New teachers' digital competence and experiences of ICT in teacher education programmes in Norway

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Abstract
Teacher education plays a key role in assisting teachers to develop a realistic understanding of their profession. In Norway, information and communication technology (ICT) is a prioritized area in the national curriculum and Norwegian schools have very good access to ICT. Additionally, digital competence is considered one of five key competences that is integrated with subject knowledge and that all students are expected to achieve in their compulsory education.

This paper presents data from a nationwide survey of 356 new teachers concerning the use of ICT in teacher education programmes and how well prepared new teachers consider themselves to be to use ICT at the start of their careers. The findings showed that new teachers are critical of the lack of emphasis on ICT and digital competence in teacher education programmes. Furthermore, new teachers experience discrepancies between the expectations and actual demands of their profession when they start teaching. This is challenging as early experiences of new teachers are crucial in determining their attitudes towards their profession, their professional development, their classroom practices and, not least, their endurance in the profession.

Introduction
The way in which we treat and interact with ICT has changed considerably over the past decades. For many of us, our everyday lives involve considerable use of information and communication technology (ICT) both at work and at home. The rapid emergence of the Internet and mobile technology has lead to these tools becoming important components of our participation in society, life and work, and how we produce, communicate, search for and make use of information.

Similarly, access to digital tools and media has increased among learners and teachers across all spheres of life. This is reflected in the fact that, for example, interactive whiteboards can now be found in the majority of Norwegian classrooms (Dalaaker et al., 2012). Indeed, the importance of possessing good digital judgement and showing digital responsibility is becoming more and more significant due to increased access to information. Digital technology and networks have in that respect become a natural part of everyday life and are changing how we communicate, express ourselves and engage with learning (Vasbø & Gudmundsdottir, 2014). The integration of digital competence in the context of education has also generated interest in the relationship between school-
learning and working life, and how this relationship is linked to essential skills in life-long learning.

Norwegian schools have good access to digital tools and the Internet compared with other countries. Yet Norwegian teachers are mediocre when it comes to pedagogic use of ICT in schools (European Commission, 2013a). When teachers were asked about their needs for professional development, the Teaching and Learning International Survey (TALIS) showed that the second and third most needed areas are ICT skills for teaching and using new technologies in the workplace (Organisation for Economic Co-operation and Development [OECD], 2014).

Competence aims connected to the various uses of ICT are defined by the national curriculum (Norwegian Directorate for Education and Training, 2014). Parents and learners expect schools to help them achieve these aims. Similarly, teacher education programmes are expected to support the professional digital competence of student teachers and to prepare them to use ICT in their future careers. Accordingly, student teachers should be able to develop the basic digital competence of learners and to assess which digital tools are the most appropriate for use in their own teaching. Curricular demands also imply that student teachers should learn to use ICT for administrative tasks, evaluation and their own competence development, as well as to collaborate and communicate with and convey information to learners and colleagues (Tømte, Kårstein, & Olsen, 2013).

Bearing this in mind, this paper aims to explore the following research questions:

1) How do newly qualified teachers view their professional digital competence and, accordingly, their need for continuous professional development?

2) How has teacher education prepared newly qualified teachers to use ICT in their capacity as teachers?

These research questions are linked to a need to explore how professional digital competence is dealt with in teacher education programmes and to identify areas of improvement.

The data material in this study was based on a survey which is a part of an initiative to enhance the pedagogic use of ICT in teacher education and to put digital competence on the agenda within teacher education programmes. As part of this initiative we recognize the need to increase awareness of digital competence within teacher education programmes as well as to provide newly qualified teachers with guidelines on the direction in which to develop their professional digital competence. Other studies (Egeberg et al., 2012; Hattie, 2009; Krumsvik, Egelandsal, Sarastuen, Jones, & Eikeland, 2013) have considered the link between the digital competence of teachers and the learning outcomes among learners. Based on the findings of these studies, we reason that contributing to the development of professional digital competence among newly qualified teachers can be an important aspect in improving learning outcomes, promoting better learning strategies and developing relevant teaching methods.

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This paper is structured as follows: After the introduction we take a brief look at key perspectives which are of relevance in understanding professional digital competence and ICT use in schools. Thereafter, we give an account of the methods used for collecting the empirical data for the study. We then present the results of the study and discuss some of the findings. The paper concludes with a suggestions for further research.

