From IT to Tablet: Current Use and Future Needs in Kindergartens

Nina Bølgan

Nina Bølgan
Associate Professor, Oslo and Akershus University College
ninabolgan@getmail.no

English abstract

This article describes chronologically the main lines of the implementation of ICT in kindergartens, and ICT's place in education programmes from the mid-1990s until today. It discusses the lack of interest among public authorities in recognizing the role technology can have in modern early childhood and the necessity of promoting digital literacy in kindergartens and pre-school teacher education.

Keywords: ICT, implementation, digital literacy, early childhood, kindergarten, pre-school teacher education

Introduction

It is a big step from the technology of the late 1980s and today's touch technology. The tablets of today are convenient because they can be turned on and used anywhere and require only a simple plug-in cable to recharge. Several media reports over the past year have shown that tablets are being used in many kindergartens. Today ICT (information and communication technology) includes a wide range of digital equipment. Children are now able to find information while online, through browsing the web or playing games, watching videos, Skyping with relatives; some children as young as kindergarten are even blogging. For children (0–6 years) growing up today, digital media are part of everyday life, and children will use technology as a matter of course. However, there is still work to be done before kindergarten and pre-school teacher training programmes recognize the important role that technology can have in modern early childhood education.

This article describes the main lines of implementation of ICT in kindergartens, and ICT's place in education programmes from the mid-1990s to the present day. It discusses the lack of interest among public authorities in promoting digital literacy in kindergartens and pre-school teacher education. Integration of ICT in both is still in its infancy. There is a need to exchange and debate strategies to make recommendations for educational policy in this area, and to raise educational attainment and embed a culture of lifelong learning. The article examines a debate on ICT and digital literacy in a kindergarten academic setting.

The first tracks 1989–2004

Everyday technology

We have to go back to 1989 to find the first digital tracks used in kindergarten. The booklet *Kvardagsteknoloiog EDB i barnehagen* (Askland, 1989) was written in connection with a pilot scheme about six-year-olds and school commissioned by the two ministries in charge of kindergartens and schools at the time. The intention of the booklet was to support educational work with children aged 4–9 years. It described problem areas and barriers to including technology in kindergartens, as well as issues relating to children's activities with the computer. Only a few kindergartens had a computer at that time and the booklet was probably ahead of its time. There were, however, some projects about the use of computers (Hagerup & Hansen, 1989; Loraas, 1994; Nordisk Ministerråd, 1999; Jessen, 2001).

How to understand children and ICT

In the mid-1990s children with special needs used computers that kindergartens could borrow from the Norwegian Labour and Welfare Administration. The computer was seen as a useful tool for these children, but not appropriate for normal-functioning children; they were not allowed to use it. The activities at the computer were seen as sedentary and passive. This belief is not accurate, but the prevailing discourse was that computers did not belong in kindergartens.

Mediating is an important notion. The actions and competences of early years practitioners are passed on to the children through artefacts and becomes part of social and cultural activities (Vygotsky, 1978). A closer look at how staff interact with children often reveals how they communicate and pass on their understanding of ICT to children. To better understand the slow implementation of ICT, it may be useful to look briefly at how understanding of children also

influenced early years practitioners' view of ICT. Some research projects from this time focused on adults' attitudes and views on ICT in kindergarten (Lundkvist, 2002; Ljung-Djärf, 2004: Siraj-Blatchford & Siraj-Blatchford, 2004).

Opinions are constructed from one's own experiences, and in dialogue and relationships with others. In dialogue, values, culture and relationships are parts of the totality (Dahlberg et al., 2002). If early years practitioners look at children and childhood as pure and vulnerable, and ICT as something children have to be protected from, "new" technology will be a challenge. Children have to be kept away from the unacquainted technology, which is unnatural and a bit dangerous, since the adult may not have control of it herself. If early years practitioners were short of, or lacked digital literacy, they would adopt a protective attitude and restrict the children's use of the computer to playing games (Ljung-Djärf, 2004).

If staff, however, look at children as individuals with thoughts and emotions from which they create meaning, early years practitioners can choose to include digital activities in their teaching practices and make the child the main part in such work. However, training is required to exploit this potential (Ljung-Djärf, 2004; Siraj-Blatchford, & Siraj-Blatchford, 2004).

