher educators in Norway have freedom and opportunity for creative curriculum development extending far beyond the content of the national curriculum regulations. Thus, a pertinent question to ask in this context is what curriculum decisions teacher educators make at the instructional level (Goodlad J. I., 1979).

If a curriculum of a teacher education institution does not contain any mention of topics associated with professional digital competence in terms of technology proficiency, pedagogical compatibility or social awareness, one

might suspect that the use of digital tools is also omitted from the subjects within the teacher education programme. However, Goodlad, Klein and Tye argues that how teachers perceive the curriculum and what they actually choose to teach may be two quite different things (1979). As such, some teacher educators may have appropriated educational technology as a tool for both their teaching and the student teachers' learning to such an extent that they do not see the need for mentioning it in the course description. This appears to be the case for some of the teacher educators in the second phase of the study (Article II). Several of them report to use technology and discuss the educational use of such technologies with their students, despite the fact that their curriculum documents do not reflect these activities.

5.2.2 Knowledge areas of digital competence

Development of professional digital competence has been the overall focus, and one of the questions asked repeatedly throughout the study is what it means for a teacher to be digitally competent. A theoretical contribution of the thesis in this regard is the model developed in the first article (see Figure 3 and Article 1). The model is developed as a tool for operationalizing and clarifying the content of the concept "teachers' digital competence". In the model, inspired by Zhao, Pugh, Sheldon and Byers (2002), Krumsvik (2008), and Mishra and Koehler (2006), teachers' digital competence is understood as comprising the three knowledge areas *technology proficiency*, *pedagogical compatibility* and *social awareness*. A strength of this model is that it breaks down teacher's digital competence into three entities that are more easily bounded than the TPACK model (Mishra & Koehler, 2006), while simultaneously expanding on Zhao, Pugh, Sheldon and Byers' (2002), and Krumsviks (2008) models. The content of the three knowledge areas in the model also correspond to the seven competence areas found in the newly developed "Framework for teacher's professional digital competence" (Kelentrić, Helland, & Arstorp, 2017). However, the "Framework for teacher's professional digital competence" takes on a more practical approach than our model, breaking teachers' professional digital competence down to knowledge, skills and general competences. The risk of taking such an approach is that teachers' professional digital competence is reduced to instrumental, technical skills akin what we have defined as technology

proficiency in Article I. On the other hand, as the results of the second phase of my study indicate (Article II), teacher educators and pre-service teachers' still need a clearer concretisation of what it means to be a digitally competent teacher. Therefore, a potential extension to and further refinement of the model in Article I could be to combine the model with the "Framework for teacher's professional digital competence" in order to provide a model that fulfils both practical and theoretical requirements.

As discussed in Article I, the document analysis in the first phase showed that all three knowledge areas of teachers' digital competence could be identified in the national curriculum documents for teacher education programmes in Norway. However, none of the documents analysed embraced all three knowledge areas. This is an important finding from the first study, suggesting that the intertwined relationship between each of the knowledge areas of teachers' professional digital competence is not adequately acknowledged in curriculum documents. Pedagogical compatibility was the knowledge area that was emphasised in most of the documents, while social awareness was found in only one of the curriculum documents included, in the description of learning outcome for candidates of both streams in the national curriculum regulations. Similar results were found in the local curriculum documents. Hence, the results reveal a slight emphasis on pedagogical compatibility compared to other knowledge areas of digital competence. The emphasis on this knowledge area is consistent with recommendations from research literature suggesting that teacher education need to "move beyond basic ICT skills and use of ICT as a tool, to find ways of building the interpretive and creative potential of ICT into teacher training" (Tømte, Hovdhaugen, & Solum, 2009, p. 25).

However, in spite of the emphasis on pedagogical compatibility identified in the curriculum documents (Article I), the results from the second phase (Article II) indicate that most of the teacher educators who were interviewed still saw digital competence as a question of technical skills. In their descriptions of their own digital competence, they primarily focused on their technical skills (i.e. technology proficiency, Article I) and how well they believed that they mastered (Wertsch, 1998) the necessary technological artefacts, rather than focusing on pedagogical (i.e. pedagogical compatibility, Article I) or social and ethical aspects (i.e. social awareness, Article I) related

to the use of technology in teaching and learning. As such, this gives us reason to assume that there may be discrepancy between the formal, and the perceived and operational curriculum levels concerning which areas of digital competence that are emphasised.

On the other hand, the results from the third phase of the study (Article III) challenge this assumption. In the teacher educator survey, teacher educators' digital competence was measured by a 6-item sum score variable with a mean core of 3.54. The items returning the lowest mean score within this sum score variable regards teacher educators proficiency in the use of interactive white boards (M=2.94), while the variable related to whether teacher educators see themselves as good role models for their students regarding the use of digital tools for teaching received one of the highest mean scores (M=3.90). Hence, despite the fact that only 18.6% of teacher educators use the two highest values (5 and 6) to indicate their own proficiency in the use of interactive white boards, a quite common tool in most schools, 35% of them see themselves as good (values 5 and 6) role models concerning the use of digital tools for teaching. As such, these results may suggest that although they do not emphasise competence corresponding to pedagogical compatibility and social awareness in their descriptions of their own digital competence (Article II), they still use technology actively in their teaching in a way they believe their students can learn from. There might be reason to believe that they have more emphasis on pedagogical compatibility than the results from the second phase (Article II) suggest. Consequently, if we combine the results from the second phase (Article II) with the results from the teacher educator survey in the third phase of the study (Article III) we may argue that teacher educators *are* conscious of their responsibility regarding all three knowledge areas of digital competence, even though the knowledge areas are not equally emphasised on the formal curriculum level.

So far in the discussion I have focused primarily on results related to the formal, perceived and operational levels, and less focus has been directed towards the experiential curriculum level. To sum up the discussion I will therefore now direct focus towards the experiential curriculum level, and discuss how professional digital competence is integrated in the teacher education programmes, seen from the student perspective. Related results are found in both the second (Article II) and the third (Article III) phase of the

study. In the multiple-case study in phase two, I asked pre-service teachers in both cases about how much they believed that the programme had contributed to increasing their professional digital competence. The answers indicated that the pre-service teachers were split in their views on how much they had learned from the programmes regarding use of technology. Some of they believed that the programme had contributed to increasing their digital competence, while others were of the opinion that their digital competence had been acquired *before* they started the programme. The survey in the third phase of the study (Article III) provides similar results. Together, these findings add to previous studies which have found that although pre-service teachers' self-perceived ICT skills improved during the programme, not all students felt that the programme had contributed to increasing their comfort level in use of technology for educational purposes (Martinovic & Zhang, 2012; Røkenes F. M., 2016). Seen from a teacher education perspective, these findings emphasise a need for more focus on helping pre-service teachers transfer their personal competence into a pedagogical practice of using technology as a teacher (So, Choi, Lim, & Xiong, 2012) (e.g. building relations between their technological proficiency and their pedagogical compatibility).

Previous studies have found that teachers who actively use ICT in teaching and manage to combine various knowledge areas such as technology, pedagogy and subject knowledge within their own teaching serve as good role models for pre-service teachers (Tømte, Enochsson, Buskquist, & Kårstein, 2015; Røkenes & Krumsvik, 2016; Chai, Koh, Tsai, & Tan, 2011; Lunenberg, Korthagen, & Swennen, 2007; Tezci, 2011; Sweeney & Drummond, 2013). In the third phase of the study (Article III) contrasting results regarding teacher educators as role models were found between the student survey and the teacher educator survey. While only 13.1% of the teacher educators use score 1 and 2 (1=strongly disagree), as much as 50.6 % of the pre-service score these two values. Thus, it appears that pre-service teachers are less positive about their teachers as role models than the teacher educators themselves are. This finding adds to the results from Røkenes and Krumsvik (2014), stating that "not all student teachers perceived their teacher educators as role models for their own use of ICT in teaching" (Røkenes & Krumsvik, 2014, p. 9). Considering that existing research has found modelling by teacher educators

is to be one of the most frequently used approaches for developing pre-service teachers' digital competence (Røkenes & Krumsvik, 2016; Røkenes & Krumsvik, 2014; Tondeur, et al., 2012; Lambert, Gong, & Cuper, 2008), this discrepancy between the two sets of data should be explored through further research.

5.2.3 Workplace support

In the third phase of the study (Article III) we investigated the relationship between workplace support and digital competence. In the present section this relationship will be discussed further. However, as the study does not contain any data concerning support for pre-service teachers, the discussion is limited to workplace support for teacher educators. As stated in chapter 2, aspects related to workplace support for teachers are frequently mentioned in research literature on integration of technology in teaching and learning (Røkenes & Krumsvik, 2016), and lack of support is found to be one of the factors that prevent teachers from using technology (Mumtaz, 2000; Inan & Lowther, 2010; Kopcha, 2012; Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012; Tezci, 2011). According to self-efficacy theory, workplace support is also strongly related to teacher efficacy (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998), and in the third phase of the study (Article III) we found positive correlations between efficacy and digital competence ($r = 0.252^{**}$), suggesting that teachers with a higher sense of efficacy are more open to new ideas.

As we have argued in Article III, workplace support can be regarded as relational (i.e. having positive relations and feeling supported personally) or organisational (i.e. that the organisation provides systemic support), and therefore we chose to divide the workplace support variable into two constructs; "Positive management" and "Managements' development support" (see Article III for a detailed overview of the content of each of these variables). The results of our study show weak positive correlations between positive management, management's development support and teacher educators' digital competence, which means that our study confirms the results from the above referred studies.

In the article (Article III) we also establish that there are some interesting variations within institutions regarding how teacher educators perceive the support they get from their leaders in relation to development of teaching and management development support. When studying the results from each of the teacher education institutions we found that the variation in perception appears to be more individual than organisational:

> Perception of support concerning teaching/instruction appears to vary within HEIs and appears to be more of an individual perception than an organizational. This might be an indicator of the continued individuality at the HEI level, and perhaps also an indication that workplace support of this kind may be less developed (Instefjord & Munthe, 2017, p. 43).

This quote summarises and recognises some significant challenges in Norwegian teacher education programmes regarding workplace support, which are largely in line with findings from other national studies (Hetland & Solum, 2008; Wilhelmsen, Ørnes, Kristiansen, & Breivik, 2009; Tømte, Hovdhaugen, & Solum, 2009; Gudmundsdottir, Loftsgarden, & Ottestad, 2014; Tømte, Kårstein, & Olsen, 2013; Ørnes, Wilhelmsen, & Solstad, 2011). Drawing on evidence from previous research, along with the results from my study regarding workplace support, there is reason to argue that effort should be made in order to overcome these challenges. Consequently, in the following section some suggestions for action are proposed.

A starting point might be to map existing competence in teacher education, and develop a systematic support strategy which embraces potential measures associated with both "Positive management" and "Management's development support" (see Article III for details). Second, to increase the level of support related to "Positive management", the first action that could be taken is to work systematically to increase the leaders' own professional digital competence. Unless their competence is adequately high they will not be able to provide the necessary support for development of new plans for teacher education, nor will they be able to create good implementation systems for new curriculum initiatives. Therefore, leaders should participate in professional development initiatives such as the specialist education for teachers in professional digital or corresponding programmes. Although the use of single technology courses as a strategy for development of digital

competence in teacher education are commonly criticised for teaching technological skills (i.e. technological proficiency, see Article I) in isolation and not part of specific subjects (Polly, Mims, Shepherd, & Inan, 2010; Tømte C. E., 2013), such courses are also found to provide a good overview of technological resources (Kay, 2006). As such, participating in such courses may contribute to help leaders to convince teacher educators of the benefit and value of using technology, which may in turn foster positive attitudes towards technology (Funkhouser & Mouza, 2013; Ertmer P. A., Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012).

Further, in order to increase the level of support in terms of "Management's development support" the following measures are proposed:

1) More members of staff, with a combination of technical and pedagogical competence, should be employed in the teacher education institutions
2) Financial support should be given to teacher educators who wish to develop their own teaching
3) Teacher educators should be encouraged and stimulated to participate in national initiatives for development of professional digital competence (e.g. PfDK-MOOC or specialist education for teachers in professional digital competence).

Previous studies have concluded that development of digital competence in teacher education is to a great extent dependent on individual teacher educators' efforts (Tømte, Kårstein, & Olsen, 2013; Gudmundsdottir, Loftsgarden, & Ottestad, 2014; Norwegian Agency for Digital Learning in Higher Education, 2015). The results of my study largely support this conclusion. Therefore, regarding the third measure proposed above, the decision to which professional development activities should be undertaken should no longer be left to the individual teacher educators, but should be made by the management in correspondence with the results of an initial competence mapping.

5.2.4 Methodological contribution

The use of mixed methods research (Creswell & Plano Clark, 2011) with a multiphase design can be considered as one of the main methodological contributions of the thesis. One of the strengths of a multiphase design is that "it incorporates the flexibility needed to utilize the mixed methods design elements required to address a set of interconnected research questions" (Creswell & Plano Clark, 2011, p. 101). In my study, the use of a multiphase design allowed me to carry out my research in phases, where the results from one phase directly contributed to the design of the next phase. This enabled a more thorough investigation of the overall research question and provided an increased ownership of the process of generating data, which allowed me to be better informed about the relationships between the key components of my research. In this context, the various sources of data, from curriculum documents collected in the first phase, interviews with teacher educators and pre-service teachers in the second phase, and data from the large-scale survey in the third phase, contributed to painting a picture of how development of professional digital competence is attended to at the *formal* and *perceived*, *operational* and *experiential* curriculum levels (Goodlad, Klein, & Tye, 1979).

Another methodological contribution is related to the transparency of methods used in the study. Transparency is recognized as a basic requirement of all research (Creswell, 2009), and can encourage other researchers to carry out similar studies. In each of the articles, methods used for each phase of the study are thoroughly described, and in the thesis the details concerning research design and methods, data collection, data analysis and research quality are discussed further.

A final methodological contribution regards the use of a large-scale survey in the third phase of the study. The use of a survey to explore use of technology in higher education is not new. This has been done by for instance Tømte, Kårstein and Olsen (2013). However, what makes our study particularly interesting is the design that involves both teacher educators, pre-service teachers and mentor teachers. By combining data from all three groups, the design allows results to be compared across the groups, something that

enables a more holistic discussion seen from both an individual and an organizational perspective.

5.2.5 Limitations and implications for future research

As with all research, this study has its limitations, and as a final point of the discussion it is important to acknowledge these limitations. In the case study in the second phase of the study, I selected two different teacher education institutions in order to get a comparative perspective on development of professional digital competence in teacher education institutions in Norway. In the initial design of the study, before analysing the local curriculum documents, I assumed that the analysis of these documents would identify *more* differences both between institutions and from one subject to another. However, as discussed in Article I, we did not find any great differences in how institutions emphasised the three knowledge areas in the curriculum documents. This can most likely be explained by the fact that the institutions developed their programme descriptions on the basis of the national curriculum documents. Hence, the local documents reflected more of the central ideas for development of professional digital competence within teacher education than local variations. Therefore, the selection of institutions for the second phase of the study was based on minor differences found between institutions.

A second limitation is related to the nature of the data collected through focus group interviews. While focus group interviews are useful for exploring ideas (Johnson & Turner, 2003) and interaction as a means of producing a more complete understanding of the issues discussed (Halkier, 2010; Gibbs, 2012), the possibility of the discussion being dominated by one or two students must be taken into consideration. Although the task of the moderator in a focus group discussion is to present the issues in question and create an open atmosphere where the participants are comfortable expressing their attitudes, students may be influenced by the more dominant participants in the group and thus be less inclined to present their personal opinions (Kvale & Brinkmann, 2009; Johnson & Turner, 2003; Gibbs, 2012).

In the third phase of the study, data were collected through three questionnaires, and several limitations can be found in this regard. The first

limitation is related to the low number of answers per institution. It would have been interesting to compare institutions, but due to the great variation in responses from higher education institutions this was not possible. As discussed in the article reporting from this study (Article III), a study with a more balanced response design could also conduct other analyses, including multi-level analyses to investigate workplace support variables' influence on use of instructional technology. Future studies could also develop second order latent measures to address the multidimensionality of the concept of "professional digital competence".

While there is a commonly found assumption that todays' pre-service teachers have high technological competence, it remains unclear whether these skills exist or exist equally among all pre-service teachers (Funkhouser & Mouza, 2013). In the future, it may therefore be beneficial to examine the pre-service teachers' and teacher educators' professional digital competence through a survey, with several items related to both their technological proficiency, pedagogical compatibility and social awareness (Zhao, Pugh, Sheldon, & Byers, 2002; Instefjord & Munthe, 2016). Such a study could provide useful knowledge about which areas of professional digital competence pre-service teachers' need more knowledge about, and could in turn contribute to closing the gap between the technology available in classrooms and teachers' use of technology for educational purposes (Kopcha, 2012; Petko, 2012; Zhao, Pugh, Sheldon, & Byers, 2002; Ten Brummelhuis & Kuiper, 2008; Bate, Day, & Macnish, 2013).

Second, there is also a need to conduct a longitudinal study of pre-service teachers' development of professional digital competence, comparing their professional digital competence in the first year of the programme to their competence at the end of the programme. In this way, the effectiveness of different strategies for preparing pre-service teachers to use technology could be measured.

In regards to teachers educators' professional digital competence, findings suggest that further research is needed to explore the impact of ongoing professional development efforts related to development of professional digital competence. Such studies should include aspects related to workplace

support, both in terms of "Positive management" and "Managements' development support".

5.3 Concluding remarks

Since the data collection for this thesis began in 2010 my understanding of what it means to be a digitally competent teacher has developed. At the same time, my own research, media and other researchers have reminded me that development of pre-service teachers' professional digital competence still remains a challenge for many teacher education institutions. This thesis is my contribution towards redressing this situation.

As discussed throughout the thesis, digital competence is regarded a necessary competence for full participation in society in the 21st century, and knowing how to use technology for educational purposes is an essential part of teachers' professional competence today. Therefore, integration of technology and development of pre-service teachers' professional digital competence needs to be emphasised in initial teacher education programmes. In the opening chapter I presented the hypothesis that clear descriptions of what pre-service teachers are expected to know and be able to do in relation to use of technology and development of professional digital competence can contribute to increasing the opportunities for appropriation of digital competence.

The results of the study confirm this hypothesis. The lack of technology integration identified on the formal curriculum level was also found on the perceived, operational and experiential levels. Further, one of the main empirical contributions of the thesis is increased knowledge about how teacher education institutions in Norway attend to the integration of technology and development of pre-service teachers' professional digital competence. The overall interpretation is that professional digital competence is integrated to a limited extent in Norwegian teacher education programmes. This conclusion is drawn on the basis of the results from all three phases of the study (Article I-III).

As reported in Article I, the results from the document analysis in the first phase indicate that the emphasis on and integration of professional digital

competence in curriculum documents is rather limited. The analysis also reveals that technology plays a slightly stronger role in some subjects than in others. There are for instance more examples of technology proficiency found in the subject description of Norwegian and Pedagogy and Pupil-related Skills than in the subject descriptions for mathematics. On the other hand, subject specific variations are not similarly clear for pedagogical compatibility. Examples of pedagogical compatibility are identified for all subjects included in the analysis, suggesting that this type of knowledge has been devoted equal attention across subjects. Thus, the results do not provide enough evidence to claim that some subjects in the teacher education programmes have assumed more responsibility for integration of technology than others, or to conclude that technology is more integrated in one subject than in another.

The overall interpretation of the three studies is that there are only minor differences between the individual teacher education institutions in terms of integration of technology in curriculum documents, and teacher educators and pre-service teachers' understanding of professional digital competence. Teacher educators, pre-service teachers and mentor teacher in all institutions score their own competence as relatively high. Nevertheless, the results indicate that pre-service teachers are less positive about their teachers as role models than the teacher educators themselves are. This may indicate that there is still a way to go before development of pre-service teachers' professional digital competence is integrated in both the curriculum and the teaching practices of teacher education institutions.

The thesis opened with a quote from the story about Alice's adventures in Wonderland (Carroll, 1920). The conversation between Alice and the Cat may be used to illustrate one of the many challenges found in relation to integration of professional digital competence in teacher education. How can you pick a road to somewhere when you do not know where you want to go? Or how do you get "there" when you do not know or do not care where "there" is? If neither pre-service teachers nor teacher educators know what professional digital competence is or have a rationale for their use of technology in education, it is hard to know which way to go in order to acquire the necessary competence. And as long as curriculum documents do not accentuate professional digital competence as part of the learning outcomes for pre-service teachers, it is challenging for both teacher educators

and pre-service teachers to find their way. As such, the first step towards deciding where to go with technology integration in teacher education is to better define what it means to be a professional digitally competent teacher and what pre-service teachers are expected to learn in this regards. As researchers we have an obligation to contribute to drawing a map that can help teachers find their way towards a better integration of professional digital competence in teacher education. Hopefully, this thesis and three articles in the thesis have made a small contribution in this regard.

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Part II: Publications

Article I

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Preparing pre-service teachers to integrate technology: an analysis of the emphasis on digital competence in teacher education curricula

Elen Instefjord & Elaine Munthe

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Preparing pre-service teachers to integrate technology: an analysis of the emphasis on digital competence in teacher education curricula

Elen Instefjord[a]* and Elaine Munthe[b]

[a]*Faculty of Teacher and Cultural Education, Stord/Haugesund University College, Stord, Norway;* [b]*Faculty of Arts and Education, University of Stavanger, Stavanger, Norway*

This article focuses on integration of digital competence in curriculum documents for teacher education in Norway. A model inspired by the work of Zhao, Pugh, Sheldon and Byers, as well as Krumsvik and Mishra and Koehler, has been developed as an analytical framework. Teachers' digital competence is here understood as comprising three knowledge areas: *technology proficiency*, *pedagogical compatibility* and *social awareness*. National guidelines and curriculum regulations, along with programme descriptions from 19 teacher education institutions, have been analysed using this framework. Results indicate that use of technology does not have a prominent position in curriculum documents. There are few binding learning outcomes for the integration of technology, suggesting that digital competence is still not regarded as an important component of teachers' professional competence. By clarifying the content of the concept, 'teachers' digital competence', this article aims to contribute to increasing teacher educators' awareness of which areas of knowledge they integrate into their curricula, what the goal of this knowledge is and which strategies are best suited to help pre-service teachers acquire this knowledge.