Frameworks of digital competence

In Norway, digital competence in schools has been on the national agenda for decades but it was not until the Knowledge Promotion Reform in 2006 (Ministry of Education and Research, 2014) that digital skills became one of the basic competences, meaning that digital skills must be an integrated part of every subject at every stage. In White Paper No. 31, *Quality in Schools*, it is stated that, with the introduction of basic skills, “further education in subjects must include elements concerning how ICT can be integrated in subjects” (Ministry of Education and Research, 2007–2008, p. 67). As a result, digital competence needs to form a significant part of actual teacher education programmes as well as the continuous professional development (CPD) process.

As an extension of the Norwegian Education Reform of 2006, a framework for basic competences was developed. This framework was originally prepared as a supporting tool in the revision of the national curriculum in various subjects. However, it has frequently been used by teachers and school leaders who want a clearer understanding of how digital competences are to be adapted to different grades in schools (Gudmundsdottir & Egeberg, 2014). The framework for basic competence includes a progression in skills and is operationalized on the basis of four competence areas: *search and process, produce, communicate* and finally *digital judgement* (Norwegian Directorate for Education and Training, 2012). According to the framework, these are the fundamental aspects of digital competence which all teachers in Norway should incorporate into their teaching practices.

Teachers’ “professional digital competence” is a term that is used in different ways in different contexts. Ferrari is one of the international researchers who published a comprehensive overview of various frameworks on digital competence (Ferrari, 2013). She attempted to identify common characteristics and contribute to agreement concerning a holistic framework for digital competence. The aim was a better understanding of what digital competence is and how it has developed in different European countries. Ferrari’s approach was based on summarizing a number of European frameworks, analyzing governing documents and interviewing various experts and stakeholders. Ferrari concluded by presenting a framework consisting of five categories. In addition to information, communication, production and digital safety, which are recognizable aspects of the Norwegian framework for basic skills (Norwegian Directorate for Education and Training, 2012), she included problem-solving as a fifth category (Ferrari, 2013). This framework represents an important starting point for defining the term “professional digital competence” and how digital competence can be used in teacher education.

The United Nations Educational, Scientific and Cultural Organization’s (UNESCO) framework for the ICT competence of teachers is another framework that describes

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1 Called “skill” in the reform but defined as a broader competence. In this paper we use the term competence.
teachers’ digital competence and how it is developed. With the aid of a matrix, the framework illustrates a number of aspects which are linked to and influence teachers’ professional digital competence or the use of ICT in their own work. These are: (a) policy formulation and framework, (b) curriculum and evaluation, (c) pedagogy, (d) competence and skills, (e) learning environments and administration, and (f) self-development and professional understanding. The matrix also shows a three-stage progression within all these areas. It can therefore be said that the use of ICT for learning and teaching will involve an altered teacher role and pedagogic approach in teacher education. In UNESCO’s framework it is furthermore stated that:

The successful integration of ICT into the classroom will depend on the ability of teachers to structure the learning environment in new ways, to merge new technology with a new pedagogy, to develop socially active classrooms, encouraging co-operative interaction, collaborative learning and group work. This requires a different set of classroom management skills. The teaching skills of the future will include the ability to develop innovative ways of using technology to enhance the learning environment, and to encourage technology literacy, knowledge deepening and knowledge creation. (UNESCO, 2011, p. 8)

The International Society for Technology in Education (ISTE) also identified a number of preconditions for teacher training courses and schools to enable newly qualified teachers to use ICT appropriately in their work. These preconditions are: a shared ICT vision, access to digital tools, competent teachers, professional development, technical support, content standards and digital subject resources, learner-centred teaching, support from a professional environment and, finally, clear policy guidelines and supporting documents (Clausen, 2007, p. 247). These aspects point to a number of areas supporting new teachers in their development as professionals with ICT as a central feature.

**Professional digital competence in Norway**

Professional digital competence is a complex skill which is dependent on both external and internal factors. It links digital competence to the profession of teaching and didactic practice within different subjects but it is also strongly interwoven with the frameworks that teachers are given in order to practise their profession.