In the mid-1990s, several discourses probably co-existed side by side. The prevailing discourse in kindergarten influences how early years practitioners expresses and behaves in relations to ICT, and how they exercise their digital practice with children.

Framework plan

Framework Plan of Kindergarten (Barne- og familiedepartementet, 1995) mentioned technology and media, which were moving into the world of children's play. Kindergarten could reflect and create context in children's experiences, and reinforce the technological experiences a child brought from home. It was particularly important to encourage girls to use the computer. Technology was featured in the field of nature, environment and technology. The computer was perceived as a technical tool, which may explain why it has taken time to understand that computers and other digital tools offer many opportunities in an educational setting.

Nordic conferences

The Nordic Council of Ministers held an IT conference in 1998, which brought together participants from pre-school teacher education and kindergartens from the five Nordic countries. The conference represents a turning point in efforts to implement ICT in these two working areas. The conference resulted in drafting the first steps necessary to put ICT in both pre-school teacher education and kindergarten programmes; these steps were then used to begin implementing political and academic support. First, it established a national status report that pointed out the lack of ICT in pre-school teacher education (Nordisk Ministerråd, 1999). Secondly, it applied a request to the Ministry on ICT's place in a new framework plan for pre-school teacher education (Langset, 1998) since the former plan (Lærerutdanningsrådet et al., 1980) was neither designed for that time nor future challenges. ICT had to become a required subject in pre-school teacher education as in teacher education programmes. Thirdly, the first further education in ICT for preschool teachers was planned and later implemented as part of a Nordplus Project (Valvik og Habbestad[1]). And finally, an ICT website was created as a channel for ICT-related news and information.[2]

Local project

During 2000–2001 four kindergartens in Klepp and Karmøy communities completed a local project on "ICT in kindergartens". The purpose was to gain experience in using ICT as a tool for achieving the goals of the Framework Plan concerning learning through play. This was a pioneering work and the project group applied for funds in the Ministry of Children and Family Affairs who was responsible for kindergarten at the time. The Ministry showed no immediate interest, but replied: "Maybe next year. You're too early" (Steingildra, 2000; Pedersen, 2001a).

The European project

"MediaGuide" was an EU-funded project aimed to inspire change in ICT work and guide children to use the computer for creative activities. "MediaGuide" consisted of parallel projects in Denmark, the Netherlands, Spain and Norway during the period of 2001–2002. In Norway, lack of digital equipment made it difficult to try out activities with children as extensively as the project would have liked. Still, the project presented examples of what children could accomplish with technology. The evaluation from the participating countries showed principally the same results: money was needed for digital tools and software, training was necessary, and local interest and support had an impact on what was achieved (Bølgan, 2008b).

KidSmart-programme

Since 2002 IBM's programme "KidSmart Early Learning" has donated computers to kindergartens in Norway. A development project directed at practitioners was attached to the donation during the first year. For many, this project was their first encounter with ICT as an educational theme. The project stimulated adult curiosity, increased motivation and contributed to creative activities with children. Where kindergartens did not participate in training, the computer was mostly used for games, and the children often played games alone (Bølgan, 2004).

International reports supported the notion that training and continuous professional development were necessary for the successful implementation of ICT and to exploit the educational possibilities that new technology represented (Förskolan, 1999; Han, 2003; IBM 2003;Samuelson & Sheridan, 2003; Learning and Teaching Scotland, 2003; Ljung-Djärf, 2004; Siraj-Blatchford & Siraj-Blatchford, 2004; Ministry of Education in New Zealand, 2005).

LærerIKT and kindergarten

In 2004, the Ministry of Children and Family Affairs was sent a request for funding of a further education pilot in ICT for early years practitioners. During 2001–2004, educational materials and networks that operated a web-based further education programme for teachers were developed. This material was considered useful in supplementary training of practitioners in kindergarten programmes.[3] However, the Ministry this time referred to the ongoing revision of the Framework Plan for kindergartens, and declined financial support (Barne- og familiedepartementet, 2004). Thus, the Ministry lost the opportunity to obtain further systematic experience in a context of creativity and learning in order to strengthen children's cultural expression as well as their reading and writing skills. Some examples of such works already existed in the Nordic countries (Borud, 2000; Jessen, 2001; Pedersen, 2001b; Engan & Otnes, 2002; Klerfelt, 2002; Irgens, 2003; Trageton, 2003; Jørgensen et al., 2005).