Keywords: Pre-service teacher education; computer uses in education; teacher knowledge; computer literacy; teacher education curriculum

Introduction

Teachers play a decisive role in the uptake and use of technology in classrooms Olofsson et al. 2011), and experience from teacher education programmes is a crucial factor influencing new teachers' use of technology (Drent and Meelissen 2008; Agyei and Voogt 2011). Teacher education programmes are, however, criticised for their failure to provide pre-service teachers with the necessary experiences of how to utilise technology in a teaching practice (Montgomerie and Irvine 2001; Wilhelmsen et al. 2009; Chien et al. 2012; Tømte, Kårstein, and Olsen 2013).

Research shows that beginning teachers do not feel well prepared to use technology effectively in their teaching (Sang et al. 2010), and pre-service teachers in Canada (Martinovic and Zhang 2012) and in Norway (Wilhelmsen et al. 2009) report that technology is more frequently used in school than in the teacher education programme. There also appears to be a discrepancy between pre-service teachers' and teacher educators' opinions of whether digital competence is emphasised in teacher education programmes in Norway. While nearly 70% of teacher educators

*Corresponding author. Email: elen.instefjord@hsh.no

believe that students acquire relevant digital competence through the programme, less than half of the pre-service teachers report that their education has taught them how to use technology in the classroom (Wilhelmsen et al. 2009). Against this backdrop it is of great significance to explore further how teacher education aims to prepare pre-service teachers to use technology in their future classrooms. The case in this study is Norway, where a teacher education reform for the 4-year programmes to qualify for teaching in the compulsory school years (grades 1–10) has been implemented since 2010. The reform is based on the government's suggestions in a White Paper on Teacher Education 'The teacher – the role and the education' (Ministry of Education and Research 2009). The White Paper emphasises competence in school subjects and how subjects may contribute to the learning of basic skills as one of fundamental areas of competence essential for all teachers. This involves the development of new learning outcomes for pre-service teachers, both at the programme level and at the subject level. A teacher education reform introduced in 2010 can also be expected to address questions of digital competence to a greater extent than previous reforms considering the emphasis placed on digital competence in primary and secondary school. The research question addressed in this article is: *which knowledge areas of digital competence are addressed in national and local curriculum documents, and how?*

Conceptual framework

In autumn 2006, 'The Knowledge Promotion Reform', a curriculum reform for primary and secondary education, was introduced in Norway. In the reform, five basic skills that were to be integrated and adapted to all subjects were highlighted: the ability to express oneself orally, the ability to read, numeracy, the ability to express oneself in writing and *the ability to use digital tools*. Thus, since 2006 the use of digital tools has been an important component of all levels of education for both students and teachers in Norway. At the same time, *digital competence* was acknowledged and recommended as one of the eight key competences for lifelong learning for all citizens of the European Union (European Commission 2006). Since then, a number of attempts have been made towards developing a common understanding of the notion digital competence, and in a recent report from the Joint Research Centre of the European Commission the following definition is suggested:

> Digital Competence is the set of knowledge, skills, attitudes, abilities, strategies and awareness that are required when using ICT and digital media to perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively for work, leisure, participation, learning and socialising. (Ferrari 2012, 30)

The definition illustrates the complexity of the concept by indicating that digital competence involves far more than technical skills. This same complexity can be recognised in the numerous attempts to identify what kind of competence teachers need in order to help students develop a digital competence that is in line with the above definition. Teachers' digital competence is distinguished from other technology users based on their focus on education and instruction, in addition to everyday digital competence in using technology for personal purposes such as e-mail, social communication and entertainment (Krumsvik 2008).

Zhao, Pugh, Sheldon and Byers maintain that in order to integrate technology successfully in the classroom, three knowledge areas associated with teachers' digital competence are necessary: *technology proficiency*, *pedagogical compatibility* and *social awareness* (Zhao et al. 2002). Similarly, Mishra and Koehler argue that thoughtful pedagogical use of technology requires the development of a complex, situated form of knowledge (Mishra and Koehler 2006). Based on the assumption that technology integration should be related to specific subject areas, they added technology as a key component to Shulman's pedagogical content knowledge framework (Shulman 1986, 1987). In their framework, three interdependent components of teacher knowledge are incorporated: content knowledge, pedagogical knowledge and technological knowledge (Koehler and Punya 2008). In the interactions among these bodies of knowledge, four other types of knowledge are constructed: technological content knowledge, technological pedagogical knowledge, pedagogical content knowledge and, finally, technological pedagogical content knowledge (TPACK) (Harris, Mishra, and Koehler, 2009).

All these knowledge areas represent important competences for teachers. Nevertheless, the TPACK framework has been criticised for having unclear boundaries (Angeli and Valanides 2009) and lack of understanding amongst the knowledge areas (Chai et al. 2011). Due to the complexity, the TPACK framework can therefore appear to be less accessible in the discussion of the content of teachers' digital competence. However, as we will discuss in the following sections, when seen within the borders of Zhao, Pugh, Sheldon and Byers' framework, the knowledge areas become more accessible and can thus contribute to a better understanding of the content of teachers' digital competence.

In Norway, Krumsvik (2008) digital competence model is commonly used to describe the content of teachers' digital competence and may thus help situate the research to a Norwegian context. However, neither this model can alone provide an adequate level of detail to fully analyse which knowledge areas of digital competence is addressed in curriculum documents. Thus, a combination of all three may contribute to producing a clearer lens for studying the integration of digital competence in teacher education. In Figure 1, the concepts are referred to in relation to the overarching concept 'Teachers' digital competence'. While the TPACK framework and Krumsvik's digital competence model share some common ideas about the development of teachers' digital competence, Zhao et al. (2002) view of teacher as innovator presents some new aspects to the integration of technology in the classroom that are not included to the same extent in the other models. The view of teachers' digital competence is broadened by including the realisation of school realities student teachers are likely to encounter in their future work environments (Zhao et al. 2002; Martinovic and Zhang 2012). In the following sections a further presentation of the concepts will be provided.

Technology proficiency, the first area of knowledge conceptualised by Zhao et al. (2002) involves not merely technical skills in terms of knowledge of how to operate the technology; it also involves an understanding of the enabling conditions of a technology. These conditions are necessary in order to use a specific technology for teaching. As such, technology proficiency incorporates two of the components from the TPACK-framework: technological knowledge and technological content knowledge. Succinctly, technological knowledge can be understood as having knowledge about basic hardware or being able to use standard software effectively in everyday life; and technological content knowledge deals with the relationship

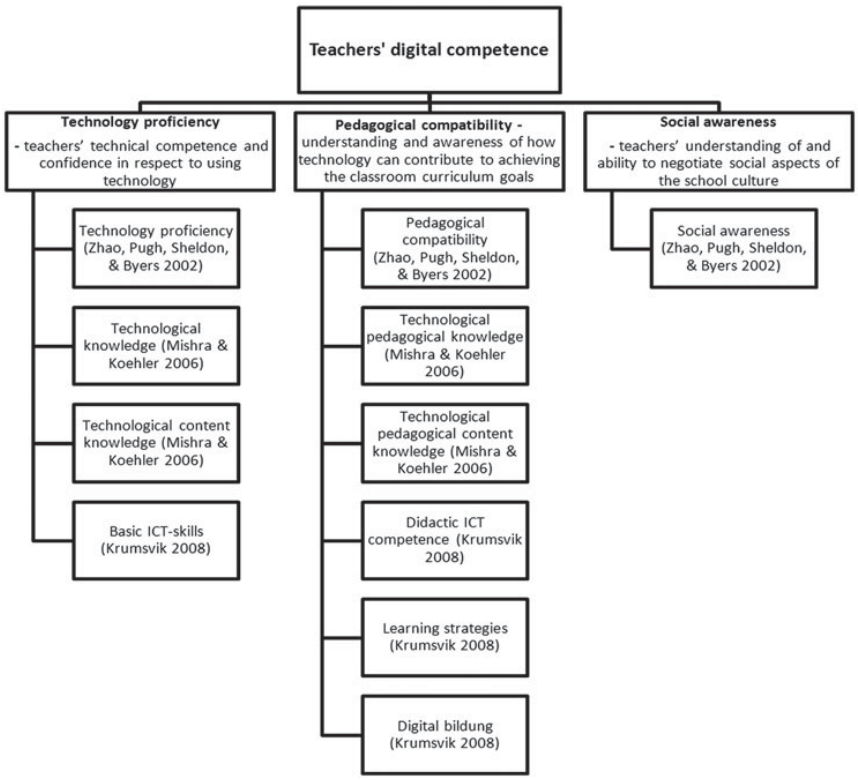

Figure 1. Teachers' digital competence.

between content and technology and how the content can be altered by the application of technology (Harris, Mishra, and Koehler 2009). This knowledge is similar to the area of knowledge that Krumsvik (2008) refers to as *basic ICT skills* in his digital competence model. Basic ICT skills are conceptualised as having knowledge about standard digital tools and how these tools can be used in school and in society in general. In this article technology proficiency is understood as teachers' technical competence and confidence in respect to using technology. This understanding is in line with Ferraris' (Ferrari 2012) definition of digital competence, but is expanded to also include the teacher perspective. For pre-service teachers, technology proficiency will constitute a key competence for their own learning during teacher training as well as an essential component of the professional teacher competence that they are to acquire through teacher training.

The second area of digital competence in Zhao et al. (2002) framework is referred to as teachers' *pedagogical compatibility*. The concept embraces technological pedagogical knowledge and technological pedagogical content knowledge from the TPACK-framework, and Krumsvik's notions of didactic ICT competence learning strategies and digital bildung. It is within this area of knowledge the influence from Shulman's framework (Shulman, 1986) is most easily recognised. Koehler and

Mishra (2009) describe technological pedagogical knowledge as knowledge of existence, affordances and constraints of various technologies, and how technology is related to pedagogical designs and strategies. Technological pedagogical content knowledge is understood as the knowledge required for integrating technology in any content area (Koehler and Mishra 2009).

Shulman's concept of pedagogical content knowledge (Shulman 1987) can also be recognised in Krumsvik's notion of *didactic ICT competence*. Teachers' ability to support students in their development of productive learning *strategies* in relation to the use of technology is also seen as an essential area of teachers' digital competence. These strategies are interdisciplinary, focusing on pupils' meta-cognitive skills and how technology may be employed as a tool for learning (Krumsvik 2008). The last component of the digital competence model, *digital bildung*, is described as an intersection between basic ICT skills, didactic ICT competence and strategies, focusing on how the teacher should attain a meta-perspective on these components in order to help students move from *digital natives* (Prensky 2001) to *digital citizens* (Ribble 2009). Ribble defines digital citizenship as 'the norms of behaviour in regard to technology use' (Ribble 2009, 251). In an educational context, knowledge of these norms, such as critical use of sources, ethical awareness and netiquette, is essential for learning, sharing and interacting with technology.

While the TPACK-framework is criticised for not taking teachers' epistemic beliefs and values about teaching and learning into consideration (Angeli and Valanides 2009) pedagogical compatibility encompasses the compatibility between the teacher's pedagogical knowledge and beliefs, content knowledge and technology. Teachers who are aware of their own pedagogical beliefs and consciously use technology that is compatible with their beliefs are found to be more likely to succeed with implementing technology in the classroom. (Zhao et al. 2002; Ertmer 2005). In this article pedagogical compatibility is conceptualised as teachers' understanding and awareness of how technology can contribute to achieving the classroom curriculum goals. By increasing teachers' digital competence through a mental competence journey (Krumsvik 2008), they become more aware of the possibilities provided by technology and may thus develop the necessary competence in order to integrate technology efficiently in their teaching (Christensen 2002; Krumsvik 2008; Agyei and Voogt 2011). Seen from a teacher education perspective this underlines the necessity of providing pre-service teachers with both technical competence and awareness in order to move away from the technical aspects of technology towards a better understanding of technology as an educational resource.

The third area of knowledge associated with teachers' digital competence is social awareness, focusing on the impact of teachers' understanding of and ability to negotiate social aspects of the school culture. First, when using digital tools in the classroom, teachers often encounter technical difficulties beyond the teachers' control. Knowledge about social dynamics and, for instance, whom to contact for technical or administrative support, is therefore helpful for successful technology integration. Secondly, technology-based projects may open traditionally private classroom activities to more public arenas and expose students to environments outside the classroom. A social aware teacher will, according to Zhao et al. (2002), be better qualified to foresee potential problems in relation to the use of technology, and is thus more likely to attain successful technology integration. Similar emphasis on understanding the social aspects of the school culture is found neither in the TPACK-framework nor the digital competence model. Therefore, his concept is

understood solely as described by Zhao et al. (2002). None the less, the significance of understanding social aspects surrounding the teacher and the actual classroom where technology is to be integrated should not be underestimated.

Methods

Considering the emphasis placed on digital competence globally and the increased amount of research to base the construction of learning outcomes on, a teacher education reform introduced in 2010 can be expected to address questions of digital competence to a greater extent than previous reforms. This study has therefore investigated the following research question: w*hich knowledge areas of digital competence are addressed in national and local curriculum documents, and how?*

In order to answer this question, curriculum documents for teacher education institutions in Norway have been analysed. Curriculum documents are the 'official statement of what students are expected to know and be able to do' (Levin 2008, 8). Goodlad, Klein, and Tye (1979) have identified five levels of curriculum development: an ideological curriculum level, a formal curriculum level, a perceived curriculum level, an operational curriculum level and, finally, an experiential curriculum level. The five levels describe the journey from ideological curriculum ideas (*ideal* and *formal* curriculum) towards actual realisation in the classroom by teachers (*perceived* and *operational*) and students (*experiential*). Only the second level, the *formal* curriculum, is discussed in this article. In order to understand the background for what is actualised in the classroom, it is significant to draw attention towards this level. Neither students' experiences nor ideological curriculum ideas can give us this information, and written curriculum documents are therefore an important source of information in the search for a deeper understanding of the extent of technology integration in teacher education.

Data collection

Data consist of national curriculum regulations, national guidelines and local programme descriptions from 19 out of 20 institutions providing teacher education in Norway in 2010. Due to language barriers programme descriptions from the Sámi University College were not included. The programme descriptions were all collected during autumn 2010, the first semester of the new teacher education reform. General descriptions, along with the subject specific descriptions for Pedagogy and Pupil-related Skills, which is compulsory for students in both steams, and Norwegian and mathematics, which are compulsory for grades 1–7, were included. The curriculum documents included in the analysis are as follows:

- National curriculum documents
  - o National curriculum regulations, established by the Ministry of Education and Research 01.03. 2010 (6 pages).
  - o National guidelines:
    - (a) 1–7: general provisions, subject specific descriptions for Norwegian, Pedagogy and Pupil-related Skills and mathematics.
    - (b) 5–10: general provisions.
- Local curriculum documents

- Institutions' programme descriptions ($N = 19$)
  (a) 1–7: general provisions, subject specific descriptions for Norwegian, Pedagogy and Pupil-related Skills and mathematics.
  (b) 5–10: general provisions.

The national curriculum documents provide a background for the local curriculum documents. In this analysis emphasis has been placed on the local programme descriptions as these are the formal curriculum that constitutes the binding agreement between institutions and their students.

Qualitative content analysis

Qualitative content analysis was used for analysing the curriculum documents. Krippendorff defines content analysis as a 'research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use' (Krippendorff 2004, 18). The analysis was carried out following Zhang and Wildemuth's eight steps for conducting qualitative content analysis; (1) prepare the data, (2) define the unit of analysis, (3) develop categories and a coding scheme, (4) test your coding scheme on a sample of text, (5) code all text, (6) assess your coding consistency, (7) draw conclusions from the coded data, and (8) report your methods and findings (Zhang and Wildemuth 2009, 3–5).

After preparing the data, the unit of analysis was defined by closely reading the curriculum documents several times. During the first reading, all mentions of basic skills, digital tools, technology and ICT were highlighted. This reading also provided an overview of the structural variations of the documents included. In the second reading, the highlighted sentences were extracted and systematised according to the categories *introduction, knowledge, skills, general competence* and *other.* The categories *knowledge, skills* and *general competence* were defined on the basis of the National Qualifications Framework and were used in the programme descriptions to specify learning outcome. The categories *introduction* and *other* were developed as organisational categories for content not related to learning outcome, and embraced for instance educational methods, structure and form of instruction.

In the next step of the analysis, the excerpts were encoded according to the three knowledge areas *technology proficiency, pedagogical compatibility* and *social awareness* (Figure 1).

Results

In the analysis of the national curriculum documents, few examples of *technology proficiency, pedagogical compatibility* and *social awareness* were found. The results are summarised in Table 1.

As illustrated, all three knowledge areas have been identified in the national curriculum documents included. While the national curriculum regulation contains no examples of technology proficiency, use of digital tools as a basic skill is emphasised in the national guidelines as one of several responsibilities that the institutions should pay particular attention to. Two occurrences of basic skills are found in the general provisions of the national guidelines – one that can be related to technology proficiency and one that is associated with pedagogical compatibility.

Table 1. Digital competence in national curriculum documents.

	National curriculum regulations	National guidelines – general provisions	National guidelines – pedagogy and pupil-related skills	National guidelines – Mathematics	National guidelines – Norwegian
Technology proficiency		Basic skills: the basic skills – being able to express oneself orally and in writing, being able to read, numeracy, and being able to use digital tools – are both a prerequisite for developing academic knowledge and part of the academic competence in all subjects (Ministry of Education and Research 2010b, 6)	The student has knowledge about use of digital tools (Ministry of Education and Research 2010c, 17, Ministry of Education and Research 2010d, 17) (our translation)	The student has knowledge about how to express himself orally, reading, how to express himself in writing, and can use digital tools in mathematics (Ministry of Education and Research 2010c, 34) (our translation)	They should learn to work with the basic skills in expressing themselves orally, reading, expressing themselves in writing, numeracy and using digital tools in the Norwegian subject, and across subjects (Ministry of Education and Research 2010c, 29) (our translation) The student can use digital tools in the subject and can create and evaluate digital multimodal texts (Ministry of Education and Research 2010c, 30) (our translation)
Pedagogical compatibility	Ensure progression in the instruction of the basic skills adapted to pupils (Ministry of Education and Research 2010a, 2)	Basic skills: the basic skills – being able to express oneself orally and in writing, being able to read, numeracy, and being able to use digital tools – are both a prerequisite for developing academic knowledge and part of the academic competence in	The student can evaluate learning resources and reflect on didactic possibilities with the use of ICT (Ministry of Education and Research 2010c, 17, Ministry of Education and Research 2010d, 17) (our translation)		The student can evaluate different kinds of subject specific learning resources on the basis of given criteria with regards to pupils' learning outcome (Ministry of Education and Research 2010c, 30) (our translation)

(*Continued*)

Table 1. (*Continued*).

	National curriculum regulations	National guidelines – general provisions	National guidelines – pedagogy and pupil-related skills	National guidelines – Mathematics	National guidelines – Norwegian
		all subjects. Each subject is responsible for the students acquiring knowledge about how they can help the pupils develop their basic skills in the subject. Pedagogy and Pupil-related Skills is to make it possible for the students to acquire a theoretic superstructure related to basic skills as a prerequisite for working with these in different subjects (Ministry of Education and Research 2010b, 6)			
Social awareness	The candidate understands the social perspectives linked to developments within technology and media (safe use, protection of privacy, freedom of expression) and can help children and young people develop a reflective attitude to digital arenas (Ministry of Education and Research 2010a, 3)				

None of the knowledge types are identified in all curriculum documents. Pedagogical compatibility is the knowledge type that is emphasised in most of the documents, while social awareness is found in only one of the curriculum documents included, in the description of learning outcome for candidates of both streams in the national curriculum regulations.

Digital competence in the local curriculum documents

Teacher education institutions have developed their programme descriptions on the basis of the national curriculum documents. Therefore, some of the formulations presented in Table 1 are found in the general provisions of most of the 19 programme descriptions. There are, however, some institutions that have chosen not to include the formulations specified above, and some who have provided more thorough descriptions of the desired learning outcome for pre-service teachers with regards to technology proficiency, pedagogical compatibility and social awareness. In the following sections, examples from local curriculum documents will be presented.