A systematic review of Norwegian general teacher education from 2000 to 2010 found that many of the studies regarding teacher education and student teachers explored the use of ICT as a facilitator in the professional development of student teachers. The review showed that there is an awareness of ICT in the professional development of teachers in Norway (Haugan, 2011). However – and despite this awareness – a report from the Nordic Institute for Studies on Innovation, Research and Education (NIFU) dating from 2013 concluded that initiatives relating to ICT use and competence development in teacher education are fragmented and poorly supported by the leadership in teacher education institutions. The development of professional digital competence is often driven by pioneers and there is a general lack of competence development among those working within teacher education (Tømte, Kårstein, & Olsen, 2013).
In the NIFU report, professional digital competence was defined by linking the use of ICT by teachers to prepare lesson plans, using ICT in a pedagogic way in their own teaching and using ICT for administrative tasks, evaluation and research purposes (Tømte et al., 2013). After considering other frameworks linked to teacher education, it is evident that a number of aspects can be added when defining the term “professional digital competence”. The aspects that Tømte et al. (2013) referred to are aimed at teachers themselves but do not include external factors such as teaching environments, teaching plans and policy formulations or attitude-related aspects such as self-awareness and interpersonal skills (Nordenbo, Larsen, Tiftikçi, Wendt, & Østergaard, 2008).

In addition, it appears to be a contradiction that the latest teacher education reform (Ministry of Education and Research, 2010) and the regulations concerning teacher education in Norway emphasize digital competence as one of the basic competences yet student teachers have limited possibilities for specialization in interdisciplinary subjects involving ICT or digital competence. The fostering of digital competence is embedded in traditional subjects such as Norwegian, English and mathematics, and it is up to subject teachers whether or not they prioritize the pedagogic use of ICT in their subjects. In this context, Engen, Giæver and Mifsud (2014) asked whether the structure of the present teacher education programme has in reality limited opportunities to develop professional digital competence viewed against the expectations that schools have of newly qualified teachers. On the basis of this discussion we aim to highlight the professional digital competence of teachers and how teacher education programmes prepare teachers to use ICT in their profession.

Methodology

Sample size
This study focused on newly qualified teachers. In this regard, we defined “newly qualified teachers” as teachers who have been teaching for up to two years. This means that they graduated less than two years previously and should therefore be able to reflect on how their teacher education has influenced and contributed to their professional digital competence and the use of ICT in the practising of their profession.

According to the official database concerning higher education in Norway (DSB NBH), a total of 2,077 students graduated with general, primary and lower secondary school teacher education during the period 2011–2012 (Norwegian Social Science Data Services, 2014). According to the primary and lower secondary schools’ information system (Norwegian Directorate for Education and Training, 2014), as of June 2013 there were 3,116 primary and lower secondary schools in Norway in the study’s target group. Figures for the distribution of newly qualified primary and lower secondary school teachers across schools tentatively indicated an average of 0.6 newly appointed teachers per school if all schools had made such appointments, or 1.2 teachers per school if only half of the schools had newly appointed teachers. By taking teachers from a random nationwide sample of schools, it was assumed that these provided a good spread of graduate teachers from the country’s various teacher education institutions.
Data collection
A draft digital questionnaire was created by the Centre for ICT in Education and finalized for interview purposes in collaboration with TNS Gallup Norway. The effective answering time was about 10 minutes. Telephone interviews in the concluding data acquisition phase required a verbal version of the instrument. The use of written and verbal interviews could have led to different answers to the same questions, partly because the answer scales were visible/invisible to respondents during interviews and partly because telephone interviews can have an “interviewer effect”.

The desired net sample consisted of around 1,000 newly qualified teachers, representative of Norwegian educational institutions. It was assumed in advance that a gross sample of 2,000 randomly selected schools would give a net total of around 1,000 schools and a gross total of 1,500 teachers’ addresses (with a school response rate of 50%). Assuming that two-thirds of teachers would answer the questionnaire, this would have given a net sample of approximately 1,000 newly qualified teachers. The recruitment phase of the study carried out among schools and teachers comprised two components. Principals of 1,000 primary, lower secondary and upper secondary schools were initially contacted via e-mail and asked to identify newly qualified teachers and provide the teachers’ e-mail addresses to TNS Gallup. Due to a relatively low response rate to the electronic communication, telephone calls were made to the schools that had not replied. Upon conclusion of the recruitment phase, 581 schools had returned a total of 1,016 teachers’ addresses.

The teachers’ questionnaire was distributed based on the e-mail addresses that had been obtained. Following the dispatch of the questionnaire to a total of 925 valid addresses in early November 2013, only 157 answers were received. To increase the response rate further, telephone calls were made to 703 teachers who were identified by name via their e-mail addresses and linked to their schools’ telephone numbers.

Upon conclusion of the data collection phase, we received responses from a total of 375 teachers. In this report, we chose to ignore responses from 19 newly qualified teachers who were working at an upper secondary school. As a result, the underlying data presented is based on 356 responses.