Summary 1989–2004

Practitioners were making innovative use of new technology, even when resources and funding were limited. Experience indicated that the most successful works were carried out where practitioners had some digital expertise. Kindergartens that succeeded had often some enthusiasts who managed to keep working despite the chaos and hardship. It was difficult to create forums for discussion and professional development when interest in ICT was not rooted in staff. It legitimized practitioners to stay away from ICT. Political signs are important, yet the Ministry of Children and Family Affairs showed neither interest in supporting efforts to gain experience of ICT's potential in kindergarten setting, nor in developing digital literacy among practitioners.

A new Framework Plan for kindergarten content and tasks

In 2004, the Ministry of Children and Family Affairs began efforts to revise the Framework Plan for kindergarten. In this process there were various suggestions for taking a closer look at the impact modern technology may have on kindergartens in the future. One recommendation was to consider the possibilities that technology represented for the kindergarten field (Søbstad at.al, 2004). Additionally, cameras were mentioned as useful and interesting in documentation of children's play and learning (Søbstad et al., 2005). As a topic, ICT is becoming visible to a wider audience in education.

A committee was established to work out a new Framework Plan. The committee knew little of ICT in kindergartens and had a working document prepared. Among other things, the document raised the need for qualification for practitioners, and for discussion of children's play and learning in the light of technological developments and research in the area (Bølgan, 2005a).

In July 2005, the proposal for a new curriculum was delivered to the Ministry of Children and Family Affairs. In a separate chapter, media and ICT were described as important issues and as significant cultural phenomena of modern society. They should, therefore, be seen as natural parts of everyday life in kindergarten. Several examples of how ICT could be included in learning areas were given as well (Moser et al., 2005).

The proposal of the Ministry was circulated for comment in September 2005. Surprisingly enough, neither the technological changes that had occurred nor media and ICT were taken into account (Barne- og familiedepartementet, 2005). Due to a general election, there was a change of government. From 1 January 2006, the Ministry of Education and Research became responsible both for kindergarten and pre-school teacher education.

In the process that led to the establishment of the Framework Plan that applies today, suggestions were made to clarify ICT in the text of the plan. It was referred to the considerable funds that the government had previously spent on ICT in teacher education and schools, but nothing was done in regard to kindergarten and pre-school teacher education. Resources were necessary to develop and implement digital tools in the educational processes in these activities (Bølgan 2006a).

The term "digital tools" was introduced in the *Framework Plan for kindergarten content and tasks* (Kunnskapsdepartementet 2006). The plan called attention to the fact that, "Children should have the opportunity to experience how digital tools can be used for play, communication and the

gathering of information." The wording suggests that kindergartens should take ICT seriously, but does not determine this clearly.

Media in general is mentioned in learning areas as *Local community and society:* "This learning area also covers the importance of the media in the everyday lives of children" and that must "Help to ensure that children have an inquisitive and critical attitude towards what they see in the media." Use of technology is also mentioned in the following learning areas: *nature, environment and technology* and *numbers, spaces and shape*s. The Framework Plan to a certain extent points out that early years practitioners must "build on and develop the children's experiences of technological toys and technology in everyday life" and ensure that children have access to and make use of various types of technology. However, this is rarely mentioned when digital tools in kindergartens are discussed in other contexts.

Additionally, this Framwork Plan appears to be based on the understanding that ICT primarily focuses on the tools, rather than the actions tools can bring. It seems to ignore that ICT can play a potential role in the cognitive, social and emotional development of children. Looking, however, beyond the few sentences about digital tools and technology in the plan, it has proved possible to provide such tools a place and meaning in other contexts, such as education, culture, democracy, documentation, ethics, language, participation and philosophy (Hildén, 2005; Thestrup, 2006; Klerfelt, 2007; Bølgan, 2008a; Moberg & Lindén, 2008; Kalas, 2010).

As support for kindergarten in the efforts to introduce a new Framework Plan, the Ministry had booklets made that took up the theory and principles, and disseminated knowledge and experiences. One was a booklet on *IKT i barnehagen* (Bølgan, 2006b). This seemed to facilitate the creation of new possibilities to develop the educational aspects of ICT. Children bring their digital experiences into the kindergarten, regardless of early years practitioner policies on technology. A booklet on ICT could be seen on as a signal to the kindergarten to take such experiences seriously.