Technology proficiency

There are rather few examples of technology proficiency found in the institutions' programme descriptions beyond what is specified in the national curriculum documents. There are, however, some institutions that emphasise the use of technology as a resource for student learning:

> Students should develop personal skills in using ICT and meet a broad repertoire of working methods in the education. They should communicate through various media and use ICT in an adequate manner on their way to digital competence. (Institution 1, our translation)

A similar statement is found in the general provisions of another institution: 'candidates should be able to master the use of digital systems through the production, presentation, searching and sharing of digital information' (Institution 9, our translation). In both examples, attention is drawn towards the development of personal ICT skills, focusing on how use of digital tools can contribute to developing technology proficiency. Further, development of personal digital skills is proposed as a means towards becoming a confident technology user both in the classroom and in society in general:

> Moreover, the education should contribute to developing students' digital skills, in order for them to be able to use ICT as teachers in a safe, familiar and creative way, and to be full participants in society. (Institution 9, our translation)

This sentence is related to development of both technology proficiency and pedagogical compatibility, and could therefore be placed in both categories. The first and the third clause of the sentence refers to the students' basic skills, his or her technology proficiency, while the middle clause may be related to the didactic digital competence the student requires as a teacher, his or her pedagogical compatibility. Together the three clauses of the sentence describe a competence needed in order to integrate digital tools successfully in the classroom. In order to help students acquire this competence, some institutions have chosen to provide introductory educational technology courses or methods courses in which technology is integrated. In line

with this, one institution (Institution 19) distinguishes itself clearly from the others with their thorough description of the technology course provided for all students. Use of digital tools is given as a compulsory course that should be taken during the first 2 years of study. Through working with a number of assignments, students are trained in using standard software as well as more specialised pedagogical resources such as interactive whiteboards and learning management systems. Thus, the responsibility for development of technology proficiency is primarily placed outside the individual subjects. Nonetheless, examples of technology proficiency can also be found in the subject descriptions for the other subjects included in the analysis. In the description of content, structure and educational methods in Pedagogy and Pupil-related Skills for students in both streams at the same institution, use of digital tools in terms of technology proficiency is emphasised:

> Use of digital tools, seminars, dialogue and guidance are common work methods. The training should raise students' consciousness of possibilities and limitations with the use of digital media. (Institution 19, our translation)

Related formulations can also be found for Norwegian and mathematics, all in connection with structure and educational methods. Similarly, at Institution 5, being able to use ICT as a personal tool through the course is emphasised as part of the learning process in the subject description for Norwegian for grades 1–7. Further, students are expected to 'acquire knowledge about use of ICT in primary school' (Institution 5, our translation). In the same way, Institution 9 highlights among other things the use of digital learning resources and digital reading strategies in Norwegian language learning as part of the course content in the second year of study. The same can be seen in subject descriptions for mathematics. Several of the institutions specify that digital tools should be used during the course, but only one institution embraces use of digital tools in terms of technology proficiency in the learning outcome; after completing the first level of mathematics at Institution 5, students are also expected to have knowledge about how to use digital tools both in the subject and as part of the training, and have 'knowledge of and experience with different learning resources, both digital and other, and be aware of possibilities and limitations of such resources' (Institution 5, our translation). Apart from this, however, use of digital tools in terms of technology proficiency is not emphasised as part of the learning outcome for mathematics.

Pedagogical compatibility

As shown in the previous section, there are few examples of technology proficiency in the institutions' programme descriptions when it comes to expected learning outcome. There is a tendency for institutions that emphasise technology proficiency to see this as a basis for developing pedagogical compatibility. The following excerpt is an example of this:

> A primary school teacher should ensure the pupils' development in the five basic skills: reading, writing, numeracy, digital skills and to express themselves orally. On the way there, students must work on their own skills through the mandatory and selected subjects. (Institution 1, ITE1–7, our translation)

This example illustrates use of technology throughout the teacher education programme with the intention to help students become confident in integrating digital

tools in their pedagogical practise. Another approach to understanding pedagogical compatibility is reflected in four local curriculum documents. Institution 16 defines digital competence as follows:

> Digital competence in teacher education involves developing a good educational and didactic ICT judgment; candidates will become digitally conscious and competent participants who are able to assess the appropriate use of digital tools in learning and teaching. (Institution 16, our translation)

Here we see an emphasis on didactical judgement and how digital competence can enable participation and enable future teachers to choose appropriate tools. The programme description from this institution does not, however, say anything about how this kind of competence should be acquired. Institution 10, on the other hand, gives the following description of how development of digital competence is attended to:

> As a teacher, one must be able to consider, initiate and lead the work with ICT and learning. Digital tools are used in the planning, implementation and evaluation of teaching assignments in the programme in the same manner as is expected of teachers in primary schools. A didactic understanding of how ICT can be used as support in learning situations should be developed. ICT-training is integrated into the various subject descriptions, and ICT is related to the work requirements and exams in subjects and practical training. Digital competence is concretised and established in a separate plan for digital literacy and also integrated into the subject descriptions. (Institution 10, our translation)

One of the teacher education institutions highlights having 'didactic competence in all subjects and being able to evaluate adequate use of digital tools' (Institution 5, our translation) as an important general competence learning outcome for students on grades 1–7. Use of digital tools is thus seen in relation with general didactic competence, and is not related to any specific discipline or subject area. In the subject specific descriptions on the other hand, there are examples of use of technology. Institution 9 expects students to work with 'development of pupils' reading skills with emphasis on comprehension and reading strategies in working with academic texts and textbook texts on paper and screen' (Institution 9, Norwegian 1–7, our translation). This draws on students' pedagogical compatibility in order to help pupils develop good reading strategies in digital arenas. Similar formulations can be found in the content descriptions of a few other institutions. It is, however, worth noticing that the formulations are found in the section describing educational methods, structure and form of instruction in the subject, and not reflected in the formulation of learning outcome after completing the subject. Similarly, the same can be seen in subject descriptions for mathematics and Pedagogy and Pupil-related Skills.

Social awareness

Knowledge of the organisational and social culture of school in relation to integration of technology is not emphasised in the programme descriptions of teacher education programmes, neither in the general descriptions nor in the subject specific programme descriptions. The only incidence of this found in the institutions' programme descriptions is the example identified in the national curriculum regulations.

Discussion and implications

The results indicate that although digital competence is emphasised as a basic skill for students at all levels, there is still little evidence of technology integration in curriculum documents for teacher education programmes. Use of digital tools does not seem to have a prominent position in the general programme descriptions or in subject specific descriptions. Moreover, the results of the analyses show that the use of digital tools is primarily mentioned in the curriculum documents in relation to structure and working methods for pre-service teachers and only infrequently found as part of the intended learning outcome.

Which knowledge areas of digital competence are addressed in national and local curriculum documents, and how?

Integration of technology across the curriculum is still highly limited. The analyses have not found great differences in how institutions emphasise the three knowledge areas that constitute digital competence. Nevertheless, there are some important issues concerning knowledge areas of digital competence that will be addressed.

First results indicate an emphasis on pedagogical compatibility compared to other knowledge areas of digital competence. This type of knowledge is in line with recommendations from research literature (Angeli and Valanides 2009; Chai et al. 2011). Second, the analysis reveals that technology does play a slightly stronger role in some subjects than in others. There are for instance more examples of technology proficiency found in the subject description of Norwegian and Pedagogy and Pupil-related Skills than in the subject descriptions for mathematics. On the other hand, subject specific variations are not similarly clear for pedagogical compatibility. Several examples of pedagogical compatibility are identified for all subjects included in the analysis, suggesting that this type of knowledge has been devoted equal attention across subjects. Thus, the results do not provide enough evidence to claim that some subjects have assumed more responsibility for integration of technology than others or to conclude that technology is more integrated in one subject than in another.

As suggested by Zhao et al. (2002), future teachers should be made aware of school realities in order to prepare them to integrate technology successfully in their teaching. The lack of examples of social awareness found in curriculum documents is therefore concerning. The findings suggest that teacher education programmes are not fully aware of their responsibility in this regard. There is also no evidence in the local curriculum documents to suggest that students encounter this kind of expertise during teaching practice. Knowing the current situation in schools in terms of missing infrastructure or technological support, pre-service teachers should be made aware of the social conditions and technological support that exists in schools (Martinovic and Zhang 2012). Teacher educators should therefore strive to integrate this knowledge area in the teacher education curricula.

Together the three knowledge areas of digital competence constitute a competence that embraces not only how to use technology and how to apply technology to specific content areas for teaching, but also an understanding of social aspects of school realities. Individually each of the three also stands for a different kind of knowledge that demands for different approaches in terms of teaching methods and strategies (Angeli and Valanides 2009). The chosen strategies for integration of technology in teacher training programmes may thus reflect what kind of knowledge is

emphasised by the individual institutions. A relevant question in this context is which content and delivery methods are best suited for preparing pre-service teachers to integrate technology in their future classrooms (Tondeur et al. 2011)? The results suggest that there are notable differences between the strategies institutions had chosen for integrating technology. While most institutions had chosen to look at integration of technology as a joint responsibility for all subjects, one institution also provided an educational technology course in order to give pre-service teachers a technical foundation for their pedagogical use of ICT. Through this course, students experienced using digital tools such as word processing, spreadsheets and presentation software. Technology proficiency can in this way be easily acquired, but in view of the fact that the content of the assignments are not related to any subject specific content, assignments appear disconnected from subject specific content.

As stated by Koehler and Punya (2008), teaching technology skills alone does little to help teachers develop a deeper knowledge of how to effectively integrate technology in classroom activities in order to improve student learning. Accordingly, the majority of these assignments are related to development of pre-service teachers' technology proficiency while only a minority can be associated with pedagogical compatibility and none of them are related to social awareness. According to the findings here, students are expected to build up necessary technology proficiency through working with assignments and participating in lectures, seminars and other learning arenas. Such an approach implicitly draws on students' ability to transfer their own experiences during teacher training to their future classrooms. In other words, it becomes the students' own responsibility to convert technology proficiency into pedagogical compatibility. Previous research indicates that isolated technical proficiency is not sufficient for providing new teaching opportunities (Haugerud 2011). More attention should therefore be directed towards development of pedagogical compatibility.

Conclusions

Results indicate that use of technology does not have a prominent position in the curriculum documents. Pedagogical compatibility is given slightly more attention than technology proficiency, but there are few intended learning outcomes for the integration of technology. This may reflect that being able to use and integrate digital tools successfully is not yet regarded as an important component of teachers' professional competence.

All of these findings imply that the implementation and integration of digital tools in teacher education is more complex, constrained and compromised than descriptions in the national curriculum would suggest. Digital competence is a complex competence that consists of a number of knowledge areas. It is not sufficient to teach students how to use technology. Future teachers also need to learn how this technology can be used in their teaching to facilitate new possibilities for teaching and learning to contribute to promoting new learning strategies. In order to educate teachers who are better prepared to integrate technology in their future classrooms, teacher education institutions need to develop an awareness of which areas of knowledge they integrate into their curricula, what the goal of this particular knowledge is and which strategies are best suited to help pre-service teachers acquire this knowledge. This article may contribute to increasing such awareness, while simultaneously providing a tool for clarifying the content of the concept 'Teachers' digital competence'.

Limitations of the study and directions for future research

Although the case in this study is Norway, we believe that our findings are relevant across borders due to the international call for answers to the questions addressed. However, programme descriptions primarily reflect the intentional situation rather than the actual use of digital tools within teaching and learning. It still remains unclear whether the lack of technology integration found at the formal curriculum level is also reflected on the *perceived*, *operational* and *experiential* curriculum levels (Goodlad, Klein, and Tye, 1979). Given that document analysis will not provide sufficient understanding of issues related to the other levels on which the curriculum is developed, representing the actual situation in teacher education, these issues call for a different approach. Therefore, it would be of interest to study how pre-service teachers and teacher educators perceive the emphasis on use of digital tools and development of digital competence in teacher education.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

Elen Instefjord is an assistant professor at Stord/Haugesund University College, Norway. She teaches a range of modules in a masters' programme in ICT in learning, and is currently working on her PhD in Educational Sciences at the Faculty of Arts and Education, University of Stavanger. In her PhD project, she focuses on digital competence in teacher education.

Elaine Munthe is Professor of Education and Dean of the Faculty of Arts and Education, University of Stavanger, Norway. She is currently Chair of 'Research and innovation in Education', a program within the Norwegian Research Council. Her research is mainly on teachers' work and teacher education.

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Article II

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PEER REVIEWED ARTICLE

Appropriation of Digital Competence in Teacher Education

Elen Instefjord
PhD-candidate, University of Stavanger / Assistant Professor, Stord/Haugesund University College, Norway
elen.instefjord@hsh.no

ABSTRACT

The aim of the article is to explore opportunities for appropriation of digital competence in teacher education. Digital competence is knowledge, skills and attitudes required in order to use technology critically and reflectively in the process of building new knowledge. According to Wertsch learning to use a cultural artefact is characterized by two processes: mastery and appropriation. The article reports from a case study of two teacher education institutions. Findings indicate that the same challenges are found in both institutions: the conflict between mastery and appropriation, and between personal and educational use of technology, and the resistance towards technology among some teacher educators. The results signify that in order to create opportunities for appropriation of digital competence and encourage use of technology as part of pre-service teachers' professional didactic competence, technology should be better integrated as pedagogical tools for teaching and learning in all subjects in the teacher education programmes.

Keywords

teacher education, technology, digital competence, appropriation

INTRODUCTION

Over the last two decades, considerable time and money have been invested in integration and use of technology at all levels of education, and a number of large reforms have swept through the Norwegian education system (Lund & Hauge, 2011). However, in spite of the investments and the ever increasing availability of technology in schools (Egeberg, Guðmundsdóttir, Hatlevik, Ottestad, Skaug, & Tømte, 2012), there still appears to be a gap between the technology available in classrooms and teachers' use of this technology for educational purposes (Kopcha, 2012; ten Brummelhuis & Kuiper, 2008; Petko, 2012; Zhao, Pugh, Sheldon, & Byers, 2002). Studies have revealed that many teachers do not integrate technology effectively into their classroom activities (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012; Harris,

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Mishra, & Koehler, 2009) and that minimal pedagogical change can be identified (Somekh, 2008).

Research has also indicated that pre-service teachers' experience with technology from teacher education programmes influences how they later choose to use technology in their teaching (Drent & Meelissen, 2008; Agyei & Voogt, 2011). Nevertheless, providing pre-service teachers with the necessary competence in order to integrate technology in their future classrooms remains a challenge for teacher education programmes worldwide. Teacher education programmes are commonly criticized for their failure to provide pre-service teachers with the necessary experiences of how to utilize educational technologies in a teaching practice (Chien, Chang, Yeh, & Chang, 2012) and for not focusing sufficiently on developing pre-service teachers' digital competence (Wilhelmsen, Ørnes, Kristiansen, & Breivik, 2009). This is confirmed in a recent report from the Nordic Institute for Studies in Innovation, Research and Education, indicating that development of professional digital competence is consistently weakly rooted in the management of teacher education programmes, and that most programmes lack a coherent approach to the development of such skills (Tømte, Kårstein, & Olsen, 2013). An analysis of the curriculum for teacher education in Norway indicates that digital competence is integrated to a limited extent in the curriculum documents and that there are variations between the different institutions in terms of technology integration (Instefjord & Munthe, 2014). Thus, there is a need to investigate further how teacher education programmes prepare pre-service teachers for using technology in their future classrooms. Against this backdrop we ask: *What opportunities for appropriation of digital competence does teacher education offer?* In short, digital competence is knowledge, skills and attitudes required in order to use technology critically and reflectively in the process of building new knowledge. The focus of this article is directed towards teacher educators' and pre-service teachers' perceptions and descriptions of digital competence and how technology is being used and appropriated by teacher educators and pre-service teachers.

THEORETICAL PERSPECTIVE

In the Knowledge Promotion Reform, a curriculum reform for primary- and secondary education that was introduced in Norway in 2006, the ability to use digital tools was emphasized as one of five basic skills. This was recently followed up by a framework for basic skills, developed by the Norwegian Directorate for Education and Training in 2012, which highlights that developing digital skills means "learning to use digital tools, media and resources and learn to make use of them to acquire subject-related knowledge and express one's own competence" (Norwegian Directorate for Education and Training, 2012, p. 12). Being able to use digital tools is now seen as a central competence at all levels of society, and a number of attempts have been made towards developing a common understanding of the notion *digital competence*. In a

report from the European Commission, Ferrari (Ferrari, 2012) proposes the following definition:

> Digital competence is the set of knowledge, skills, attitudes (thus including abilities, strategies, values and awareness) that are required when using ICT and digital media to perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively for work, leisure, participation, learning, socialising, consuming, and empowerment (Ferrari, 2012, pp. 3–4)

The definition illustrates the complexity of the concept by indicating that being digitally competent involves far more than having technical skills. Technical skills and the ability to use specific tools are only two of many aspects of digital competence. In this article digital competence refers to the wide range of competencies associated with the use of digital technologies. These technologies include hardware and software used for educational as well as social and entertainment purposes, both in school and at home. The competence needed to make use of these technologies embraces technical, cognitive and social-emotional perspectives of learning with digital technologies (Ng, 2012). Preparing pre-service teachers for their future classrooms requires teacher education programmes that help students develop an understanding of this complexity, both in terms of technologies and competencies. However, digital competence for teachers is also about being able to use technology to promote student learning and contribute to building knowledge in all the ways the definition calls for. This requires a special expertise that differs from digital competence of other professional groups (Krumsvik, 2011). The specific focus in this article is therefore directed towards the development of digital competence as a tool for teaching and learning.

Learning is seen in light of Somekh's (2008) understanding of learning as a situated process being mediated by the context of the classroom, school and larger society. The concept of mediation implies that individual's interaction with objects in the world is mediated by cultural artefacts: signs, symbols and tools. By using various physical and intellectual tools, we are able to solve problems and master social situations in ways that would not have been possible without the support of cultural artefacts. Artefacts carry with them a history of use and are altered, shaped and transformed when employed in activities (Säljö, 2000). In the process of learning how to use artefacts, Wertsch distinguishes between the *mastery* of a cultural artefact and the *appropriation* of a cultural artefact. The first refers to knowing *how to* use an artefact, while the latter refers to "the process of taking something that belongs to others and make it one's own" (Wertsch, 1998, p. 53). If we see learning and development as mastery and appropriation of cultural artefacts, these processes stand out as a sophisticated process of coordination between humans and cultural artefacts (Säljö, 2006). Learning begins with an initial contact with something that is not familiar to us. At this stage of the learning process we begin to try out a new

artefact and start to investigate the different aspects of how the artefact mediates, and we may require help from others who are more familiar with the artefact. In this way we meet cultural artefacts in specific contexts and may begin to see them as resources for particular types of activities. As we spend more time getting to know the artefact, we learn new ways to use it and we discover new functions that we did not recognize in the beginning. Through these processes we learn to master the artefact in different contexts and it becomes so natural for us to use it that it will eventually be a part of our identity; it becomes appropriated and we will no longer need help from others.

Nevertheless, cultural artefacts are not always easily appropriated, and often a cultural artefact is mastered but not appropriated by the learner. Seen in light of Ferrari's (2012) definition this may mean that aspects of digital competence, such as being able to use technology to communicate, could be mastered in a particular context such as for socializing with family and friends, but not appropriated by the learner to such an extent that he or she would choose to use it in an educational context to create and share content and build knowledge creatively. There may also be situations of appropriation without mastery, where both interest and motivation are strong, but understanding of how to use the cultural artefact is still lacking or unsophisticated (Polman, 2006). Thus, appropriation without mastery refers to "coming to value a practice, but not yet having the competency to carry it off" (Laffey, 2004, p. 377).

According to Wertsch, an important aspect of appropriation is that it always involves some sort of resistance: "In such instances of mediated action, the agent may use a cultural tool but does so with a feeling of conflict or resistance" (Wertsch, 1998, p. 56). In operation, the cultural tool is not part of their identity and they may therefore choose to use it only in situations that demand compliance.

DESIGN AND METHODS

Selection

The study was designed as a multiple-case study (Yin, 2009) with two cases. The cases were selected on the basis of an analysis of programme descriptions for primary and lower secondary teacher education programmes for years 1–7 and 5–10, respectively, from all teacher education institutions in Norway. In the programme description from the first institution no examples of technology integration were identified, while the second demonstrated multiple examples of technology integration. Thus, the cases illustrate potentially contrasting situations in terms of emphasis on use of technology. The purpose of the study was to explore further the differences found at the curriculum level in order to gain a deeper understanding of how the use of technology in teacher education contributes to pre-service teachers' appropriation of digital competence.

Recruitment of teacher educators took place in three steps. First, written information about the project was sent to the Dean of each of the institutions in November 2011, inviting teachers to take part in the study. The Deans then forwarded the information to a selection of teachers. Thirdly, the researcher contacted these teachers and made arrangements directly with those who were willing to participate. A total of nine teacher educators agreed to participate in the study. Four teacher educators were female and five male. They taught a variety of subjects: Norwegian (2); mathematics (1); Pedagogy and Pupil-related Skills (4); Educational technology (1); and Physical Education (1).

In order to get in touch with pre-service teachers and simultaneously gain some informal indications of how technology was used, the researcher participated in lectures at both institutions. Two full days of lectures were attended in each of the institutions together with pre-service teachers in their first and second year of teacher training during April 2012. In line with ethical standards for research, all pre-service teachers who attended these lectures received oral and written information about the purpose of the visit, and they were asked to indicate their willingness to participate in focus group interviews. A total of 14 students volunteered to participate.

Data collection

Data was collected in April 2012 through individual interviews with teacher educators and focus group interviews with pre-service teachers. Both types of interviews were conducted as semi-structured interviews (Kvale & Brinkmann, 2009) and were fully recorded. Teacher educators were asked about their perception of what constitutes the notion of *digital competence* and what they believed a teacher in their subject needed to know in order to be digitally competent. They were also asked about how and how much they used technology in their own teaching and how they would rate their own level of digital competence. The interviews lasted between 32 and 91 minutes. All interviews were conducted on the basis of the same semi-structured interview guide and thus the time spent on each interview was controlled by the interviewees.

Focus group interviews were used to collect data from pre-service teachers. While group interviews are ideal for gathering many opinions from individuals within a group, focus group interviews are interactive and are particularly useful for understanding the collective perspective (Gibbs, 2012). Two focus group interviews were conducted in each of the cases. Two groups (one in each case) consisted of only two students, while the remaining two groups consisted of respectively six and four students. Nearly the same interview guide that was used in the individual interviews with teacher educators was used for the focus group interviews. However, in line with recommendations for moderation of focus group discussions (Gibbs, 2012), not all questions were covered and new areas of discussion were included as they arose from the group interaction. The focus group interviews lasted between 35 and 72 minutes.