Teachers’ professional digital competence
When considering the first research question: “How do newly qualified teachers view their professional digital competence and, accordingly, their need for continuous professional development?” questions concerning teachers’ self-reported skills and their self-reported needs for CPD were utilized.

Despite having graduated recently, the great majority of the teachers (79%) answered that they needed to develop or refresh their ICT knowledge and digital competence in their work as teachers. This was an interesting finding when we compared it to the answers to the question about the teachers’ operational ICT skills, which was stated as: “To what extent can you perform these tasks when you use ICT”?

The teachers were asked to assess their operational skills on a scale comprising “unable to perform”, “able to perform with a little help” or “able to perform without help”. Their answers are presented in Figure 1.
Most teachers responded that they could carry out the various procedures without help (Figure 1). All the teachers said that they could create a presentation with text and images in PowerPoint, for example, and 99% said that they could search for relevant information for teaching purposes, e.g. on the Internet, without help. Using the Internet appropriately and downloading and installing programs were also tasks that 90% and 89% of teachers, respectively, said they could do without assistance. They were somewhat less certain with regard to the use of social media together with learners in group tasks, although 77% believed that they could use social media without assistance. They were even more uncertain with respect to the editing of digital photographs (68% said they could perform this task without assistance) and using spreadsheets to draw graphs (58% said they could do this without help). Using collaborative editing tools online, such as Wiki or Google Docs, was the task that the largest proportion of teachers were uncertain about. Although 48% said they could do this without help, 25% said that they could not, while 28% felt they needed a little help to do this.

Despite these positive findings it is important to remember that the teachers' subject specializations, the grades taught and the academic specializations of the respondents may have influenced the responses. For example, a mathematics teacher would find it easier to draw a graph in a spreadsheet than an English teacher or a music teacher. It is also possible that an art and crafts teacher would have better skills in the use of editing/graphic tools than teachers of other subjects. The composition of the group may therefore have impacted the results. The items chosen were all examples of tasks and competence goals from the national curriculum in different subjects. This means that
learners are supposed to be able to conduct these tasks “without help” and one may assume that their teachers would be able to perform the same tasks. However, knowing different programs is not the same as being able to integrate and use them to enhance learners’ learning. This may explain the teachers’ reported need for continuous professional development in the field of ICT.

The newly qualified teachers were also asked about their attitudes towards the use of ICT in their teaching. The questions and the answers from the teaches are presented in Figure 2.

![Figure 2](image-url)

**Figure 2. Teachers’ perceptions of the opportunities provided by using different ICTs in teaching. Responses to the question: “To what extent do you agree or disagree with the following statements concerning the opportunities presented by the use of ICT in teaching?”**

The distribution of the responses indicated that the teachers in the sample were quite positive towards the use of ICT in their teaching (Figure 2). A total of 97% agreed (entirely or partly) that ICT helped them to variate their teaching. The fact that they used ICT to make learners more interested in a subject was also cited as an important reason they used ICT in their teaching. Of all the teachers in the survey, 95% either entirely or partly agreed with this. A total of 89% also claimed that ICT made it easier to engage and motivate learners. Being able to use ICT to differentiate teaching between learners also seemed to be a common perception amongst the teachers and 86% replied...
that they agreed with this. Somewhat fewer, 62%, answered that ICT made it easier to get learners to collaborate.

Considering the second research question “How has teacher education prepared newly qualified teachers to use ICT in their capacity as teachers?” the teachers were asked several questions to assess their use and perceived expectations of ICT as well as their preferences with respect to CPD. The questions and answers from the teachers are presented in Figure 3.

When asked about whether their schools focused on digital competence, 69% of the teachers agreed with the statement to a great or fairly great extent. The teachers were also asked to assess the link between the ICT emphasis in their teacher education and the expectations regarding ICT imposed on them in their profession. A high proportion of teachers (76%) replied that there was only some or very little correlation between the ICT emphasis in teacher education and the expectations imposed on them regarding the use of ICT in their profession. This could partly be the result of differing priorities in teacher education programmes and in practice. Teachers encountered widely varying conditions regarding the use of ICT in schools. In previous research, digital divides between the provision of digital equipment and digital learning resources in schools were apparent. There may also be variations in the emphasis placed on digital competence by the educational institutions that student teachers have attended.

Although the teachers in this study found that teacher education did not properly address the use of ICT in the teaching profession, the numbers in Figure 3 indicate that
they were still able to meet the ICT demands imposed on them on a daily basis. A total of 81% of the teachers said that they either entirely or partly agreed that they were able to meet the expectations of their schools when it came to the use of ICT in teaching. Most teachers also believed that they were able to meet the demands imposed on them by the curriculum (74%).