To inform about the plan, disseminate good practice and inspire practitioners, three national conferences were held in 2006 (Djupedal, 2006). "Klikk der!" was a conference on using digital tools in kindergartens. The purpose was to present the experiences, innovative work, strategies and research. The target groups were early years practitioners, teaching staff in pre-school teacher education, research institutions and others that were concerned with ICT in kindergarten. "Klikk der!" is still held annually in different parts of the country and is the only conference that focuses on educational work with ICT in kindergarten.

National strategy for improving staff's competence

A staff's professional and personal competence is an important resource and a prerequisite to ensure that the kindergarten is a good arena for care, play, learning and socializing (St.meld. nr. 41, 2008-2009). Therefore, a national strategy for improving early years practitioners' competence was established. Both the project and preparatory work for the General Plan, had announced needs for initiatives to develop digital literacy (Søbstad et al., 2004; Bølgan, 2005a; Bølgan, 2005b; Moser et al., 2005, Bølgan et al., 2006c).

The introduction of the Framework Plan and the booklet on ICT challenged early years practitioners in several ways. The Framework Plan contains formulations that presuppose practitioners were updated with how ICT can be used in the kindergarten, both for playing and learning. However,

such updating was far from reality. Signals of digital literacy from the Ministry had so far been weak and unclear. To the extent that development of digital literacy took place, it was on the initiative of the prime movers in pre-school teacher education. While the integration of ICT in school was a matter for the community, the integration of ICT in kindergarten and pre-school teacher education was an invisible issue.

However, the national strategy for improving early years practitioners' competence from 2007, does not mention digital literacy (Kunnskapsdepartementet, 2007a). So far, scarcely any supplementary training or further education has been offered on appropriate technology. ICT has, in a way, been a nonexistent topic. There is, unfortunately, a lack of both strategy and money to promote educational use of ICT.

Commissioned by the Ministry, a survey on staff competence was carried out. More than half of respondents mentioned the need for education in ICT (Moser et al., 2006). The national competence strategy would help to support and strengthen the development of local skills in a period of significant change to the kindergarten area (Kunnskapsdepartementet, 2007a). Surprisingly, digital literacy was not mentioned in the strategy plan; however, this lack of discussion was questioned. The answer from the Ministry was that, because digital literacy could be linked to several activities in kindergarten, it was natural that training in the use of digital media would be part of the already established focus areas in competence strategy (Kunnskapsdepartementet, 2007b).

The final report of skills strategy describes ICT as one of several recurring themes (Asplan Viak & Fafo, 2011). This may indicate that ICT is well taken care of. Oslo and Akershus University College has delivered numerous course lectures and conference presentations, and was most frequently used regardless of a municipality's geographical location (Asplan Viak & Fafo, 2008). The courses seem to have acted both as an "ICT-wake-up call" and a boost for ICT. They gave participants a new outlook on what ICT can encompass (Bølgan, 2009c). The courses, however, have often been isolated measures, and rarely part of the already established focus areas. Only exceptionally, did the kindergarten owner have a plan for further investment in digital literacy.

The development of digital literacy appears to be well taken care of, but can easily become an excuse for inaction. It requires resources, clear public signals and time for development. It is not enough to put digital tools into kindergarten and believe that the early years practitioners will handle them insightfully. A new report on training needs in kindergarten, commissioned by the Ministry, shows that nearly half of employees report that they need to improve their digital literacy (Gotvassli et al., 2012).

Competent staff stimulate and engage children to work together and learn in different ways. Perhaps it is necessary to point out that using digital tools does not mean that kindergarten should cease first-hand experiences and traditional activities. Early years practitioners will still organize different and meaningful experiences required by the Framework Plan. This includes the use of various tools, including digital tools. Positive results can be gained when technology reinforces fundamental learning, is associated with experiences in real life and children's active engagement, and when group participation is included. In that way digital tools provide children with opportunities to learn in different ways.

A minimum level of resources is important, too. If a kindergarten only has one computer and access to it is timetabled and controlled, the impact on children's development will be low. However, a

diverse range of tools and software that can be used throughout the day as multi-functional tools and integrated with other activities will have a greater impact on play and learning (IBM, 2003). Then ICT can stimulate creativity, and motivate and encourage children to acquire new skills and knowledge.