Data analysis and presentation

Interviews were fully transcribed in HyperTranscribe and analysed in HyperResearch. Each interview was analysed by closely reading the transcripts several times. During the first reading, an overview of the data was achieved and broad categories focusing on initial patterns in the interviews were identified (Miles & Huberman, 1994). In the second reading, specific words and paragraphs that captured specific themes from the interview guide were highlighted. As a result, three main categories were identified: *self-perceived digital competence level*, *use of technology for educational purposes,* and *reflection on digital competence for teachers.* Each interview was then recoded in light of these categories. In the next step of the analysis data from each case was assembled as a set and a descriptive case report was written for each case. These case reports are included in the findings section. While examples of comments from the individual interviews are shown in the presentation, the data from the focus group interviews are presented without quotations from individuals. This is done to underline the collective perspective as the unit of analysis (Gibbs, 2012).

In order to facilitate a cross-case analysis, an analytic approach based on the theoretical perspective presented earlier was developed. Wertsch (1998) argues that learning to use a cultural artefact is characterized by two processes: *mastery* and *appropriation*. These aspects of the learning process have been used to frame the discussion in this article with the purpose of understanding how digital competence and teacher identity develop in interaction with one another.

RESULTS

Results from each case are presented separately. Teacher educators have been given fictitious names, while pre-service teachers are primarily referred to as students. All quotations have been translated from Norwegian by the researcher.

Case 1

Teacher educators Sarah, Chris, Ben and Karen work at a university college located in the eastern part of the country. Substantial investments and efforts have been made towards integration of technology, including providing laptops for all students in the teacher education programmes for primary and lower secondary education. The institution also provides a support system for students and faculty. The four teacher educators interviewed in this case represent three different subjects (Pedagogy and Pupil-related Skills (Sarah and Ben), Educational technology (Chris), and Mathematics (Karen)).

Chris and Ben rated their own level of digital competence and their interest in technology as being above average. They both had experience from different

professions before they joined the university college. Ben did not have any formal technology training, but had previously run his own ICT-company and had worked as an ICT coordinator in an elementary school. Chris, a teacher in Educational technology, was trained as a computer technician. He was the main teacher in an introductory course on educational technology and had strong opinions concerning the importance of integrating technology in teacher education. The two other teacher educators in case one, Sarah and Karen, both rated their digital competence as about average. Neither of them had any formal training in the use of technology, but they both felt quite confident about using technology. Karen, a Mathematics teacher, said:

> Some of my colleagues are a lot better than me, I am, it's not the area that I know most about, but I do what I need to master it with my students" (Case1: Karen).

Karen used technology regularly in lessons and had a clear educational rationale for her use of technology. When required to reflect on the technology she used in class, she commented:

> We use Excel, in several different areas, and then students learn to use Excel while they also see what this can be used for in school, and we also discuss what is good and what is not good about using spreadsheets. And we use GeoGebra, a programme that is very good for solving equations and working with functions, and for showing things in geometry. And then we have a discussion about why it is ok to use it in teaching and which benefits it provides pupils (Case1: Karen).

Sarah was very enthusiastic about technology. She had recently introduced iPads as a new tool in Pedagogy- and pupil related skills, and she was utterly excited about all the new possibilities this tool could provide. Although her institution did not encourage it, she had also chosen to use Facebook both for communicating with her students and for educational purposes. According to her, all but one of her students were already on Facebook, and she therefore found Facebook to be a more efficient platform for communication. However, when being asked about what criteria guided her selection of apps or other learning resources, Sarah acknowledged that she did not always have an educational rationale for her choices.

All teacher educators reported that they used digital tools both for preparations, in the office, at home, and in the classroom. They all used PowerPoint presentations regularly and most of them said they used PowerPoint in all lectures. Ben, however, believed that his students did not learn enough from looking at PowerPoint presentations and had therefore chosen to use other methods of delivery:

> I use digital tools, this is kind of a dilemma, because I use them a lot. But I use them a little differently than others. We try to provide exemplary teach-

> ing, we hope we get there, but we cannot, because students have a certain expectation that we will have slides and have prints and have things they should write down, the way it has always been. And in a way I understand that, but we know that they forget the pictures very quickly. So I thought, what do we do about that, how do we give them experience with other methods than highlighted sentences on a screen? So, I thought I would do something different. And I chose to use illustrations instead. So I present an awful lot of pictures, animations, movies, stuff like that, and besides from that I am analogue, so I draw, I use my own drawings and scanner, and I simply draw on the blackboard (Case1: Ben).

When being asked about what a teacher needed to be able to do or know in order to be digitally competent, a number of the teacher educators mentioned being able to use PowerPoint and social media. One teacher educator noted:

> They should at least be able to use PowerPoint or Prezi, and then they should master the use of e-mail. I think social media are also important. I don't master Twitter, I don't know why, but I think they should at least master one of them, either Facebook or Twitter (Case1: Sarah).

The interviews also revealed that all the teacher educators saw use of interactive whiteboards as an important aspect of teachers' digital competence. However, Chris, the educational technology teacher, was the only one who knew how to use an interactive whiteboard, while Ben, Karen and Sarah all expressed concerns about their own lack of competence in this area. In Karen's words:

> I haven't learned to use a SMART Board well enough to use it in my teaching. I have taken a course, so I do know what it is about, and I'm planning to attend a course here on the 15th of May, but I have had so little time I haven't had time to learn it properly (Case1: Karen).

This comment aligns with the feedback students provided in the focus group discussions. The six students in the first group were second year students on the 1–7 programme, ranging between 20 and 35 years of age. On the whole, they rated their own level of digital competence as being fairly high. However, the students were clearly split on their views about how much they had learned about use of digital tools during the programme. Most of the students in the group were of the opinion that their digital competence had been acquired before they started the programme. One student was more positive than the rest. She had a particular interest in technology and rated her own digital competence level as being very high. This student said that the programme had contributed to increasing her competence level. The discussion revealed that the institution offered a compulsory, introductory course in educational technology during the first year of the programme. However, a number of practical problems were pointed out about the introductory course. Students felt that the course was too detached from the rest of the subjects and that even though they

had worked with the mandatory requirements during the first year, the competence acquired during the course was already lost. The activities did not enable them to build connections between what they learned in the course and what they needed in their future teaching. Comments also suggested that they were critical as to how the technology course was organized. The course was taught in a large lecture theatre with many students present, and the lecturer was either the educational technology teacher or presenters representing external companies such as SMART Technologies. According to the students there were too many students and too little time, a situation that made it difficult for them to receive necessary support if they encountered any technical problems. Instead of explaining how to solve technical problems, assistants would do the tasks for them. Due to the way this course was organized they did not have any practical experience with, for instance, the use of interactive whiteboards, and they were therefore critical to the overall learning outcome of the course.

The two students who took part in the second focus group discussion were generally more positive about the introductory course. They were first year students on the 5–10 programme and the interview was conducted immediately after they had attended a full day's course in the use of a SMART Board. They said they found the course interesting and that they had gained new competence through attending the course. However, they noted that they would have learned more if the course provided an opportunity to experiment with the board instead of only watching the presenter. Although they both perceived their own level of digital competence to be more or less average, none of them had any previous experience with using an interactive whiteboard.

Case 2

Teacher educators Tom, Peter, Lisa, David and Anna teach in the second teacher education institution located in the western part of the country. The five teacher educators represent three different subjects (Norwegian (Tom and Peter), Pedagogy and Pupil-related Skills (David and Anna), and Physical Education (Lisa)).

Tom and Lisa both rated their own digital competence level as average, while David, a Pedagogy and Pupil-related Skills teacher, and Peter, a Norwegian teacher, rated their own digital competence as fairly high. They had both used technology for many years, both in personal situations and with their students, and one of them had participated in national projects related to the use of technology in education. In the words of Peter:

> I'm not a technician myself, but I've always been interested in how to use it in a rational and meaningful way, but also in teacher training, including for example related to, uh, everything from digital portfolios […] to the use of digital whiteboards (Case2: Peter).

However, the last teacher educator in case two, Anna, a Pedagogy and Pupil-related Skills teacher, expressed serious concerns about both her own level of competence and the general level of digital competence at her university college:

> No, but the [digital] competence is in general too low, I think, but I think I'm among the very worst, most of the others are better than me (Case2: Anna).

Comments also suggested that several of the teacher educators had attended theoretical introductory courses in how to use an interactive whiteboard but had no practical experience with the board. For this reason they did not feel confident using this technology in the classroom. One teacher educator said: "I have taken a course, but I have never used it. I don't know how to use it" (Case2: Tom).

Teacher educators were asked to explain how they understood the notion *digital competence* and what they thought a teacher needed to know in order to be digitally competent in their subject. Several of the teacher educators indicated that this was a difficult question. One of them said:

> If you want me to define it that could be a little bit difficult because I haven't even read the course book about digital competence. But I believe it means that you should be able to use technology and manage information and communicate through it. […] No, but all these new pages with Twitter, and all these places where children can go in and create their own pages, and how dangerous that is, that is something the teacher should talk about. And the ethical perspective and how girls can be offended through Facebook and all these new things. That is something I would have spent time on if I were a young teacher today. And that is what I tell my students (Case2: Anna)

Tom argued that he did not see any big difference between the digital competence needed in his subject, Norwegian, and other subjects:

> Yes, no, but I doubt that the subject Norwegian is so special in this regard. Digital competence in Norwegian, is that any different from digital competence in religion or social science? But perhaps it's a little different in mathematics and physics where they need models and figures and those sorts of things (Case2: Tom).

Peter, on the other hand, had a clear opinion of what teachers needed to know in order to be digitally competent. According to him, teachers needed basic competence in standard software, social media, learning platform and internet, as well as a strong didactic competence:

> […] they should have a minimum of awareness, and I believe they do, although they do not always manage to use it, but awareness of what is

> good ICT didactics, that is how you can use ICT in a didactic manner. When they use PowerPoint, as most teachers do, what is a good PowerPoint, how can you use it properly? It can be used in many ways, depending on what the purpose of the PowerPoint is (Case2: Peter).

As was found in the interviews in case one, all teacher educators in the second case reported that they used technology for preparations and in the classroom. Except for Lisa, the Physical Education teacher, they all reported that they used PowerPoint in nearly every lecture. Tom was concerned that the way PowerPoint was used in the teacher education programmes did not serve as a good example of how their students should use technology in the classroom. He was worried about what he expressed as lack of connection between the instructional strategies used by the teacher educators, and the relationship between the practices for which the students are prepared:

> It feels like I sit by that machine nearly all day. And that leads to, when I finish work and go home at night, I do not really want to turn on my computer in the evening. I simply think I use it so much, but I use it less in teaching, but maybe, yes, no, I will not say I use it too much, but too badly I'd rather say. […] You know, I think that when our students get out in the classroom during practical training they will soon understand that they cannot follow our example and give only one way lessons like we do here (Case 2: Tom).

He followed up this comment by saying that he wished the students would acquire more practical skills for use in school. Comments in the focus groups indicated that this concern was also shared by the students. The students in the first focus group were first year students at the 1–7 programme, between 20 and 25 years old (two male, two female). They rated their own level of digital competence as being average for their age group. They mastered standard software, were able to search for information on the Internet, and used social media for personal purposes. The discussion revealed that students felt attending lectures at the teacher education programme had not given them ideas for future teaching. In the preceding lecture they presented a multimodal text they had created by themselves. Nevertheless, when asked about what kind of digital tools they had encountered in the teacher training programme, they said that they had not learned anything new about digital tools, and that digital tools were not used in the programme *at all*. The interviewer found this information surprising and the students were therefore asked to elaborate. The students then explained that they had "only" used PowerPoint, YouTube, Internet and Word. According to them, they did not see these tools as technology worth mentioning; these tools were simply tools that they used more or less every day as learners. The discussion also revealed that they were tired of PowerPoint being used in all lectures, and that, although they had enjoyed working with the assignment they had just presented, they did not see much value in accomplishing it.

The two students (one male, one female) in the second group were students on the 5–10 programme and they were both 22 years old. These students shared the teacher educators' view on interactive whiteboards. Comments indicated that the students had been introduced to interactive whiteboards during practical training and they were clear that being able to use an interactive whiteboard to enhance student learning was an important aspect of teachers' digital competence. However, they had little or no experience with interactive whiteboards from the teacher training, and were critical about the lack of training in this area.

DISCUSSION

This study investigated opportunities for appropriation of digital competence in two different teacher education institutions. Before we discuss the opportunities for learning in terms of Wertsch's distinction between mastery and appropriation we should once again direct our attention towards Ferrari's (Ferrari, 2012) definition of digital competence. In short, digital competence is the knowledge, skills and attitudes required to be able to use technology reflectively for a number of different activities in a number of different contexts in life. For a teacher, digital competence is also about having the competence needed in order to help others develop a digital competence in line with all the aspects included in Ferrari's definition. Such a competence demands awareness around the use of technology that goes far beyond technical skills. According to Haugerud (2011), what has to be appropriated in order for preservice teachers to use technology effectively as teachers, is far more than use of technology in isolation or in personal situations.

However, when asked about their level of digital competence, several of the teacher educators in both cases focus primarily on the technical aspects of their competence when they describe their own competence level. Although the two cases were initially chosen because of their potentially contrasting situation in terms of technology integration, the results do not unveil any major differences in terms of teacher educators rating their digital competence. In both cases most of the teacher educators rate their own level of competence and extent of technology use as being around average – some a little higher, some a little lower, but in general nearly similar to everyone else's. Moreover, they use their technical skills as a measure of their own digital competence. Seen in light of Wertsch's (1998) perspective on learning as mastery and appropriation of cultural artefacts, teacher educator's descriptions of their own digital competence may be seen as indicators of mastery without appropriation. This can, for instance, be seen in Tom's description of his own use of PowerPoint. He masters the technical aspects of the software itself, but he is not happy with neither his own use of it in the classroom, nor does he see any potential educational benefits. In case one, Ben's description of how he uses technology in the classroom may serve as another example of mastery without appropriation. Ben uses the cultural artefact with a strong feeling of conflict or resistance and does

not view the artefact as something that belongs to him or his teaching practice. When the level of resistance grows sufficiently strong he may refuse to use the cultural artefact all together (Wertsch, 1998). In Ben's example this is nearly the case, – he still uses technology, but he admits that he prefers to write and draw on the board instead.

If we rate our own competence as very high, there is little need for competence enhancement. Ben's resistance towards the use of technology can be seen as an example in this regard. Although Ben has not appropriated the use of technology as seen from a teaching perspective, he masters the technology and therefore he is not interested in learning more about how to use the technology in a teaching context. An important aspect of appropriation of a technology as a cultural artefact is therefore to find ways to overcome this resistance (Säljö, 2006).

Karen can be seen as an example of a teacher educator who has appropriated digital competence. Although she is relatively humble when she talks about her own digital competence level, her answers in the interview indicate that, with the exception of interactive whiteboards, she masters the necessary artefacts both on a personal and didactic level. She demonstrates a high level of pedagogical reflection concerning uses of technology for educational purposes and makes it clear that she only uses technology when she finds this to be the tool best suited in order to accomplish the desired learning outcome. A similar example is found in case two where Peter reflects on what digital competence is for a teacher. He knows how to use the technology and can make use of it in a number of different contexts.

The interviews also revealed examples of what seems to be appropriation without mastery, for instance when Anna reflects on what a teacher should know in order to be digitally competent. She evidently sees the value of social media in education without being able to use them herself. Anna knows that her own digital competence is lower than most of her colleagues and students, and, although her understanding is lacking, she is interested and motivated, and spends time discussing the issues with her students. This appropriation of an activity may serve as motivation for trying to develop the necessary competence required for the activity (Haugerud, 2011). Another example of appropriation without mastery is related to the use of interactive whiteboards. In both cases teacher educators and pre-service students see the use of whiteboards as an important aspect of teachers' digital competence, but they do not master the artefact. Although these teacher educators lack the competency to use the relevant technologies, it can be positive that they have come to value the technologies. However, unless they also actively seek to develop the necessary mastery, there is no guarantee that this may serve as what Polman (2006) refers to as preparation for future learning.

For pre-service teachers' opportunities for appropriation of digital competence, the examples of mastery without appropriation and appropriation without mastery are discouraging. The example from case two, where pre-service

teachers initially claim not to have used any digital tools in the teacher education programme, and later mention a number of examples of digital technologies they have used, indicates that pre-service teachers and teacher educators have different opinions on what it means to use digital tools in the classroom. While students seem to have appropriated use of technology to such an extent that it has become part of their identity as learners (Wertsch, 1998), teacher educators still tend to see technology as an add-on that does not necessarily blend with their teaching strategies. They use PowerPoint to structure their lectures, but there are few pedagogical justifications for their use. The differing opinions found, underlines the need for a common language that enables teachers to reflect on the use of technology to enhance learning. In order encourage use of technology as part of pre-service teachers' professional didactic competence, teacher educators must acknowledge the complex relationship between mastery and appropriation on the one hand and personal and professional use of technology on the other hand. Such a competence cannot be developed through independent introductory courses in the use of technology as that discussed in case one, but should be intertwined with the context of the classroom, school and larger society.

Mastery without appropriation is also found among pre-service teachers. An example of this can be found in case two, where students talk about the multimodal texts they presented earlier the same day, or in case one, where the students talk about the introductory course they have attended. They have used technology to complete the task, but they do not see the technological accomplishment as personally valuable (Laffey, 2004). On the other hand, seen in light of Säljö's (2006) perspective on appropriation as a process of coordination between learner and artefact, the initial contact with new technology that such courses can offer should not be underestimated as a starting point for the learning process. In this way the introductory course may serve as a toolbox for the pre-service teachers, with a variety of tools that can be pulled out in different situations. However, all cultural artefacts carry with them a history of use and are themselves altered, shaped and transformed by the activity, in which they are used (Säljö, 2000). If pre-service teachers continue to use the artefacts after the initial encounter, they may learn to use them in other contexts than the one in which the artefact was originally introduced. But this process requires time and assistance from someone who is more familiar with the artefact in order for pre-service teachers to appropriate the artefact sufficiently to transfer what they have learned in a teacher education context to their future job as a teacher.

In this connection, the fact that most of the teacher educators and pre-service teachers in both cases rate their own digital competence as similar to everyone else's may weaken the opportunities for appropriation of digital competence among pre-service teachers. If we see learning as a process of coordination and collaboration between learners and cultural artefacts, students must interact with someone who has a higher level of competence in order for learning to take place (Säljö, 2000).

Limitations

As a final point it is important to acknowledge the limitations of the study. One of these limitations is related to the nature of the data collected. Focus group interviews are useful for exploring ideas and interpretive validity (Johnson & Turner, 2003). Furthermore, focus group interviews are particularly useful for studying social interaction as a means of producing a more complete understanding of the issues discussed (Halkier, 2010; Gibbs, 2012). On the other hand, the possibility of the discussion being dominated by one or two students must be taken into consideration. Although the task of the moderator in a focus group discussion is to present the issues in question and create an open atmosphere where the participants are comfortable expressing their attitudes, students may be influenced by the more dominant participants in the group and thus be less inclined to present their personal opinions (Kvale & Brinkmann, 2009; Johnson & Turner, 2003; Gibbs, 2012). Moreover, both pre-service teachers participating in the focus groups and teacher educators were volunteers and thus their views on the issues discussed may not represent the full range of views.

A second limitation that should be addressed is the relatively small number of participants in the study. It is difficult to determine whether the same results could be identified across a larger group of teachers or in different institutions. However, the purpose of a case study is not to generalize across populations but to contribute to expand on or generalise theories by studying individual, group or organizational phenomena in the context of which they occur (Yin, 2009). This is what Yin refers to as *analytic generalisation* (Yin, 2009, s. 15). A second kind of generalization within case study research is *naturalistic generalisation* (Melrose, 2009; Stake, 1995). The purpose of naturalistic generalisation is not for researchers to present conclusions that can be transferred to a large population, but to invite readers to reflect on how ideas from the depictions presented may be applicable to their own situations (Melrose, 2009). In the current study, teacher educators are invited to translate the cases into their own day-to-day experiences with integration of technology in their classroom.

Finally, the question of reliability should be mentioned. While reliability in quantitative research depends on instrument construction, reliability or credibility, qualitative research relies largely on the skills of the researcher (Miles & Huberman, 1994). All analyses in this study have been done by the same person, something that may influence the reliability of the results. However, in order to improve reliability and reduce the potential bias of one person doing all the analyses, excerpts from the interviews were discussed with a second researcher.

CONCLUSION

Together the two cases highlight some important challenges regarding the appropriation of digital competence in teacher education. The stories presented

in this article suggest that the same challenges are found in both cases; the conflict between mastery and appropriation and between personal and educational use of technology, and the resistance towards technology among some teacher educators. This resistance may to some degree explain the gap between pre-service teachers' and teacher educators' personal use of technology and their competence in how to make use of technology in a learning context. In order to create opportunities for digital competence and teacher identity to develop in interaction with one another, it is therefore necessary to find ways to overcome this resistance. This can only be done by integrating technology even more as a pedagogical tool for teaching and learning in all subjects in the teacher education programmes.

Pre-service teachers who start their first year of teacher training autumn 2014 will not graduate until 2018. By the time they enter the classroom as teachers, the technical aspects of their digital competence in terms of mastery of digital tools may already be out-dated. Focus should therefore be directed away from mastery of tools themselves and towards appropriation of a digital competence that embraces awareness of how technology can be used critically and reflectively in the process of building new knowledge.