Although many teachers said they did not experience any particular difficulties meeting the expectations imposed on them by their schools or curriculums concerning the use of ICT in teaching (Figure 3), they were additionally asked about their need to develop their own digital competence. A high proportion, or 79%, claimed that they needed to develop their own digital competence. This indicated not only that the teachers wanted more training, but also that the need for training did not adversely affect their ability to cope on a day-to-day basis in the classroom. We also included questions concerning the form of training the teachers would prefer to improve their competence, and 60% said they would like to attend either external or internal courses. One out of four teachers preferred systematic mentoring by a colleague, and 9% indicated a preference for self-study. Only 1% of the respondents answered that they did not need to develop their digital competence further.

We asked the teachers about a number of different aspects regarding their teacher education and the use of ICT in teaching. In general the teachers were critical of their teacher education with regard to aspects of ICT use. The aspect they were most satisfied with was training concerning the production of multimodal texts. Less than half of the teachers, or 44%, were satisfied with the training in this respect. When it came to the expansion of their own skills in the use of ICT tools, 37% of the teachers responded that they had received fairly good or very good training and 38% answered in similar terms when asked about training in good search strategies on the Internet. Training in the use
of digital communication tools based on different didactic needs received a mediocre response, with 27% answering that the training was very good or fairly good, with a further 68% saying it was very poor or fairly poor. The three aspects which were considered the least emphasized were exercises in the use of ICT for adapted education, where 76% answered it was very poor or fairly poor; the development of competence for ICT-based school/home communication, with 77% of the teachers answering in negative terms; and finally the use of ICT to develop learners’ collaboration skills, where 80% of the teachers found their training to be very poor or fairly poor and only 17% thought it was fairly good or very good (Figure 4).

Discussion
By answering the questionnaire the newly qualified teachers provided information about their experiences with ICT, teaching and learning. We therefore gained some insights into what newly qualified teachers perceive they have derived from their teacher education in terms of the development of their professional digital competences and the use of ICT in teaching. The newly qualified teachers responded to questions concerning various aspects of their teacher education as it pertains to ICT. They were also asked how ICT could contribute to their teaching, whether they wanted or needed to improve their digital competences and, if appropriate, how they believed CPD should be brought about.

Our main finding was that there were positive attitudes towards the use of ICT in teaching among the newly qualified teachers we surveyed in Norway. In addition, almost 80% of the respondents felt that they would like to receive more training in the use of ICT. This may be explained by the generally moderate use of ICT in primary and lower secondary schools, as seen in previous research (Egeberg et al., 2012; Hatlevik, Egeberg, Gudmundsdottir, Loftsgarden, & Loi, 2013). However, when the teachers were asked whether their teacher education had contributed to increased knowledge about the use of ICT in their own teaching, they replied that their teacher education was not particularly good in this respect.

It is interesting to note that the teachers considered themselves to be competent ICT users, even though they were not particularly satisfied with the educational benefit of their own professional training in the teacher education programmes. For example, all the teachers answered that they would be able to create a presentation containing text and images even though the majority of them were not satisfied with their training on the production of multimodal texts provided in their teacher education. The fact that the teachers still responded that they were able to accomplish several tasks using ICT even though they were dissatisfied with the training they had received may indicate that they were able to advance their ICT education outside their teacher training programmes. It is also possible that they possessed a good general digital competence but lacked the professional aspect from their teacher education. One assumption could be that, like their students, newly qualified teachers use ICT for leisure activities but it is not certain that they emphasize the scholastic use of ICT.

It is possible that newly qualified teachers are improving their digital competence through self-study or a trial-and-error approach. In this way, they would be able to acquire the skills they need in accordance with the requirements of the curriculum and
their schools. It is also possible that the requirements imposed by schools on newly qualified teachers are not sufficiently clear regarding the use of ICT in pedagogical practice. Research has shown that student teachers have problems when it comes to identifying and understanding their own digital competence (Engen et al., 2014). Similar results have also been found when assessing learners (Hargittai & Shafer, 2006). It does not appear that teachers experience major problems meeting the demands and expectations of using ICT in the teaching profession despite the lack of priority with respect to ICT experienced in teacher education programmes. The teachers in this study agreed that they were able to meet the expectations of the curriculum and their schools. This may be explained by low demands in the area of ICT integration. Two recent studies showed that Norwegian primary and lower secondary students attend schools that have good access to technology, but the students and teachers reported that more moderate or mediocre levels of technology were used during lessons (European Commission, 2013b; Hatlevik et al., 2013).