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Article III

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Appendices

List of appendices

Norsk samfunnsvitenskapelig datatjeneste AS
NORWEGIAN SOCIAL SCIENCE DATA SERVICES

Harald Hårfagres gate 29
N-5007 Bergen
Norway
Tel: +47-55 58 21 17
Fax: +47-55 58 96 50
nsd@nsd.uib.no
www.nsd.uib.no
Org.nr. 985 321 884

Elen Instefjord
Avdeling for lærerutdanning og kulturfag
Høgskolen Stord/Haugesund
Klingenbergvegen 8
5414 STORD

Vår dato: 24.10.2011 Vår ref: 28185 / 3 / LMR Deres dato: Deres ref:

KVITTERING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 27.09.2011. Meldingen gjelder prosjektet:

28185	*Digital Tools in Teacher Education – Basic Skills for Future Teachers*
Behandlingsansvarlig	*Høgskolen Stord/Haugesund, ved institusjonens øverste leder*
Daglig ansvarlig	*Elen Instefjord*

Personvernombudet har vurdert prosjektet og finner at behandlingen av personopplysninger er meldepliktig i henhold til personopplysningsloven § 31. Behandlingen tilfredsstiller kravene i personopplysningsloven.

Personvernombudets vurdering forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, eventuelle kommentarer samt personopplysningsloven/-helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, http://www.nsd.uib.no/personvern/forsk_stud/skjema.html. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, http://www.nsd.uib.no/personvern/prosjektoversikt.jsp.

Personvernombudet vil ved prosjektets avslutning, 31.07.2014, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen

Vigdis Namtvedt Kvalheim Linn-Merethe Rød

Kontaktperson: Linn-Merethe Rød tlf: 55 58 89 11
Vedlegg: Prosjektvurdering

Personvernombudet for forskning

Prosjektvurdering - Kommentar

Prosjektnr: 28185

Utvalget består av studenter og ansatte ved to lærerutdanningsinstitusjoner i Norge, totalt 36 personer. Data samles inn via personlig intervju med lærerne, gruppeintervju med studentene samt ved videoobservasjon i undervisningstimer.

Førstegangskontakt skjer via dekan/rektor ved de to lærestedene. Informasjon om prosjektet til studenter og ansatte vil bli gitt av prosjektleder ved personlig fremmøte på lærestedene. Det innhentes skriftlig samtykke til intervju og videoobservasjon. Ombudet finner informasjonsskrivene vedlagt meldeskjemaet tilfredsstillende.

Prosjektet skal avsluttes sommeren 2014 og innsamlede opplysninger skal da anonymiseres og lyd/videoopptak slettes. Anonymisering innebærer at direkte personidentifiserende opplysninger som navn/navneliste slettes, og at indirekte personidentifiserende opplysninger (sammenstilling av bakgrunnsopplysninger som f.eks. yrke, alder, kjønn) fjernes eller endres.

Universitetet
i Stavanger

Følgegruppen for
lærerutdanningsreformen

ERKLÆRING OM VILKÅR FOR BRUK AV DATA

"Jeg erklærer herved at

- **det kun er undertegnede som skal ha tilgang til data innsamlet fra Følgegruppen, og at datafilen ikke videreformidles til andre uten samtykke fra Følgegruppen**
- **data skal kun benyttes til egen forskning om IKT i lærerutdanningene"**

Stord (sted), den 11/4-11 (dato)

Glenn Ivskefjord

(Signatur)

Appendix 3: Information letter, institution/Dean

Elen Instefjord

Høgskolen Stord/Haugesund,
Klingenbergvegen 8,
5414 Stord
Telefon: 53 49 15 12

Høgskolen [navn]
v/ dekan [navn]

[Adresse]

Forespørsel om deltakelse i forskningsprosjekt

I forbindelse med min phd ved Universitet i Stavanger gjennomfører jeg et prosjekt som handler om hvordan arbeid med digitale verktøy blir ivaretatt i de nye grunnskolelærerutdanningene. Målet med prosjektet er å bidra til økt kunnskap om hvordan de ulike lærerutdanningsinstitusjonene arbeider med digitale verktøy og å fremskaffe gode eksempler på bruk av digitale verktøy i opplæringen av nye lærere.

I den forbindelse vil jeg svært gjerne besøke deres høgskole for å få kjennskap til hvordan deres lærerstudenter og lærere arbeider med digitale verktøy. For å finne ut av dette, ønsker jeg å intervjue 10-15 lærerstudenter og 3-5 lærere. Jeg vil gjennomføre fokusgruppeintervju med studenter og individuelle dybdeintervju med lærere. Intervjuene vil ta omkring en time, og vil bli tatt opp på lydbånd. I tillegg ønsker jeg å delta i noen undervisningstimer ved høgskolen og få anledning til å observere hvordan lærere og lærerstudenter arbeider med digitale verktøy i studiehverdagen. Jeg vil ikke komme uanmeldt inn i undervisningen, men ønsker at lærerne som sier seg villige til å delta i min undersøkelse selv velger ut et par timer hvor det passer for dem at jeg er til stede. I forbindelse med deltakelse i disse timene vil jeg benytte videokamera og ta notater underveis.

Det er frivillig å delta i prosjektet, og studenter og lærere kan på hvilket som helst tidspunkt trekke seg uten å måtte begrunne dette nærmere. Opplysningene vil bli behandlet konfidensielt, og ingen enkeltpersoner vil kunne gjenkjennes i den ferdige oppgaven. Prosjektet forventes å være avsluttet til sommeren 2014. Opplysningene anonymiseres og opptakene slettes når prosjektet er avsluttet. Prosjektet er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste A/S.

Jeg vil kontakte dere per telefon i løpet av desember 2011 for å høre om det er i orden at jeg besøker deres høgskole for å foreta intervju/observasjon blant noen av deres lærerstudenter og lærere. Dersom dere er villige til å delta kan vi da også avtale tidspunkt for når besøket kan gjennomføres, og hvilke lærere jeg kan kontakte. Hvis det er noe dere lurer på må dere gjerne ringe meg på 53 49 15 12, eller sende en e-post til elen.instefjord@hsh.no. Dere kan også kontakte min veileder professor Elaine Munthe ved Universitet i Stavanger.

Med vennlig hilsen

Elen Instefjord
Stipendiat
Universitetet i Stavanger, Høgskolen Stord/Haugesund,
04.12.2011

Appendix 4: Information letter, teacher educators

Elen Instefjord

Høgskolen Stord/Haugesund,
Klingenbergvegen 8,
5414 Stord
Telefon: 53 49 15 12

Lærere ved...

[Skriv inn mottakerens adresse]
Telefon: [Skriv inn mottakerens telefonnummer]

Forespørsel om deltakelse i forskningsprosjekt

I forbindelse med min phd ved Universitet i Stavanger gjennomfører jeg et prosjekt som handler om hvordan arbeid med digitale verktøy blir ivaretatt i de nye grunnskolelærerutdanningene - hvilke verktøy som benyttes og hvilke faktorer som hemmer eller fremmer studentenes bruk av digitale verktøy. Målet med prosjektet er å bidra til økt kunnskap om hvordan de ulike lærerutdanningsinstitusjonene arbeider med digitale verktøy og å fremskaffe gode eksempler på bruk av digitale verktøy i opplæringen av nye lærere.

Mine foreløpige funn indikerer at det er forskjeller mellom de ulike lærerutdanningsinstitusjonene. Dette ønsker jeg å studere nærmere i neste fase av prosjektet, og her trenger jeg hjelp fra deg og dine kolleger. De neste ukene vil jeg være til stede på din høgskole, og jeg ønsker å intervjue 3-5 faglærere. Intervjuene vil bli gjennomført som individuelle dybdeintervju. Intervjuene vil ta omkring en time, og vil bli tatt opp på lydbånd. I tillegg ønsker jeg å delta i noen undervisningstimer ved høgskolen for å observere hvordan lærere og lærerstudenter arbeider med digitale verktøy i studiehverdagen. Her vil jeg benytte videokamera og ta notater underveis. Det er kun min veileder og jeg som vil ha tilgang til disse opptakene.

Det er ikke hver enkelt lærers undervisning som står i fokus, men et generelt bilde av bruken av digitale verktøy på de ulike lærestedene. Det er frivillig å delta i prosjektet, og du kan på når som helst trekke deg uten å måtte begrunne dette nærmere. Opplysningene vil bli behandlet konfidensielt, og ingen enkeltpersoner vil kunne gjenkjennes i den ferdige oppgaven. Prosjektet forventes å være avsluttet til sommeren 2014. Opplysningene anonymiseres og opptakene slettes når prosjektet er avsluttet. Prosjektet er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste A/S.

Undersøkelsen er todelt – en intervjudel og en observasjonsdel. Dersom du er villig til å delta i min undersøkelse fall ber jeg deg om å signere den vedlagte samtykkeerklæringen og levere den til meg så snart som mulig. Kryss av for om du er villig til å stille opp på intervju og/eller om det er i orden for deg å være med på mine videoopptak fra undervisningen. Tid og sted for intervju blir vi enige om senere.

Hvis det er noe du lurer på må du gjerne ringe meg på 92 45 88 00, eller sende en e-post til elen.instefjord@hsh.no. Du kan også kontakte min veileder professor Elaine Munthe ved Universitet i Stavanger.

Med vennlig hilsen

Elen Instefjord
Stipendiat
Universitetet i Stavanger, Høgskolen Stord/Haugesund,
06.09.2011

Appendix 5: Information letter, pre-service teachers

Elen Instefjord

Høgskolen Stord/Haugesund,
Klingenbergvegen 8,
5414 Stord
Telefon: 53 49 15 12

Studenter ved...

[Skriv inn mottakerens adresse]
Telefon: [Skriv inn mottakerens telefonnummer]

Forespørsel om deltakelse i forskningsprosjekt

I forbindelse med min phd ved Universitet i Stavanger gjennomfører jeg et prosjekt som handler om hvordan arbeid med digitale verktøy blir ivaretatt i de nye grunnskolelærerutdanningene - hvilke verktøy som benyttes og hvilke faktorer som hemmer eller fremmer studentenes bruk av digitale verktøy. Målet med prosjektet er å bidra til økt kunnskap om hvordan de ulike lærerutdanningsinstitusjonene arbeider med digitale verktøy og å fremskaffe gode eksempler på bruk av digitale verktøy i opplæringen av nye lærere.

I løpet av uke …… (tidsangivelse) kommer jeg til å være til stede på ditt lærested, og jeg ønsker å intervjue 10-15 lærerstudenter. Intervjuene vil bli gjennomført som fokusgruppeintervju hvor det vil være 5 studenter i hver gruppe. Intervjuene vil ta en til to timer, og vil bli tatt opp på lydbånd. I tillegg kommer jeg å delta i noen undervisningstimer ved høgskolen for å observere hvordan lærere og lærerstudenter arbeider med digitale verktøy i studiehverdagen. Her vil jeg benytte videokamera og ta notater underveis. Det er kun min veileder og jeg som vil ha tilgang til disse opptakene.

Det er frivillig å delta i prosjektet, og du kan på når som helst trekke deg uten å måtte begrunne dette nærmere. Opplysningene vil bli behandlet konfidensielt, og ingen enkeltpersoner vil kunne gjenkjennes i den ferdige oppgaven. Prosjektet forventes å være avsluttet til sommeren 2014. Opplysningene anonymiseres og opptakene slettes når prosjektet er avsluttet. Prosjektet er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste A/S.

Undersøkelsen er todelt – en intervjudel og en observasjonsdel. Dersom du er villig til å delta i min undersøkelse fall ber jeg deg om å signere den vedlagte samtykkeerklæringen og levere den til meg så snart som mulig. Kryss av for om du er villig til å stille opp på intervju og/eller om det er i orden for deg å være med på mine videoopptak fra undervisningen. Tid og sted for intervju blir vi enige om senere.

Hvis det er noe du lurer på må du gjerne ringe meg på 92 45 88 00, eller sende en e-post til elen.instefjord@hsh.no. Du kan også kontakte min veileder professor Elaine Munthe ved Universitet i Stavanger.

Med vennlig hilsen

Elen Instefjord
Stipendiat
Universitetet i Stavanger, Høgskolen Stord/Haugesund,
06.09.2011

Appendix 6: Informed consent form, teacher educators/ pre-service teachers

Elen Instefjord

Høgskolen
Stord/Haugesund,
Klingenbergvegen 8,
5414 Stord
Telefon: 53 49 15 12
Mobil: 92 45 88 00

Studenter/lærere ved...

[Skriv inn mottakerens adresse]
Telefon: [Skriv inn mottakerens telefonnummer]

Samtykkeerklæring

Jeg har mottatt informasjon om studien av bruk av digitale verktøy i lærerutdanningene og ønsker å delta i undersøkelsen.

☐ Jeg er villig til å stille på fokusgruppeintervju

☐ Jeg er villig til å være med på videoopptak

Dato

Signatur …… Telefonnummer ……..

Appendix 7: Interview guide, teacher educators

Tema/bakgrunn	Spørsmål
1. Bakgrunnsinformasjon/innledning **(Background information/introduction)** **Innledning - Medieoppslag** • Trønderavisa 26.01.11: "Elever surfer seg bort. Mens lærerne prater, surfer elevene seg bort på nettet. – Nå må vi få en skikkelig debatt omkring bruk av PC i skolen, sier lærer John Arne Sandholm." • Forskning.no 10.04.11: "Slakter digital skolesatsing" • NRK 16.06.11: "Skole og foreldre vet for lite om unges mobilbruk" • Trønderavisa 17.06.11: "Læreren slår av internett" • NRK 29.06.11: "Lærerne har ikke peiling på data. Lærerne er umoderne" • Aftenposten 28.06.11: "Vi kan ikke si vi er fornøyde. IKT satsing til tross – norske 15-åringer befinner seg midt på treet i nettlesing.	Alder, kjønn Hvilken stilling har du? Hvilke fag underviser du i? Hvor mange timer i uken vil du anslå at du vanligvis bruker datamaskin i forbindelse med • undervisningsrelaterte oppgaver (forberedelser og lignende), veiledning og annen kontakt med studenter? • i selve undervisningen? • forskning/ faglig oppdatering og andre jobbrelaterte oppgaver? Lærerens kompetanse når det gjelder bruk av IKT i undervisningen trekkes frem som en mulig årsak til at elever i norsk skole ikke når opp i internasjonale undersøkelser. • Hva mener du om dette – er IKT kompetansen til norske lærere god nok? • På hvilke områder mener dere at det er viktig å arbeide for å bedre IKT kompetanse blant norske lærere? • Hva kan vi gjøre for å styrke lærernes kompetanse?
2. Operasjonalisering av begrepene "bruk av digitale verktøy" "digitale ferdigheter" og "digital kompetanse". **(Understanding of digital tools/digital competence)** **3. Vurdering av egen digital kompetanse** **(Views on their own digital competence)** Digitale verktøy: Monitor 2010. Samtaler om IKT i skolen, 2011: "Digitale verktøy forstås som konkrete hjelpemidler og redskaper for å skrive, publisere, gjøre utregninger produsere osv. Eksempelvis kan digitale læringsressurser være et digitalt hjelpemiddel" (s. 29). Eksempler fra kunnskapsløftet/nasjonale retningslinjer for de nye lærerutdanningene	Kunnskapsløftet presenterer fem ferdigheter som skal gå igjen i alle fag og som er viktige forutsetninger for videre læring: • Å kunne uttrykke seg muntlig • Å kunne uttrykke seg skriftlig • Å kunne lese • Å kunne regne • Å kunne bruke digitale verktøy Hva mener du er viktig for en student å kunne når vi snakker om "bruk av digitale verktøy"? Hvilke digitale verktøy mener du er viktigst for dine studenter? Hva legger du i begrepet "digital kompetanse" i ditt/dine fag? Hva bør en grunnskolelærer kunne om digitale verktøy for å være "digitalt kompetent"? Hvilken kompetanse må du som lærer ha for å hjelpe studentene med å utvikle sin "digitale kompetanse"? Hvordan vurderer du din egen digitale kompetanse?

Digital skole hver dag, ITU 2005: Digital kompetanse er "ferdigheter, kunnskaper, kreativitet og holdninger som alle trenger for å bruke digitale medier for læring og mestring i kunnskapssamfunnet".	
4. Bruk av teknologi i lærerutdanningen (jmf. Pedagogical compatibility/ Technological proficiency) **(Use of technology in teacher education (related to Pedagogical compatibility/ Technological proficiency)**	Mener du at IKT er en vesentlig del av undervisningen her på høgskolen? Hvordan legger du til rette for at studenter skal bruke digitale verktøy i forbindelse med studiene? **Hva er de viktigste grunnene til at du bruker digitale verktøy i din undervisning?** **Hva er de viktigste kriteriene når du velger digitale verktøy?** Hvordan blir digitale verktøy brukt i utdanningen? Kan du gi eksempler på dette? Hvilke forskjeller ser du mellom de ulike fagene i lærerutdanningen? (- hva kan i så fall være årsaken til dette? Faglige forskjeller, tilgang på læringsressurser, lærerens kompetanse etc.) Hvordan arbeides det med digitale verktøy i et didaktisk perspektiv? (Snakker dere om hvordan dere kan benytte digitale verktøy i ulike fag i skolen?) Hvordan har dere arbeidet med oppgaver knyttet til elevenes grunnleggende ferdigheter i IKT i alle fag? I hvor stor grad mener du at kunnskap om arbeid med elevenes grunnleggende ferdigheter vektlegges i studiet?
Arbeidsdagen **I arbeidet med oppgaver**	Har studentene god nok kompetanse i bruk av IKT til å løse oppgaver de skal gjennomføre i utdanningen? Blir det holdt egne kurs som hjelper studentene med å utvikle kunnskap om bruk av IKT/digitale verktøy?
I praksis	På hvilken måte kan arbeidet med digitale verktøy i lærerutdanningen forberede studentene til de utfordringene de møter på i praksis når det gjelder bruk av teknologi?
	God bruk av digitale verktøy i skolen handler ikke om å bruke IKT mest mulig, men å bruke det på en god måte der teknologien kan gi en faglig merverdi. Hva mener du skal til for at lærere blir flinkere til å utvikle den digitale kompetansen som etterlyses i medieoppslagene som vi snakket om innledningsvis? Hva skal til for at du og dine studenter skal bruke digitale verktøy mer/bedre i studiet enn det dere gjør i dag? Hvor får du hjelp til bruk av digitale verktøy i forbindelse med undervisning og studierelatert arbeid? Hvilke forhold tror du vil være viktige for å øke bruk av digitale verktøy og undervisingen på ditt arbeidssted?

Appendix 8: Interview guide, focus group interviews

Tema (Theme)	Spørsmål (Question)
1. Innledning (Introduction – pre-service teachers' understanding of the present situation in school)	Lærerens kompetanse når det gjelder bruk av IKT i undervisningen trekkes frem som en mulig årsak til at elever i norsk skole ikke når opp i internasjonale undersøkelser. • Hva mener dere om dette – er IKT kompetansen til norske lærere god nok? • På hvilke områder mener dere at det er viktig å arbeide for å bedre IKT kompetanse blant norske lærere? • Hva kan vi gjøre for å styrke lærernes kompetanse?
2. Lærerstudentenes forståelse og operasjonalisering av begrepene "bruk av digitale verktøy", "digitale ferdigheter som grunnleggende ferdighet" og "digital kompetanse", og hva en lærer trenger å kunne for å være digitalt kompetent. **(Pre-service teachers perception and operationalisation of the concepts "digital competence", "digital tools", and what it takes to be a digitally competent teacher.**	Hva mener dere er viktig for en elev å kunne når vi snakker om "bruk av digitale verktøy"? Hvilke viktige digitale verktøy mener dere er viktige i ulike fag/for ulike aldersgrupper? Hva legger dere i begrepet "digital kompetanse"? Hvilken kompetanse må læreren ha for å hjelpe eleven med å utvikle sin "digitale kompetanse"? Hva bør en lærer kunne om digitale verktøy for å være "digitalt kompetent"? Hva mener dere skal til for at lærere skal flinkere til å utvikle sin digitale kompetanse?
3. Bruk av teknologi i lærerutdanningen/ i undervisningssammenheng (jmf. Pedagogical compatibility) (Use of technology in teacher education/for teaching and learning)	Mener dere at IKT er en vesentlig del av undervisningen her på høgskolen? Opplever dere at lærerne på høgskolen er "digitalt kompetente" i forhold til det vi snakket om tidligere? Hvordan blir digitale verktøy brukt i utdanningen? Kan dere gi eksempler på dette? Hvilke forskjeller ser dere mellom de ulike fagene i lærerutdanningen? (- hva kan i så fall være årsaken til dette? Faglige forskjeller, tilgang på læringsressurser, lærerens kompetanse etc.) Hvor ofte brukes digitale verktøy? Til hvilket formål benyttes digitale verktøy? Hvordan arbeides det med digitale verktøy i et didaktisk perspektiv? (Snakker dere om hvordan dere kan benytte digitale verktøy i ulike fag i skolen?) Hvordan har dere arbeidet med oppgaver knyttet til elevenes grunnleggende ferdigheter i IKT i alle fag? I hvor stor grad mener dere at kunnskap om arbeid med elevenes grunnleggende ferdigheter har blitt vektlagt i studiet? På hvilken måte har lærerutdanningen bidratt til å utvikle deres "digitale kompetanse"? Hva er det viktigste utdanningen har bidratt til når det gjelder deres digitale kompetanse?

	Kan dere nok til å definere dere som "digitalt kompetente" i en undervisningssammenheng?
4. Bruk av teknologi i studiehverdagen/ i arbeidet med oppgaver – vurdering av egen kompetanse (Jmf. Technological proficiency) (Use of technology for assignments– perception of their own digital competence)	Har dere god nok kompetanse i bruk av IKT til å løse oppgaver dere får i utdanningen? Blir det holdt egne kurs som hjelper dere med å utvikle kunnskap om bruk av IKT/digitale verktøy? Hvilke digitale verktøy bruker dere til daglig? Hvorfor bruker dere digitale verktøy? Hva skal til for at dere skal bruke digitale verktøy mer/bedre i studiet enn det dere gjør i dag?
5. Bruk av teknologi i praksis (Use of technology during teaching practice)	Har dere arbeidet med oppgaver knyttet til elevenes grunnleggende ferdigheter i IKT i alle fag? Kan dere gi eksempler på bruk av digitale verktøy som dere har brukt eller sett andre lærere bruke når dere har vært i praksis? Opplever dere at lærere har god tilgang til digitale læringsressurser i ulike fag? Hvilke utfordringer har dere sett i praksis i forhold til bruken av digitale verktøy? (klasseledelse, uro, Facebook, digital mobbing) På hvilken måte har arbeidet med digitale verktøy i lærerutdanningen forberedt dere til de utfordringene dere støtte på i praksis? Opplever dere at lærere dere møter i praksis kan det som skal til for å defineres som "digitalt kompetente"?

Appendix 9: Questionnaire, teacher educators

Spørreskjema for ansatte på høgskole eller universitet som underviser i grunnskolelærerutdanningene

Dette er en spørreundersøkelse som Følgegruppen for grunnskolelærerutdanningsreformen sender ut til alle som underviser studenter i GLU 1-7, GLU 5-10, integrert MA 1-7 og MA 5-10. Undersøkelsen er en del av vår siste datainnsamling, og resultater vil inngå i rapportering til Kunnskapsdepartementet og institusjonene våren 2015.

Alle institusjoner som deltar vil få innsikt i egne resultater, men detaljeringsgraden av dette vil være avhengig av svarprosenten fra institusjonen/antall deltakere. Alle som svarer på undersøkelsen skal være sikre på at anonymitet ivaretas, derfor vil noen analyser kun bli gjort på storgruppenivå på tvers av alle eller grupper av institusjoner for å sikre stor nok N (antall deltakere). Det er frivillig å delta i undersøkelsen, og det er mulig å trekke seg underveis eller la være å svare på enkelte spørsmål.

Vi håper at du vil finne undersøkelsen interessant, og at du vil bruke litt tid (ca. 10- 15 minutter) på å svare på spørsmålene som følger.

Bakgrunn

Først noen spørsmål om deg:

Kjønn

(1) ❑ Mann
(2) ❑ Kvinne

Jeg er født i...
(oppgi fødselsår - 4 siffer)

_____

Bakgrunn

Høyeste utdanningsgrad

(1) ❑ Profesjonsutdanning(førskolelærer/grunnskolelærer(adjunkt)/faglærer
(2) ❑ Mastergrad eller hovedfag
(3) ❑ PhD eller doktorgrad

Jeg er ansatt som:

(1) ❑ Høgskole-/universitetetslærer
(2) ❑ Høgskole-/universitetslektor
(3) ❑ Førstelektor
(5) ❑ Førsteamanuensis
(4) ❑ Dosent
(6) ❑ Professor

Bakgrunn

Hvilken høgskole/universitet er du ansatt ved?

(1) ❑ Høgskolen i Bergen
(2) ❑ Høgskolen i Buskerud og Vestfold (Campus Drammen)
(3) ❑ Høgskolen i Buskerud og Vestfold (Campus Vestfold)
(4) ❑ Høgskolen i Hedmark
(5) ❑ Høgskolen i Nesna
(6) ❑ Høgskolen i Nord-Trøndelag
(7) ❑ Høgskolen i Oslo og Akershus
(8) ❑ Høgskolen i Sogn og Fjordane
(9) ❑ Høgskolen i Stord/Haugesund
(10) ❑ Høgskolen i Sør-Trøndelag
(11) ❑ Høgskolen i Telemark
(12) ❑ Høgskolen i Volda
(13) ❑ Høgskolen i Østfold
(14) ❑ NLA Høgskolen
(15) ❑ Universitetet i Agder
(16) ❑ Universitetet i Nordland
(17) ❑ Universitetet i Stavanger
(18) ❑ Universitetet i Tromsø (Campus Alta)
(19) ❑ Universitetet i Tromsø (Campus Tromsø)
(20) ❑ Samisk Høgskole

Stillingsprosent
(oppgi stillingsprosent ved denne høgskolen/universitetet for denne høsten):

_____

Arbeidserfaring

Antall års arbeidserfaring:

	Ingen erfaring	Mindre enn ett år	Mer enn ett år. Vennligst sett inn antall år (rund av til nærmeste hele år)
- Totalt antall år du har vært ansatt i høgskole/universitetssystemet	(1) ❑	(2) ❑	(3) ❑ _____
- Totalt antall år du har vært ansatt ved denne høgskolen/universitetet	(1) ❑	(2) ❑	(3) ❑ _____
- Totalt	(1) ❑	(2) ❑	(3) ❑ _____

	Ingen erfaring	Mindre enn ett år	Mer enn ett år. Vennligst sett inn antall år (rund av til nærmeste hele år)
antall år du har primært arbeidet med å utdanne allmenn/grunnskolelærerstudenter på høgskolen/universitetet			
- Antall år du har undervist i barneskole (1.-7. trinn)	(1) ❑	(2) ❑	(3) ❑ _____
- Antall år du har undervist i ungdomsskole (8.-10.trinn)	(1) ❑	(2) ❑	(3) ❑ _____
- Antall år du har undervist i VGS (11.-13.trinn)	(1) ❑	(2) ❑	(3) ❑ _____
- Antall år du har arbeidet i barnehage	(1) ❑	(2) ❑	(3) ❑ _____

Fag og studieprogram

Fag og studieprogram du underviser i dette semesteret (her kan du velge flere fag, og det er også mulig å krysse av for begge studieprogrammene)

	GLU 1-7	GLU 5-10
PEL	(1) ❑	(2) ❑
Matematikk	(1) ❑	(2) ❑
Norsk	(1) ❑	(2) ❑
Naturfag	(1) ❑	(2) ❑
Samfunnsfag	(1) ❑	(2) ❑
Historie	(1) ❑	(2) ❑
RLE	(1) ❑	(2) ❑
Engelsk	(1) ❑	(2) ❑
Spansk, fransk, tysk/andre språkfag som kan være 2. fremmedspråk i grunnskolen	(1) ❑	(2) ❑
Kroppsøving	(1) ❑	(2) ❑
Musikk	(1) ❑	(2) ❑
Kunst & Håndverk	(1) ❑	(2) ❑
Mat & Helse	(1) ❑	(2) ❑
Samisk	(1) ❑	(2) ❑
Duodji	(1) ❑	(2) ❑
Annet	(1) ❑	(2) ❑

Om grunnskolelærerutdanningene og reformen

Forskrift om rammeplan for grunnskolelærerutdanningene for 1.–7. trinn og 5.–10. trinn definerer tydelige målsetninger for utdanningene. Nedenfor har vi listet opp noen av de mest sentrale målsetningene i reformen.

I hvilken grad vil du si at grunnskolelærerutdanningene ved ditt lærested har lykkes med:

	1 I svært liten grad	2	3	4	5	6 I svært stor grad
- å skape en integrert utdanning	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- å skape en profesjonsrettet utdanning	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- å skape en forskningsbasert utdanning	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- å skape en utdanning med to differensierte utdanningsløp	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- å skape en utdanning med høy faglig kvalitet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- å legge til rette for internasjonalisering i utdanning	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- å legge til rette for arbeid med grunnleggende ferdigheter på tvers av fagene	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- å legge til rette for arbeid med flerkulturelle perspektiver på tvers av fagene	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- å legge til rette for arbeid med samiske perspektiver på tvers av fagene	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Masterløp i grunnskolelærerutdanningene

Status blant nåværende GLU-studenter

Regjeringen har nylig varslet at de ønsker at grunnskolelærerutdanningene skal bli femårige masterutdanninger fra høsten 2017. Vi ber deg om å tenke tilbake på det kullet med GLU-studenter som du har hatt mest undervisning for i studieåret 2013/2014.

	Oppgi %
- Hvor stor andel (ca) av disse studentene tenker du ville være faglig kvalifisert til å fortsette på et masterløp?	_____
- Hvor stor andel (ca) av disse studentene tenker du ville være motivert for å fortsette	_____

Oppgi %

på et masterløp?

Arbeidsmiljø - samarbeid

Nedenfor følger noen utsagn om arbeidsmiljøet ved institusjonen du er tilknyttet. Vi ber deg om å velge det alternativet som best angir hvor enig eller uenig du er i disse påstandene.

	1 Helt uenig	2	3	4	5	6 Helt enig
– Jeg samarbeider nært og godt med flere av mine kolleger.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg spør gjerne kolleger om tips eller råd.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kan stole på at mine kolleger vil hjelpe meg dersom jeg har behov for det.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Det er blitt mye mer samarbeid etter innføring av de nye lærerutdanningene.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Vi bruker altfor mye tid til samarbeid.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Arbeidsmiljø - støtte fra ledelsen

Velg det alternativet som best angir ditt svar.

	1 Helt uenig	2	3	4	5	6 Helt enig
– Når avgjørelser blir tatt om de nye lærerutdanningene, blir de personene det angår tatt med på råd.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Vi har gode informasjonskanaler, slik at de som tar avgjørelser har kjennskap til det som foregår.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– På denne arbeidsplassen blir avgjørelser tatt på de nivåer som har best informasjon om saken.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Ledelsen har gitt god støtte i utvikling av nye planer for lærerutdanningene.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Ledelsen har jobbet hardt for å få til gode systemer for	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Helt uenig	2	3	4	5	6 Helt enig
implementering av reformen.						
– Toppledelsen på denne institusjonen har vist stor interesse for vårt arbeid med reformen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Min nærmeste leder/ledergruppe viser stor interesse for min undervisning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Vi har gode muligheter for å få støtte til å utvikle vår undervisning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Vi har gode muligheter til å få støtte til å utvikle vår kompetanse som forskere.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Arbeidsmiljø - undervisning og forskning

– Hvor stor prosentdel av din stilling disponerer du til undervisning dette skoleåret? (angi svaret i %) _____

– Hvor mange timer utgjør dette? (angi antall timer) _____

– Hvor stor prosentdel av din stilling disponerer du til FoU-virksomhet dette skoleåret? (angi svaret i %) _____

– Hvor mange timer utgjør dette? (angi antall timer) _____

Arbeidsmiljø

Hvor stor del av din FoU-virksomhet er rettet mot:

	1 Ingen FoU-tid	2	3	4	5	6 All FoU-tid
– Fagdisiplin	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Fagdidaktiske spørsmål	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Pedagogiske/spesialpedagogiske spørsmål	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hvor mange poenggivende publikasjoner hadde du i 2013? (angi antall:)

_____

Dine muligheter for påvirkning

Velg det alternativet som best angir ditt svar.

	1 Ingenting	2	3	4	5	6 Svært mye
– Hvor mye kan du gjøre for å fremme studenters læring?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
–Hvor mye kan du gjøre for å motivere studenter når de arbeider med vanskelige oppgaver?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Hvor mye kan du gjøre for at studenter skal kunne huske og bruke det de har lært tidligere?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Hvor mye kan du gjøre for å motivere studenter til økt innsats?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Hvor mye kan du gjøre for å fremme samarbeid blant studenter?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Hvor mye kan du gjøre for å få studenter til å arbeide med litteratur/pensum?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Hvor mye kan du gjøre for å påvirke studenters oppførsel i timene?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Hvor mye kan du påvirke studenters engasjement i timene?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Hvor mye kan du påvirke studenters engasjement når de samarbeider i grupper?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Studenter og undervisning

Studentenes arbeidsvaner

Nedenfor følger noen utsagn om studenter og undervisning ved institusjonen du er tilknyttet. Vi ber deg om å velge det alternativet som best angir hvor enig eller uenig du er i disse påstandene.

	1 Svært uenig	2	3	4	5	6 Svært enig
- Studentene er godt forberedt til timene	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Det er altfor mange studenter som ikke møter opp til undervisningstimene	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Det er unødige forstyrrelser fordi studenter kommer og går under undervisningen	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Studentene har gode forutsetninger i fag jeg underviser i	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Grunnleggende ferdigheter

Velg det alternativet som best angir ditt svar.

	1 Ikke i det hele tatt	2	3	4	5	6 I svært stor grad
- Jeg vektlegger lesing som grunnleggende ferdighet i min undervisning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Mine studenter lærer mye om hvordan de kan fremme elevers læring gjennom å styrke deres leseferdigheter i mitt fag.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Mine studenter har god innsikt i hvordan elevers skriveferdigheter kan utvikles gjennom undervisning i mitt fag.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg vektlegger skriving som grunnleggende ferdighet i min undervisning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Mine studenter kan sette i verk tiltak for styrke elevers regneferdigheter i mitt fag.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Mine studenter øver på egne muntlige ferdigheter i mitt fag.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Mine studenter har fått trening i å lede og å involvere mange i klasseromsdiskusjoner i mitt fag.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Bruk av digitale verktøy

Velg det alternativet som best angir ditt svar.

	1 Ikke i det hele tatt	2	3	4	5	6 I svært stor grad
- Det er eksterne kursholdere/forelesere som har gitt studentene opplæring i bruk av digitale verktøy.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg vektlegger opplæring for studenter i bruk av digitale verktøy i min undervisning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg er en god rollemodell for studentene i forhold til bruk av digitale verktøy i undervisningen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg har god innsikt i bruk av digitale verktøy for å fremme elevers læring.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg har god kompetanse i å bruke interaktiv tavle (f.eks. SmartBoard).	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Ikke i det hele tatt	2	3	4	5	6 I svært stor grad
- Jeg kan støtte studenter i deres læring om digitale verktøy for vurdering av elever.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg vektlegger etiske problemstillinger knyttet til skolens og elevers bruk av sosiale medier.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Flerkulturelle perspektiv

Velg det alternativet som best angir ditt svar.

	1 Ikke i det hele tatt	2	3	4	5	6 I svært stor grad
- Jeg kjenner til metoder for å organisere undervisning i grupper hvor flere språk er til stede	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg kjenner til metoder som øker læringsmuligheter for flerspråklige elever	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg kan gi gode eksempler på hvordan undervisning ivaretar elevers språk/religion/kultur som ressurs	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg vet hvordan jeg kan anvende ulike begrepsforståelser blant elever til å fremme læring hos alle	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Forskningsbasert undervisning

Under har vi listet opp en rekke påstander som gjelder forskningsbasert undervisning i studiet. På en skala fra 1 til 6, der 1 = Stemmer ikke i det helt tatt og 6 = Stemmer helt, vi vil at du skal markere det alternativet som best beskriver din oppfatning av hver påstand.

I hvor stor grad stemmer påstandene under med din oppfatning av forskningsbasert undervisning i studiet?

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
- Vi har forskningslitteratur på pensum som er skrevet av noen av mine kolleger/meg selv.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg har fortalt studentene om min egen forskning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Min forskning er svært relevant for mine studenter.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg har involvert student(er) i et forskningsprosjekt.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
- Jeg har selv utført forskning i klasserom eller på en skole.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg hadde ønsket at det var større mulighet til å involvere studenter i forskning i løpet av studietiden.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Vi har hatt mange diskusjoner om ny forskning i min undervisning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg vektlegger at studenter skal søke etter ny forskningslitteratur i internasjonale databaser som f.eks. ERIC og EBSCO.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg vektlegger at studenter skal få god trening i å lese engelskspråklige forskningsartikler.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg har forsøkt å unngå å bruke engelskspråklige tekster som pensum for studentene.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg vektlegger at studentene skal utvikle kunnskap og ferdigheter innen forskningsmetoder som de vil ha bruk for som lærer.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Praksisopplæring

Under har vi listet opp en rekke påstander som gjelder praksisopplæring i studiet. På en skala fra 1 til 6, der 1 = Stemmer ikke i det helt tatt og 6 = Stemmer helt, vi vil at du skal markere det alternativet som best beskriver din oppfatning av hver påstand.

I hvor stor grad stemmer påstandene under med din oppfatning av praksisopplæring i studiet?

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
- Jeg forbereder studentene godt til oppstart av praksisopplæringen foran hver praksisperiode.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg møter praksisveiledere før hver praksisperiode.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg bruker god tid på å planlegge praksisperioder sammen med studenter og ansatte ved praksisskolene.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg er godt kjent med læringsutbyttemålene for hver praksisperiode.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Praksisopplæringsperiodene gir studentene	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
mulighet til å koble det de har lært på campus med det som skjer i skolen.						
- Det er et tett samarbeid mellom meg og lærerne på praksisskolene.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg deltar i deler av praksisopplæringen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg bruker studentenes praksiserfaringer i undervisningen på høgskolen/universitetet.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg vektlegger at studentene må demonstrere kritisk refleksjon i etterkant av praksisperiodene.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Det er vanskelig å trekke erfaringer fra praksis inn i undervisningen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Utdanningen har et velfungerende system for å evaluere studentenes erfaringer fra praksisopplæring.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Høgskolen/universitetet etterspør øvingslærernes erfaringer med studentenes praksisopplæring.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Høgskolen/universitetet tar hensyn til øvingslærernes erfaringer med praksisopplæring.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Øvingslærerne er med på å videreutvikle praksisopplæring i samarbeid med høgskolen/universitetet.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Skikkethet

Under har vi listet opp en rekke påstander som gjelder skikkethet. Vennligst velg det alternativet som best angir hvor enig/uenig du er med disse påstandene.

	1 Helt uenig	2	3	4	5	6 Helt enig
- Praksisskolene har et altfor stort ansvar når det gjelder vurdering av studenters skikkethet.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg kjenner ikke studentene godt nok til å kunne vurdere deres skikkethet til yrket.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg drøfter studentenes skikkethet jevnlig med kolleger.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Studenter som jeg underviser er klar over arbeidet vi	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Helt uenig	2	3	4	5	6 Helt enig

gjør med skikkethetsvurdering.

Studenters overgang til læreryrket

Basert på din erfaring (også om du er nytilsatt), hvor stor del av nyutdannede lærere vil du si ...

	Ingen	1/4	1/2	3/4	Alle
... klarer overgangen til læreryrket på en utmerket måte, så å si ingen problemer.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
... har moderate problemer med overgangen, litt problemer – men ikke store problemer.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
... har store problemer med overgangen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

Tusen takk for hjelpen!

Vennligst trykk "avslutt" for å lagre din besvarelse.

Appendix 10: Questionnaire, pre-service teachers

DITT TILBAKEBLIKK PÅ GRUNNSKOLELÆRERUTDANNINGENE:

Hva har du erfart i utdanningen – hva har du lært – hvordan vurderer du utdanningen?

Dette er en spørreundersøkelse som sendes ut til alle studenter i Norge som startet på de nye grunnskolelærerutdanningene høsten 2010, og som nå er inne i 4. studieår. Målet med undersøkelsen er å finne ut hvordan du har opplevd utdanningen og hvordan du vurderer dine egne muligheter som nyutdannet lærer. Dersom du har valgt å ta en masterutdanning og dermed har et år igjen av studiet, vil vi selvsagt også vite det!

Det er svært viktig for oss å få kunnskap om nettopp dine erfaringer fra utdanningen. Vi håper derfor at du har mulighet til å sette av litt tid til å svare på spørsmål knyttet til det studiet du er tatt opp på.

Din deltakelse vil være til stor betydning for lærestedene og fremtidige lærerstudenter når det gjelder videre utvikling av grunnskolelærerutdanningene!

Studieprogram

Hvilket program er du tatt opp på?

(1) ❑ Grunnskolelærerutdanning for 1.-7. trinn (4-årig)
(2) ❑ Grunnskolelærerutdanning for 5.-10. trinn (4-årig)
(3) ❑ Samisk grunnskolelærerutdanning for 1.-7. trinn
(4) ❑ Integrert master for 1.-7. trinn
(5) ❑ Integrert master for 5.-10. trinn
(6) ❑ Et 2-årig mastergradsprogram

Fullfører du utdanningen denne våren (4-årig løp), eller tar du et 5-årig masterløp?

(1) ❑ Fullfører 4-årig løp
(2) ❑ Har valgt 5-årig masterløp

Valg av masterløp

Dersom du har valgt et masterløp, hvilket program var du tatt opp på de tre første studieårene?

(1) ❑ Grunnskolelærerutdanning for 1.-7. trinn
(2) ❑ Grunnskolelærerutdanning for 5. -10. trinn
(3) ❑ Samisk grunnskolelærerutdanning for 1.-7. trinn

Dersom du har valgt et masterløp, hvilket fag har du valgt å fordype deg innenfor?

(1) ❑ Drama
(2) ❑ Kroppsøving
(3) ❑ Kunst & håndverk
(5) ❑ Mat & helse
(4) ❑ Matematikk
(6) ❑ Musikk
(7) ❑ Naturfag
(8) ❑ Norsk
(9) ❑ RLE
(10) ❑ Samfunnsfag
(11) ❑ Samisk
(12) ❑ Spesialpedagogikk
(13) ❑ Pedagogikk
(15) ❑ Engelsk
(16) ❑ Fremmedspråk
(17) ❑ Annet: _____

Studiested

Hvilken høgskole/universitet er du student ved akkurat nå?

(1) ❑ Høgskolen i Bergen
(2) ❑ Høgskolen i Buskerud og Vestfold
(3) ❑ Høgskolen i Hedmark
(4) ❑ Høgskolen i Nesna
(5) ❑ Høgskolen i Nord-Trøndelag
(6) ❑ Høgskolen i Oslo og Akershus
(7) ❑ Høgskolen i Sogn og Fjordane
(8) ❑ Høgskolen i Stord/Haugesund
(9) ❑ Høgskolen i Sør-Trøndelag
(10) ❑ Høgskolen i Telemark
(11) ❑ Høgskolen i Volda
(12) ❑ Høgskolen i Østfold
(13) ❑ NLA Høgskolen
(14) ❑ Universitetet i Agder
(18) ❑ Universitetet i Nordland
(15) ❑ Universitetet i Stavanger
(16) ❑ Universitetet i Tromsø
(17) ❑ Samisk Høgskole

Fag

Hvilke fag (utenom Pedagogikk og elevkunnskap eller Profesjonsfag ved UiT) har du avlagt eksamen i som grunnskolelærerstudent?