**Limitations of the study**

There were several limitations that need to be considered in this study. There were clear limitations regarding the sample size and the number of respondents described in the method section. Our intention was to have a larger sample size of teachers to ensure representative distribution of the population. It was both challenging to identify new teachers through school principals as well as to reach the teachers and convince them to voluntarily answer the questionnaire. Furthermore, those who ultimately participated in the study may well have been teachers who were techno-enthusiasts or those who were generally more interested than most in the better use of ICT in teaching and learning. Additionally, the study was based on self-reported data, which is always a potential source of bias.

**Conclusion**

Based on our findings, we argue that we have a starting point for discussing the extent to which there is a correlation between teacher education programmes, the day-to-day working lives of teachers and the use of ICT in Norwegian schools. This is particularly important as the field of newly qualified teachers and their experiences with ICT use in teacher education programmes has thus far been a rather neglected research area in Norway. We have revealed areas where further research is needed. This particularly applies to our findings related to the positive attitudes towards the use of ICT in teaching and that the teachers considered themselves to be competent ICT users. Still they reported that they were not particularly satisfied with the educational benefit of their teacher education programmes and wanted to receive more training in the use of ICT. Requirements imposed by schools on newly qualified teachers are not sufficiently clear regarding the use of ICT in pedagogical practice. All these aspects need to be explored further.

To conclude, the newly qualified teachers in this study reported a discrepancy between teacher education programmes and their need for CPD for their work. Drawing on these findings, it is clear that pre-service teacher education can be strengthened to support newly qualified teachers in technology-rich classrooms. Further research is needed to identify which aspects pre-service teacher education should focus on and which aspects should be included in teacher education programmes, as well as to ascertain the ongoing
need for professional development and in-service training in the field of ICT in education.

References


Authors’ biographies

Greta Bjork Gudmundsdottir holds a PhD in Comparative and International Education from the University of Oslo, Norway. She has conducted research in several countries in Africa on ICT integration in teacher education and the appearance of the digital divide faced by schoolchildren and teachers in Southern Africa. Gudmundsdottir is particularly interested in marginalized and disadvantaged groups and their access and use of digital technologies. At present she works as a researcher at the Norwegian Centre for ICT in Education in Oslo where she is a part of the cross-disciplinary research team exploring digital competence and digital responsibility by schoolchildren, teachers and student teachers in Norway. Gudmundsdottir is a member of the executive committee of the Nordic Comparative and International Education Society (NOCIES) and is a co-editor of the peer-reviewed Nordic Journal of Digital Literacy.

Ove Edvard Hatlevik is a researcher at the Norwegian Centre for ICT in Education. He completed his PhD from the University of Oslo in 2006 with a dissertation about learning strategies and motivation among airline pilots. His research interests are learning strategies and motivation when students are learning with technology, and how schools develop leadership when implementing ICT. Currently Hatlevik is working on two projects. First, the Monitor project aims to identify the use and experience of ICT among students, teachers and school leaders, as well as their attitudes towards it. Second, the Identify Digital Competence (IDC) project is about how to identify and measure digital competence among students in primary and secondary schools based on the digital competence aims of the Norwegian curriculum. Hatlevik is a co-editor of the Nordic Journal of Digital Literacy.

Geir Ottestad is the head of the kindergarten and teacher education department at the Norwegian Centre for ICT in Education. He holds a Master in Sociology from the University of Oslo, Norway. His research interests are, among others, classroom leadership and large-scale surveys on pedagogical and organizational challenges in developing digital literacy and digitally competent organizations. He was the project manager and co-writer of the 2006 Norwegian part of the “International Association for the Evaluation of Educational Achievement Second Information Technology in Education Study” and is at present the project manager for the International Computer and Information Literacy Study (forthcoming November 2014).

Lene Karin Wiberg holds a Master of Science in Information Technology from Narvik University College, Norway. She has over 10 years’ experience working with education policy in higher education within the Ministry of Education and Research. Wiberg is particularly interested in the way international as well as national policies and curricula influence teacher education institutions, and how policy transforms into everyday practice. At present she works as a senior adviser at the Norwegian Centre for ICT in Education in Oslo where she is a part of the cross-disciplinary team of policy advisers exploring digital competence and digital responsibility by schoolchildren, teachers and student teachers in Norway.