Oppgi antall studiepoeng du har fullført (bestått eksamen i) i hvert av fagene under:Kryss av de

fagene som du har dette studieåret, og fag som du har hatt tidligere i studiet (du kan krysse av for flere):

	0 stp	15 stp	30 stp	45 stp	60 stp
Engelsk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Fremmedspråk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Kroppsøving	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Kunst & håndverk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Matematikk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Mat & helse	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Musikk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Naturfag	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Norsk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
RLE	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Samfunnsfag	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Samisk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑
Annet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑

Kjønn og alder

Jeg er...

(1) ❑ Mann
(2) ❑ Kvinne

Din alder:

(1) ❑ 21 - 25 år
(2) ❑ 26 - 29 år
(3) ❑ 30 - 35 år
(4) ❑ Eldre enn 35

Erfaring fra arbeid med barn og unge

	Nei	Litt	Ganske mye	Svært mye
– Jeg har arbeidet som lærer i løpet av studietiden.	(1) ❑	(2) ❑	(3) ❑	(4) ❑
– Jeg har erfaring fra arbeid med barn/ungdommer før jeg begynte å studere.	(1) ❑	(2) ❑	(3) ❑	(4) ❑

Studentmobilitet i studietiden

De nye grunnskolelærerutdanningene er utformet slik at de skal legge til rette for mobilitet mellom læresteder i Norge og gi mulighet for et internasjonalt semester. Vennligst kryss av for det svaret som best beskriver dine erfaringer med mobilitet i løpet av de siste fire årene:

	JA	NEI
– Jeg har tatt alle eksamener ved denne institusjonen.	(1) ❑	(2) ❑
– Jeg har vurdert å ta fag et annet sted, men gjorde det ikke likevel.	(1) ❑	(2) ❑
– Jeg har tatt fag ved andre institusjoner uten å flytte dit (nett eller samlingsbasert).	(1) ❑	(2) ❑
– Av personlige grunner har jeg flyttet til et annet sted i løpet av de siste fire årene og har derfor byttet lærested.	(1) ❑	(2) ❑
– Jeg har byttet lærested for å få det fagvalget jeg ønsket.	(1) ❑	(2) ❑
– Jeg har tatt deler av min utdanning ved en utenlandsk institusjon i løpet av de siste fire årene.	(1) ❑	(2) ❑
– Jeg har hatt en praksisopplæringsperiode i utlandet.	(1) ❑	(2) ❑

Studentmobilitet i studietiden

Nedenfor følger noen utsagn om valg av utdanningsprogram og mobilitet. Kryss av for det alternativet som best angir hvor enig eller uenig du er med disse påstandene.

	1 Helt uenig	2	3	4	5	6 Svært enig
– Det ville være helt umulig for meg å flytte i løpet av studietiden.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Dersom dette studiestedet bare hadde hatt tilbud om en lærerutdanning (enten GLU 1-7 ELLER GLU 5-10), ville jeg ha valgt den, selv om det ikke var mitt førstevalg.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Dersom dette studiestedet ikke hadde hatt tilbud om lærerutdanning for grunnskolen i det hele tatt, ville jeg ha valgt en annen utdanning på samme sted (f.eks. barnevern eller en annen utdanning).	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Dersom dette studiestedet ikke hadde hatt tilbud om lærerutdanning i det hele tatt, ville jeg ha valgt å reise til et annet sted for å få den lærerutdanningen jeg ville ha.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har fått god informasjon om muligheter for å ta fag ved andre læresteder.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har fått god informasjon om muligheter for å ha et internasjonalt	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Helt uenig	2	3	4	5	6 Svært enig

semester i løpet av studietiden.

Organisering av studieprogram

Hvordan er lærerutdanningsprogrammet du går på organisert? Sett kryss ved siden av den beskrivelsen som BEST passer for den utdanningen du er tatt opp på.

(1) ❑ ORDINÆRT: Jeg har all undervisning på høgskolen/universitetet (bortsett fra praksisopplæring), og jeg har undervisning på høgskolen/universitetet hver uke.

(2) ❑ SAMLINGSBASERT: Jeg møter medstudenter og lærere noen uker hvert år på høgskolen/universitetet. Vi har jevnlige samlinger der. Resten av tiden studerer jeg hjemmefra, gjerne nettstøttet.

(3) ❑ NETTBASERT: Jeg følger undervisning på høgskolen/universitetet hjemmefra ved hjelp av PC. Da ser jeg på undervisning som foregår på høgskolen/universitetet og kan bidra i forelesninger og diskusjoner.

(4) ❑ NETTVERKSBASERT: Jeg har undervisning på flere steder i regionen/jeg har lærere fra flere høgskoler/universiteter som samarbeider om å gi meg min lærerutdanning.

(5) ❑ DESENTRALISERT: Lærere ved høgskolen/universitetet reiser ut til mitt hjemsted/et sted i nærheten for å gi undervisning lokalt slik at vi ikke må reise inn til høgskolen/universitetet.

(6) ❑ ANNET: Ingen av disse beskrivelsene passer best for den utdanningen jeg går på.

Om studiet

Tenk tilbake på de fire siste årene. Hvor uenig eller enig er du i følgende påstander?

	1 Helt uenig	2	3	4	5	6 Svært enig
– Jeg har et svært positivt inntrykk av studiet.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Det har vært tydelig gjennom hele løpet at studiet skal utdanne til læreryrket.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Alle lærerne jeg har, er opptatt av at jeg skal bli lærer.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg vil anbefale dette studiet til andre.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Det er svært faglig sterke lærere på denne utdanningen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Det er svært engasjerende lærere på denne utdanningen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Dette studiet stiller høye krav til meg som student.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Dette studiet forutsetter at jeg leser pensum grundig.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Studiet er så krevende at du kan ikke være borte fra undervisning hvis du vil henge med.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg leser faglitteratur jevnlig.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Dette studiet er faglig krevende.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Lærerne på denne utdanningen er flinke til å undervise.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Om studiet

Tenk tilbake på dine fire siste år som student. Hva er din gjennomsnittskarakter totalt sett?

(1) ❑ A
(2) ❑ B
(3) ❑ C
(4) ❑ D
(5) ❑ E
(6) ❑ F

Hva har du lært i løpet av din utdanning?

Grunnskolelærerutdanningene har spesifikke læringsmål for studentene, og i det som følger, ber vi deg om å vurdere i hvor stor grad du mener du har tilegnet deg kunnskap og ferdigheter slik det er spesifisert i Forskriften for grunnskolelærerutdanningene. Vi ber deg igjen om å oppgi dette ved å krysse av for det tallet mellom 1 og 6 som best beskriver din vurdering av egen læring:

Kunnskap, ferdigheter og generell kompetanse knyttet til barns og unges læring, og undervisning som fremmer barns og unges læring

	1 Ikke i det hele tatt	2	3	4	5	6 I svært stor grad
– Jeg er i stand til å planlegge, gjennomføre og evaluere undervisning som tar hensyn til elevenes ulike forutsetninger.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har lært ulike metoder for å kunne finne ut hva elever forstår eller misforstår i et emne (f.eks. bruk av diagnostiske spørsmål eller utvikling av kartleggingsprøver).	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kan bruke kunnskap om elevers forståelse i planlegging av undervisning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har lært å anvende forskning når jeg planlegger hvordan undervisning skal foregå	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har lært å anvende læringsteorier når vi planlegger og gjennomfører undervisning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kan bruke teoretiske begreper i analyse av klasseromsinteraksjon.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kan planlegge, gjennomføre og vurdere tverrfaglige/flerfaglige undervisningsprosjekter.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Ikke i det hele tatt	2	3	4	5	6 I svært stor grad
– Jeg oppsøker ny forskning når jeg skal planlegge undervisningsmåter.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har god nok fagkunnskap i undervisningsfagene mine til å gi elevene god undervisning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hva har du lært i løpet av din utdanning?

Tilpasset opplæring

	1 Ikke i det hele tatt	2	3	4	5	6 I svært stor grad
– Jeg er i stand til å gjennomføre undervisning som vil være relevant for elever med ulik bakgrunn.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kan motivere elever (med ulik sosial, kulturell eller evnemessig bakgrunn) til læring.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har innsikt i motivasjonsteori og forskning om elevers motivasjon.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kan anvende kunnskap om elevers motivasjon i min undervisning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hva har du lært i løpet av din utdanning?

Tilrettelegge og lede gode læringsmiljøer

	1 Ikke i det hele tatt	2	3	4	5	6 I svært stor grad
– Jeg vet hvordan jeg inngår i en positiv og støttende relasjon med hver enkelt elev.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Det vil være utfordrende for meg å klare å skape et miljø hvor elever opplever trygghet og tillit.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har erfaring med å bruke elevers perspektiver og innspill i undervisning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Å virkelig engasjere elever i aktive læringsfellesskap, er noe jeg vil trenge hjelp til.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg vet hva jeg må gjøre for å skape en positiv kultur for læring.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg vil være i stand til å avdekke mobbing i	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Ikke i det hele tatt	2	3	4	5	6 I svært stor grad
en elevgruppe.						
– Det er vanskelig å vite hva man skal gjøre for å stoppe mobbing.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg vil være i stand til å ta opp vanskelige spørsmål som f.eks. mobbing, i en elevgruppe.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg vil være i stand til å ta opp vanskelige spørsmål med foresatte.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hva har du lært i løpet av din utdanning?

Læringsledelse

	1 Ikke i det hele tatt	2	3	4	5	6 I svært stor grad
– Jeg har utviklet forståelse for hvorfor det er viktig å formidle læringsmål for en undervisningstime (evt undervisningsøkt hvis det er flere timer i strekk).	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har lært mye om det å skape gode strukturer i undervisning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Det er umulig for en lærer å gjøre undervisning og læring relevant for alle elever.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg vil ha problemer med å formidle høye forventninger til elevene.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kan bevisstgjøre og ansvarliggjøre elevene i eget læringsarbeid.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg vet hvordan jeg kan involvere elever og gi dem mulighet for medvirkning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hva har du lært i løpet av din utdanning?

Vurdering for læring og av læring

	1 Ikke i det hele tatt	2	3	4	5	6 I svært stor grad
– Jeg har fått erfaring i å gi formativ tilbakemelding til elever i løpet av praksisperioder.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Mine praksislærere har lært meg mye om	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Ikke i det hele tatt	2	3	4	5	6 I svært stor grad
formativ vurdering.						
– Mine faglærere har lært meg mye om formativ vurdering.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har utviklet gode tilbakemeldingsferdigheter i løpet av disse fire årene.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kan utvikle gode kriterier til bruk i vurderingsarbeid.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kan bruke klasseromsamtale som konkret vurderingspraksis.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg vet hvordan jeg oppnår kompetansemål sammen med elevene.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kan tolke kartleggingsprøver og anvende resultater for å stake ut veien videre for en elev.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg er i stand til å vurdere elevarbeid i forhold til kompetansemål.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg er i stand til å planlegge undervisning for å nå et bestemt kompetansemål.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Hva har du lært i løpet av din utdanning?

Skole-hjem samarbeid

	1 Ikke i det hele tatt	2	3	4	5	6 I svært stor grad
– Jeg vet hvordan jeg kan motivere foreldre til å formidle positive forventninger til eleven.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kjenner til metoder som viser fram foreldrenes og elevens forventninger til undervisning og skolen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Foresatte må kunne ha en reell medvirkning i min undervisning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har god innsikt i hvordan å planlegge og gjennomføre samtaler med foresatte.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har lært om hvordan skoler arbeider med skole-hjem samarbeid i løpet av praksisopplæring.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Antall timer per uke som blir brukt til studiene

Vi ber deg vurdere tidsbruken din dette studieåret (2013-2014) og forsøke å angi hvor mange timer per uke du mener at du bruker på de forskjellige studieaktivitetene som er nevnt nedenfor.

– Hvor mange timer i uken er du vanligvis tilstede på forelesninger/annen undervisning? (rund av til nærmeste hele time). ____

– Hvor mange timer i uken bruker du til å lese pensum/lese relevant faglitteratur? (rund av til nærmeste hele time). ____

– Hvor mange timer i uken bruker du til å arbeide med arbeidsoppgaver – alene eller sammen med andre? (rund av til nærmeste hele time). ____

Praksisopplæring

Praksisopplæring er en viktig del av din utdanning. Nedenfor gjengir vi en rekke påstander om både forberedelse, gjennomføring, og oppfølging av praksiserfaringer som vi ber deg vurdere. Angi ditt svar på en skala fra 1 til 6.

	1 Ikke i det hele tatt	2	3	4	5	6 I svært stor grad
– Mine faglærere forberedte meg godt til oppstart av praksisopplæringen foran hver praksisperiode.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg visste hva som var forventet av meg i praksisperioden.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg møtte min veileder før hver praksisperiode.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg er godt kjent med læringsutbyttemålene for hver praksisperiode.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Praksisskolene jeg har vært på, har vært svært gode læringsarenaer for meg.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Alle lærere på praksisskolene har vært åpne for at jeg kan stille spørsmål, observere, diskutere og lære sammen med dem.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Mine veiledere har vært dyktige lærere for elevene.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Mine veiledere har vært opptatt av relevant forskning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg er blitt dyktigere til å analysere klasseromsinteraksjon gjennom mine praksisveiledere.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har lært å gi konstruktiv faglig tilbakemelding til elever, takket mine	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Ikke i det hele tatt	2	3	4	5	6 I svært stor grad
praksisveiledere.						
– Alle medstudenter bidrar aktivt i veiledningssamtaler som jeg har vært på.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Praksisopplæringsperiodene har gitt meg anledning til å koble det jeg har lært på høgskolen/universitetet med det som skjer i skolen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har fått erfaring med flerkulturell opplæring i løpet av praksisperiodene.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Veiledningsøktene på praksisskolene støttet opp under det vi hadde lært på høgskolen/universitetet før praksis.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Det er et tett samarbeid mellom lærerne på høgskolen/universitetet og lærerne på praksisskolene.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Faglærere på høgskolen/universitetet bruker våre praksiserfaringer i undervisningen på høgskolen/universitetet.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Utdanningen har et godt system for å evaluere studentenes erfaringer fra praksisopplæring.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har fått praksis i undervisningsfagene mine.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Opplæringen gjennom studiet

Under har vi listet opp en rekke elementer som er knyttet til studiet du går på. På en skala fra 1 til 6, der 1= Stemmer ikke i det hele tatt og 6= Stemmer helt, vil vi at du skal markere i hvor stor grad du mener at studiet har vektlagt de ulike elementene.

Leseopplæring og lesing som grunnleggende ferdighet

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
– Jeg har kunnskap om teorier innen leseopplæring, med særlig vekt på begynneropplæringen (GLU 1-7 studenter)/videre leseopplæring (GLU 5-10 studenter).	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har kunnskap om leseforståelse.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har kunnskap om flerspråklighet, flerspråklig praksis og om det å lære norsk som andrespråk.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har kunnskap om hvordan lesevansker kan forebygges.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
– Jeg har arbeidet med lesing som grunnleggende ferdighet i alle fag jeg har tatt i lærerutdanningen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har lært hvordan jeg kan styrke elevers leseferdigheter i alle fag som jeg har tatt i lærerutdanningen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Det er stort sett i faget norsk jeg har lært noe om lesing og hvordan styrke elevers leseferdigheter.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Opplæringen gjennom studiet

Skriveopplæring og skriving som grunnleggende ferdigheter

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
– Jeg har kunnskap om skriveteorier.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har kunnskap om skrivestrategier.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kan sette iverk relevante tiltak for å styrke elevers skriveferdigheter.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har lært hvordan jeg kan bruke skriving for å styrke elevers læring i alle fagene som jeg har tatt i lærerutdanningen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Det er stort sett i faget norsk jeg har lært noe om skriving og hvordan styrke elevers skriveferdigheter.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Opplæringen gjennom studiet

Regning som grunnleggende ferdighet

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
– Jeg kan sette i verk tiltak for å styrke elevers regneferdigheter.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har lært hvordan jeg kan bruke regning for å styrke elevers læring i alle fagene som jeg har tatt i lærerutdanningen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Det er stort sett i faget matematikk jeg har lært noe om regning og og hvordan styrke elevers regneferdigheter.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Opplæringen gjennom studiet

Muntlige ferdigheter

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
– Jeg har kunnskap om muntlig som grunnleggende ferdighet hos elevene.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg vet hvordan jeg kan fremme elevenes ferdigheter i å presentere et fagstoff muntlig.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg vet hvordan jeg kan fremme elevenes ferdigheter til å ta del i og føre diskusjoner.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har lært hvordan jeg kan bruke muntlige ferdigheter til å styrke elevens læring i alle fagene som jeg har hatt i lærerutdanningen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Det er stort sett i norsk jeg har arbeidet med muntlig som grunnleggende ferdighet.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Opplæringen gjennom studiet

IKT og digital kompetanse

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
– Eksterne kursholdere/forelesere har gitt meg opplæring i bruk av digitale verktøy.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Mine faglærere har gitt meg opplæring i bruk av digitale verktøy.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Faglærere er gode rollemodeller for hvordan vi kan bruke digitale verktøy i undervisningen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har god innsikt i bruk av digitale verktøy for å fremme elevers læring.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har fått god trening i å bruke interaktiv tavle (f.eks. SmartBoard) i utdanningen på høgskolen/universitetet.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har fått god trening i å bruke interaktiv tavle (f.eks. SmartBoard) i praksisopplæringsperioder.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Praksisskolene forventer mer av min digitale kompetanse enn det utdanningen vektlegger.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kan bruke digitale verktøy for vurdering av elever.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har fått god innsikt i bruk av digitale	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
verktøy for administrativt arbeid i skolen.						
– Denne utdanningen har gitt meg god innsikt i etiske problemstillinger knyttet til skolens og elevers bruk av sosiale medier.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Opplæringen gjennom studiet

Samiske perspektiver

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
– Dette studiet har gitt meg dypere forståelse av hva en urbefolkning er.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Dette studiet har gitt meg god innsikt i utfordringer knyttet til det å være urbefolkning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Dette studiet har framhevet betydningen av samisk kultur og historie.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Dette studiet har gjort meg i stand til å ivareta samiske perspektiver i grunnskolens opplæring.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Opplæringen gjennom studiet

Flerkulturell undervisning

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
– Jeg kjenner til forskjeller mellom norsk som andrespråksundervisning og tospråklig opplæring.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kjenner til kommunens ansvarsområder overfor flerspråklige elever.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kjenner til de juridiske rettighetene til flerspråklige elever.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kjenner til metoder for å organisere undervisning i grupper hvor flere språk er til stede.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
kjenner til metoder som øker læringsmuligheter for flerspråklige elever.						
– Jeg kjenner til metoder som ivaretar elevers språk/religion/kultur som ressurs.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kan fremme elevers sensibilitet for betydningen av kulturelle forskjeller.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kan stimulere identitetsdannelsen til elever som ikke har norsk som sitt morsmål.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg vet hvordan jeg kan anvende alternative kunnskapssyn i klasserommet.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg vet hvordan jeg språklig kan legge til rette for læring i fag.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg kjenner til ulike verktøy for kartlegging av språkkompetanse.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg vet hvordan jeg kan samarbeide med morsmålslærere.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Opplæringen gjennom studiet

Skolen som system og samarbeid med andre parter

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
– Gjennom dette studiet har jeg fått god innsikt i arbeidet til PPT/PPR.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har ikke lært noe som helst om arbeidet til barnevernet i løpet av studietiden og praksisopplæring.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Gjennom dette studiet har jeg fått god innsikt i arbeidet til BUP.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Studiet har gitt meg god innsikt i hvordan utdanningssektoren styres nasjonalt og lokalt.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har hatt god nytte av nettstedet til Utdanningsdirektoratet i løpet av studietiden.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Dersom jeg ble spurt her og nå, ville jeg kunne forklare forskjellen på en Melding til Stortinget og en	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt

NOU.

Forskningsbasert undervisning

Under har vi listet opp en rekke påstander som gjelder forskningsbasert undervisning i studiet. På en skala fra 1 til 6, der 1 = Stemmer ikke i det helt tatt og 6 = Stemmer helt, vi vil at du skal markere det alternativet som best beskriver din oppfatning av hver påstand.

I hvor stor grad stemmer påstandene under med din oppfatning av forskningsbasert undervisning i studiet?

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
– Jeg har hatt forskningslitteratur på pensum som er skrevet av noen av mine forelesere.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Lærerne mine har fortalt om sin egen forskning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg vet at mange av mine lærere forsker på problemstillinger som er svært relevante for meg å lære mer om.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har fått tilbud om å delta i et forskningsprosjekt.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har selv utført forskning i klasserom eller på en skole.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg hadde ønsket at jeg hadde fått større mulighet til å bli involvert i forskning i løpet av studietiden.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Vi har hatt mange diskusjoner om ny forskning i alle fagene jeg har tatt.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg er i stand til å søke etter ny forskningslitteratur i internasjonale databaser som f.eks. ERIC og EBSCO.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har fått god trening i å lese engelskspråklige forskningsartikler.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har forsøkt å unngå å bruke engelskspråklige tekster som kilder i mine egne skriftlige oppgaver (skriftlige innleveringsoppgaver).	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg vil være i stand til å bruke observasjon som metode til å utvikle min egen praksis som	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Stemmer ikke i det hele tatt	2	3	4	5	6 Stemmer helt
lærer.						
– Jeg har fått god erfaring med forskningsmetoder som jeg vil ha bruk for som lærer.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Forskningen som jeg har møtt i mine studier vil hjelpe meg i undervisningen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Det er ikke relevant for meg som lærer at jeg har kunnskap om *kvantitative* forskningsmetoder.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Kunnskap om *kvalitative* forskningsmetoder er ikke relevant for lærere.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Profesjonalitet og profesjonsretting

Du skal snart begynne på arbeidet som lærer. Hvordan vil du vurdere dine egne ferdigheter, kunnskaper og muligheter til...

	1 Lite god	2	3	4	5	6 Veldig god
.... Å støtte elevers læring slik at de vil være i stand til å anvende kunnskap i nye situasjoner og på nye måter?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
.... Å støtte alle elever slik at de når ambisiøse læringsmål?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
... å utvikle læringsautonomi hos elever?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
... å kunne hindre at atferdsproblemer oppstår?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
... å kunne fremme positiv atferd i en elevgruppe?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
... å motivere foresatte til å delta i skolens aktiviteter?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
... å påvirke samarbeidsmiljøet blant kolleger?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
... å påvirke undervisningskvaliteten ved skolen?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Din profesjon

De følgende utsagn dreier seg om din profesjon som lærer. Kryss av det tallet som best uttrykker din uenighet/enighet om følgende påstander:

	1 Helt uenig	2	3	4	5	6 Helt enig
– Læreryrket er en ideell profesjon helt til pensjonsalderen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg tenker at jeg vil være lærer et par år og så prøve noe annet.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Hvis jeg kunne begynne på nytt, ville jeg ikke ha valgt lærerutdanning.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg har tenkt å studere videre etterpå og tar sikte på en doktorgrad (PhD).	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg tror jeg vil trives altfor godt som lærer til å slutte.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Hvis jeg kunne gå over til noe annet enn læreryrket og få samme lønn, ville jeg antakelig gjøre det.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg vil bestemt skape meg en karriere innenfor læreryrket.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Ditt arbeid som lærer

De følgende utsagn dreier seg om ditt arbeid som lærer. Velg det tallet som best uttrykker din uengihet/enighet om følgende påstander:

	1 Helt uenig	2	3	4	5	6 Helt enig
– Videreutdanning vil være viktig for at jeg skal trives og lykkes som lærer.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Etter mitt syn ville det være en fordel å gjøre videreutdanning for lærere obligatorisk.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Nå har jeg studert såpass mange år at det blir lenge til jeg vil ta en ny eksamen.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
– Jeg må finne arbeid på en skole hvor rektor forventer og støtter kollegabasert læring og utvikling.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Tusen takk for hjelpen!

Vennligst trykk "avslutt" for å lagre svarene dine.

Appendix 11: Questionnaire, mentor teachers

Spørreskjema for alle lærere som arbeider på en praksisskole som tar i mot grunnskolelærerstudenter

Følgegruppen for lærerutdanningsreformen er oppnevnt av Kunnskapsdepartementet til å følge innføringen av grunnskolelærerutdanningene. En av våre hovedoppgaver er å samle, analysere og gjøre kjent data om reformen.

Dette er en spørreundersøkelse som sendes ut til alle lærere som arbeider på en praksisskole som tar imot grunnskolelærerstudenter. Undersøkelsen er en del av Følgegruppens siste datainnsamling, og resultatene vil inngå i rapportering til KD og lærerutdanningsinstitusjonene våren 2015. Alle lærerutdanningsinstitusjoner som deltar vil få innsikt i egne resultater, men detaljeringsgraden av dette vil være avhengig av svarprosenten/antall deltakere. Alle som svarer på undersøkelsen skal være sikre på at anonymitet ivaretas, derfor vil noen analyser kun bli gjort på storgruppenivå på tvers av alle eller grupper av institusjoner for å sikre stor nok N (antall deltakere). Det er frivillig å delta i undersøkelsen, og det er mulig å trekke seg underveis eller la være å svare på enkelte spørsmål.

Vi håper at du vil finne undersøkelsen interessant, og at du vil bruke litt tid (ca. 10- 15 minutter) på å svare på spørsmålene som følger.

Bakgrunn

Kjønn

Jeg er...

(1) ❑ Mann
(2) ❑ Kvinne

Jeg er født i ...
(oppgi fødselsår - 4 år)

_____

Bakgrunn

Sett kryss ved den <u>grunnutdanningen</u> som best beskriver din utdanningsbakgrunn:

(1) ❑ Førskolelærer
(2) ❑ Allmenn-/grunnskolelærer
(3) ❑ Faglærer
(4) ❑ PPU

Hvor mange års utdanning totalt sett har du fra høgskole/ universitet?
(For eksempel 3-årig allmennlærer + 2 grunnfag = 5 år)

_____

Bakgrunn

Har du fullført hovedfag/mastergrad?

(1) ❑ Ja
(2) ❑ Nei

Bakgrunn

Jeg er ansatt på følgende skole:
(navn på skolen)

_____

Hvilken høgskole/universitet har din skole en praksisskoleavtale med?

(1) ❑ Høgskolen i Bergen
(2) ❑ Høgskolen i Buskerud og Vestfold (Campus Drammen)
(3) ❑ Høgskolen i Buskerud og Vestfold (Campus Vestfold)
(4) ❑ Høgskolen i Hedmark
(5) ❑ Høgskolen i Nesna
(6) ❑ Høgskolen i Nord-Trøndelag
(7) ❑ Høgskolen i Oslo og Akershus
(8) ❑ Høgskolen i Sogn og Fjordane
(9) ❑ Høgskolen i Stord/Haugesund
(10) ❑ Høgskolen i Sør-Trøndelag
(11) ❑ Høgskolen i Telemark
(12) ❑ Høgskolen i Volda
(13) ❑ Høgskolen i Østfold
(14) ❑ NLA Høgskolen
(15) ❑ Universitetet i Agder
(16) ❑ Universitetet i Nordland
(17) ❑ Universitetet i Stavanger
(18) ❑ Universitetet i Tromsø (Campus Alta)
(19) ❑ Universitetet i Tromsø (Campus Tromsø)
(20) ❑ Samisk Høgskole

Bakgrunn

Hvilket klassetrinn har du flest undervisningstimer på?
Dersom du har like mange timer på flere av alternativene, kan du krysse av for flere.
(Trinn jeg underviser mest på:)

(1) ❑ 1-2
(2) ❑ 3-4
(3) ❑ 5-7
(4) ❑ 8-10

Totalt antall år du har jobbet som lærer i grunnskolen
Antall år (rund av til nærmeste hele år):

_____

Fag

Har du formell kompetanse i de fagene du underviser i?
Lærerutdanningene har behov for kunnskap om hvilke fag det vil være bruk for i skolene i framtiden. Vi ber deg derfor om å krysse av for om du har formell kompetanse i de fagene som du selv underviser i dette studieåret (2013-2014). Svar kun for de fagene som du underviser i. Formell kvalifisering=minimum 30 studiepoeng eller tilsvarende 1/2-årsstudium.

	Ja	Nei
Norsk	(1) ❑	(2) ❑
Norsk som andrespråk	(1) ❑	(2) ❑
Engelsk	(1) ❑	(2) ❑
Tysk, spansk, fransk eller andre fremmedspråk	(1) ❑	(2) ❑
Matematikk	(1) ❑	(2) ❑
Natur og Miljø	(1) ❑	(2) ❑
Samfunnsfag	(1) ❑	(2) ❑
RLE	(1) ❑	(2) ❑
Kunst & Håndverk	(1) ❑	(2) ❑
Kroppsøving/Friluft	(1) ❑	(2) ❑
Mat & Helse	(1) ❑	(2) ❑
Musikk	(1) ❑	(2) ❑
Annet	(1) ❑	(2) ❑

Å være lærer - undervisning og læring

I det som nå følger, spør vi en del om hvordan du opplever det å være lærer.

Når du svarer på spørsmålene, ber vi deg om å tenke på den elevgruppen du har flest timer sammen med. Dersom du har like mange timer sammen med flere grupper, ber vi deg om å velge èn av disse gruppene som du svarer ut fra.

Vennligst velg det alternativet som best angir ditt svar.

	1 Aldri	2	3	4	5	6 Svært ofte
- Mine elever er klar over	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Aldri	2	3	4	5	6 Svært ofte
læringsmål for min undervisning						
- Elever er med på å sette læringsmål for arbeidet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Elevene arbeider i forhold til arbeidsplaner/ukeplaner	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg følger opp og veileder elevene aktivt på hvordan samarbeide i grupper	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg arbeider bevisst med at elevene må selv stille spørsmål om det emnet de skal lære	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg arbeider bevisst med å utvikle min egen tilbakemelding til elever slik at tilbakemeldingen blir læringsfremmende	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg sørger for at elevene har nok tid til å gå i dybden på viktige emner	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Å være lærer - arbeidsmiljø

Vennligst velg det alternativet som best angir ditt svar.
Jeg deltar i samarbeid med kollegaer hvor:

	1 Aldri	2	3	4	5	6 Svært ofte
...vi bruker mye tid på å planlegge undervisning sammen	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...vi utvikler undervisningsmateriell sammen	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...vi gjennomfører undervisning sammen	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...vi observerer hverandres undervisning for å studere elevers læring	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...vi deltar i kollegaveiledning	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...vi samarbeider om elevvurdering	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...vi diskuterer vår egen undervisning og pedagogisk praksis	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...vi diskuterer litteratur som vi har lest om undervisning og pedagogisk praksis	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...vi arbeider på tvers av fag	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...vi arbeider på tvers av trinn	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Aldri	2	3	4	5	6 Svært ofte
...vi drøfter profesjonsetiske problemstillinger som vi opplever i hverdagen	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...vi drøfter den profesjonsetiske plattformen som er utarbeidet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...jeg er godt kjent med den profesjonsetiske plattformen	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...vi diskuterer forskningslitteratur som er relevant for vår praksis	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...vi samarbeider om utviklingsprosjekter for å bedre vår egen praksis	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Om å være praksisskole

Vennligst velg det alternativet som best angir ditt svar.

	1 Helt uenig	2	3	4	5	6 Helt enig
- Lærerstudentene som kommer hit til praksisopplæring oppleves som en ressurs på denne skolen	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Vi lærer mye av å være praksisskole	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Det er en påkjenning for elevene å ha så mange studenter på skolen	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Elevene lærer mindre når de har lærerstudenter i praksis	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Elevene blir mer urolige når vi har lærerstudenter i praksis	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Å være praksisskole er et kollektivt ansvar hos oss	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Hele lærerkollegiet på denne skolen er engasjert i forarbeid til praksisperioder	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Hele lærerkollegiet på denne skolen får god informasjon før hver praksisperiode	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Studenter bruker denne skolen som studie- og utforskingsarena også utenom de avtalte praksisperiodene.	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Hele kollegiet drøfter hva det vil si å være praksisskole	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Helt uenig	2	3	4	5	6 Helt enig
- Hele kollegiet drøfter hvordan vi fungerer som rollemodeller for studentene	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Denne skolen deltar i FoU-samarbeid med høgskolen/universitetet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Profesjonell identitet

Som ansatt i grunnskolen og som ansatt på en praksisskole har du flere roller å fylle. Tre sentrale roller er: fagperson (dvs disiplin eller fagorientert) – lærer (for elever)– lærerutdanner (for studenter). I det som følger ber vi deg oppgi i hvor stor grad din profesjonelle identitet er knyttet til disse rollene.

Min profesjonelle identitet er knyttet til å være:

	1 Ikke i det hele tatt	2	3	4	5	6 I stor grad
Fagperson	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Lærer (for elever)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Lærerutdanner (for studenter)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Praksislærer

Har du noen gang vært praksislærer for lærerstudenter?

(1) ❑ Ja
(2) ❑ Nei

Var du praksislærer for lærerstudenter studieåret 2013-2014?

(1) ❑ Ja
(2) ❑ Nei

Praksislærer

Dersom du svarte JA på det siste spørsmålet, ber vi deg om å svare på spørsmålene som følger om det å være praksislærer.

I 2013-2014 hadde jeg studenter som var i følgende studieår:

(1) ❑ 1.året
(2) ❑ 2.året
(3) ❑ 3.året
(4) ❑ 4.året
(5) ❑ 5.året

Å være praksislærer

Antall års erfaring som lærer for lærerstudenter/praksislærer:
Antall år (rund av til nærmeste hele tall)

_____

Å være praksislærer

Her er noen spørsmål knyttet til hvorfor du valgte å bli praksislærer.
Vennligst velg det alternativet som best angir ditt svar.

	1 Helt uenig	2	3	4	5	6 Helt enig
- Jeg har valgt å bli praksislærer først og fremst fordi det har positiv betydning for mine elever	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg har valgt å bli praksislærer fordi min rektor/ledelsen ba meg om det	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg har valgt å bli praksislærer fordi det er viktig for min egen utvikling som lærer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg har utdanning som veileder og ønsker å bruke denne kunnskapen	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Å være praksislærer er et viktig arbeid	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Å være praksislærer gir status på denne skolen	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg har valgt å bli praksislærer fordi jeg liker å bidra til studenters forståelse av det å være lærer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Forberedelse til praksisperioder

Vennligst velg det alternativet som best angir ditt svar.

	1 Helt uenig	2	3	4	5	6 Helt enig
- Høgskolen/universitetet forbereder studentenes praksisopphold på en god måte	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg planlegger praksisperioder sammen med ansatte i lærerutdanningen	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg er godt kjent med praksisplanen utarbeidet ved lærerutdanningen som vi samarbeider med	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Læringsutbytteformuleringene for praksisopplæringsperiodene har stor betydning for hvordan jeg planlegger	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Helt uenig	2	3	4	5	6 Helt enig
studentenes opplæring						
- Læringsutbytteformuleringene gir gode rammer for vurdering av studentenes kunnskap og ferdigheter som lærer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg kjenner til læringsutbytteformuleringene for studentene i de fagene som de studerer i utdanningen	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Gjennomføring av praksis

Vennligst velg det alternativet som best angir ditt svar.

	1 Helt uenig	2	3	4	5	6 Helt enig
- Lærere fra høgskole/universitet er for lite til stede i studentenes praksisperioder	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Faglærere fra høgskole/universitetet bidrar til utforsking av faglige spørsmål sammen med studentene og meg mens studentene er i praksisopplæring	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Lærere fra høgskole/universitet gir meg god støtte i arbeidet som praksislærer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg møter knapt studentenes lærere på høgskolen/universitetet i løpet av praksisperiodene	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Ledelsen på min skole følger opp arbeidet mitt som praksislærer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- På min skole har lærerteamet på trinnet ansvar for studentenes praksis	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg får god støtte på denne skolen i arbeidet mitt som praksislærer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- På min skole tar ledelsen aktivt del i studentenes praksisopplæring	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Studentene får praksis i de fagene som de studerer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Det er umulig for oss å vektlegge studentenes fagvalg i praksisopplæringen	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Veiledning i praksisopplæring

Vennligst velg det alternativet som best angir ditt svar.

	1 Aldri	2	3	4	5	6 Svært ofte
- Det er lærerstudentene som bestemmer tema i veiledningssamtalene	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Lærerstudentene og jeg avklarer våre forventninger til veiledningssamtalene før møtet tar til	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg forholder meg til læringsutbyttene for praksisperioden når jeg planlegger tema for veiledning	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Vi kommer fram til tema for veiledningssamtalene i fellesskap	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Lærerstudentene viser god evne til kritisk refleksjon over praksis	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg lærer mye av veiledningssamtalene våre	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- I veiledningssamtalene, er studentene opptatt av spørsmål om faget det undervises i	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Studentene er opptatt av elevers sosiale relasjoner i veiledningssamtalene	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- I veiledningssamtalene, er studentene opptatt av å utforske ulike undervisningsmetoder i forhold til elevers læring	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Studentene refererer til ulike teorier de har lært om i løpet av studiene når vi har veiledningssamtaler	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Studentene viser god innsikt i fagene som de får undervise i	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
Studentene viser god innsikt i forskning om undervisning som fremmer læring	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg knytter observasjoner til teori i løpet av veiledningssamtaler med studenter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Vurdering

Vennligst velg det alternativet som best angir ditt svar.

	1 Helt uenig	2	3	4	5	6 Helt enig
- Jeg står ganske alene når det gjelder vurdering av lærerstudenter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Praksislærerne på denne skolen samarbeider om vurdering av lærerstudenter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Vi legger mye arbeid i vurdering av studentene	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Vi samarbeider med høgskolen/universitetet om vurdering av lærerstudenter i praksis	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Høgskolen/universitetet tar ikke hensyn til våre bekymringsmeldinger om studenter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Skikkethetsvurdering

Vennligst velg det alternativet som best angir ditt svar.

	1 Helt uenig	2	3	4	5	6 Helt enig
- Jeg har god kjennskap til forskriften om skikkethetsvurdering	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg samarbeider godt med høgskolen/universitetet i f.t. skikkethetsvurdering	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg har fått opplæring i skikkethetsvurdering av høgskolen/universitetet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Etterarbeid

Vennligst velg det alternativet som best angir ditt svar.

	1 Helt uenig	2	3	4	5	6 Helt enig
- Høgskolen/universitetet etterspør mine erfaringer med studentenes praksisopplæring	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Høgskolen/universitetet tar hensyn til mine erfaringer med praksisopplæring	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Helt uenig	2	3	4	5	6 Helt enig
- Jeg er med på å videreutvikle praksisopplæring i samarbeid med høgskolen/universitetet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Innhold i praksisopplæring

I løpet av praksisperiodene, hvor mye trening eller øvelse får studentene i..

	1 Ingen	2	3	4	5	6 Svært mye
... læreplananalyse	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
... planlegging av lengre perioder	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...planlegging av enkeltøkter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
... å utvikle læringsmål for enkeltøkter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
... å undervise elevgrupper/klasser på egenhånd	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...å håndtere konflikter blant elever	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...å gjennomføre elevsamtaler	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...å observere eller gjennomføre foreldresamtaler	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...å vurdere skolens planer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...å identifisere, analysere og håndtere profesjonsetiske dilemmaer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
... å observere og drøfte din undervisning	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...å observere og vurdere elevers samarbeid	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...å observere undervisning og vurdere denne kritisk i forhold til elevers læring	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...å observere undervisning og vurdere denne kritisk i forhold til undervisningsmetoder	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...å håndtere uønsket elevatferd	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...å prøve ut og vurdere ulike undervisningsmetoder	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Ingen	2	3	4	5	6 Svært mye
...å lede faglige samtaler med enkeltelever eller en elevgruppe	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
...å tolke testresultater	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Grunnleggende ferdigheter

Vennligst velg det alternativet som best angir ditt svar.

	1 Helt uenig	2	3	4	5	6 Svært enig
- Jeg har kunnskap om teorier innen leseopplæring, med særlig vekt på begynneropplæringen (GLU 1-7 studenter)/videre leseopplæring (GLU 5-10 studenter)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg har kunnskap om leseforståelse	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg har kunnskap om flerspråklighet, flerspråklig praksis og om det å lære norsk som andrespråk	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg har kunnskap om hvordan lesevansker kan forebygges	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg sørger for at lærerstudentene arbeider med lesing som grunnleggende ferdighet i alle fag jeg har	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Studentene får øvelse i relevante tiltak for å styrke elevers skriveferdigheter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Studentene lærer hvordan de kan bruke regning for å styrke elevers læring i alle fagene som jeg har	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Lærerstudentene får øvelse i hvordan de kan fremme elevenes ferdigheter til å ta del i og føre diskusjoner	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Studentene lærer hvordan de kan bruke muntlige ferdigheter til å styrke elevenes læring i alle fagene	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg har god innsikt i bruk av digitale verktøy for å fremme elevers læring	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Studentene får god trening i å bruke interaktiv tavle (f.eks. SmartBoard) i løpet av praksisopplæringsperioder	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg forventer mer av studentenes digitale kompetanse enn det utdanningen vektlegger	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg tar opp etiske problemstillinger knyttet	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Helt uenig	2	3	4	5	6 Svært enig
til skolens og elevers bruk av sosiale medier med studentene						
- Jeg bruker digitale verktøy i vurdering av elever	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Flerkulturelle perspektiv

Vi ber deg om å velge det alternativet som best angir ditt svar.

	1 Helt uenig	2	3	4	5	6 Svært enig
- Når studenter har praksisopplæring på denne skolen, får de god opplæring i hva det vil si å arbeide i flerkulturelle og flerspråklige klasser	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Studenter lærer metoder for å organisere undervisning i grupper hvor flere språk er til stede	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Studenter får kjennskap til metoder som øker læringsmuligheter for flerspråklige elever	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Studenter får prøve ut undervisning som ivaretar elevers språk/religion/kultur som ressurs	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Studenter får erfare kartleggingsverktøy for å kartlegge språkvansker	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Studenter får erfaring med samarbeid med morsmålslærere	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

FoU-arbeid

Vi ber deg om å velge det alternativet som best angir ditt svar.

	1 Helt uenig	2	3	4	5	6 Svært enig
- Jeg vektlegger at studentene skal anvende teoretiske perspektiver når de planlegger undervisning	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg sørger for at studentene utvikler evne til å observere klasseromsinteraksjon	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg sørger for at studentene utvikler evne til å analysere klasseromssituasjoner	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

	1 Helt uenig	2	3	4	5	6 Svært enig
- Jeg sørger for at studentene anvender observasjoner og analyser i deres planlegging av læringsøkter	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg samarbeider med faglærere på høgskolen/universitetet om FoU-arbeid	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg utfører mindre undersøkelser i klasserommet sammen med studentene	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg vektlegger nyere forskning i mine veiledningsøkter med studentene	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
- Jeg må holde meg oppdatert faglig for å utføre mitt arbeid som lærer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Nyutdannede lærere

Basert på din erfaring (selv om du er nytilsatt), hvor stor del av nyutdannede lærere vil du si...

	1 Ingen	2	3	4	5	6 Alle
...klarer overgangen til læreryrket på en utmerket måte, så å si ingen problemer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
... har moderate problemer med overgangen, litt problemer – men ikke store problemer	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑
... har store problemer med overgangen	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑

Tusen takk for hjelpen!

Vennligst trykk "avslutt" for å lagre undersøkelsen.