An information society for all

Commissioned by the Ministry of Government Administration and Reform, a nationwide survey aimed to increase the knowledge of ICT-resources available, and to describe the ways in which they were used by children and staff was carried out in 2008.

This was part of the Ministry's development of the field of digital competence. The background was the White Paper on *Eit informasjonssamfunn for alle* (Fornyings- og administrasjonsdepartementet, 2006), which briefly described ICT in the kindergarten sector. The survey showed that whatever vision early childhood practitioners had of using digital tools in a kindergarten setting, children only participated in fairly limited activities, such as playing computer games and taking photos. Only occasionally were children allowed to draw and write, or to print their drawings and texts. As many as 85% of respondents reported that they needed to increase their digital literacy (Bølgan, 2009a).

Another survey on the use and attitudes concerning digital tools in kindergarten showed that although there are several digital tools used in kindergarten, they are seldom used creatively and rarely by children (Kvinge et al., 2010)

In the light of these results, it was necessary to explore this theme further and take a closer look at the need of national ICT-strategy in the kindergarten sector and in pre-school teacher education.

White Paper on quality

Educational use of ICT and digital literacy in schools has been widely discussed in many official documents, while the equivalent in kindergarten is rarely mentioned. The White Paper *Kvalitet i barnehagen* (St.meld. nr. 41, 2008-2009) examined the role kindergarten plays in overall learning and social levelling. Specifically, digital literacy should be central to education at all levels. Mastering digital tools is important in modern knowledge society, and the use of digital tools is defined as basic skills in school curricula. In the White Paper, the Ministry regards the use of ICT as a means of high-quality, innovative kindergarten environments. By giving children a minimum knowledge base of digital tools, kindergarten can help counteract the digital divide among children and contribute to social equality.

What the Ministry intends by "a minimum of knowledge" is unclear. This lack of clarity has perhaps resulted from the fact that digital expertise in kindergarten is not mentioned anywhere in later documents. A document on systematic educational services to all pre-school children (NOU 2010:8) could have been a suitable document to account for the ICT and its place in kindergartens. The only thing the committee has proposed in the ICT field is that parents should be able to borrow computer games on children's language. A number of documents have highlighted the need for digital literacy; despite this finding, digital literacy is absent in revised competence plans too (Kunnskapsdepartementet, 2007a; Utdanningsdirektoratet, 2012). If early learner practitioners are not digitally literate and are reluctant to acquaint themselves with the opportunities technology offers, then the digital divide between children, referred to by the Ministry, will not be bridged until

later, if at all. Development of competencies is essential to strengthen kindergarten as an educational institution. However, is this possible without including digital literacy?

ICT in pre-school teacher education

Children's practices involving media and ICT pose new challenges for the digital literacy of the pre-school teacher practitioner. The evaluation of pre-school teacher education in 2001 (Norgesnettrådet, 2002) was a preparatory work to the current curriculum. The evaluation showed that pre-school teacher education was facing challenges, such as the use of traditional teaching methods and course content combined with new areas of knowledge and use of technology, such as ICT and similar initiatives.

According to the current curriculum for pre-school teacher education (Undervisnings- og forskningsdepartementet, 2003) working methods should be designed so that students are using ICT in children's groups and in administration of kindergarten as well. ICT as a tool for organization, communication, play and learning should be part of the university college's local curriculum, not as a separate area, but across subjects and topics covered in the study.

The curriculum gave each university college greater freedom to choose the weighting between subject and organization of education, which has contributed to large variations between them. There is a lack of knowledge and the status in the content and extent of teaching and the use of ICT in pre-school teacher education. It still seems reasonable to assume that there have been major differences in how the students' needs for digital literacy have been met (Sjøhelle, 2008; Taarud, 2009). In 2004, 70% of pre-school teacher education provided ICT training to enable the students to use technology throughout their study (Bølgan, 2005b). Only three colleges offered lectures or seminars in which ICT in kindergarten was discussed or where educational programmes were presented.

A survey of the status of the investment in digital competence in teacher education showed that teaching staff did not have sufficient knowledge of digital practices to meet the educational and professional challenges that digital literacy entails (Hetland & Solum, 2008). There is no reason to believe that the colleges have made it easier for pre-school teaching students to meet and use ICT creatively and critically. Maybe it is a reflection of the lack of interest in and of digital literacy among those who teach students, not to mention an absence of messages from the Ministry of Education and Research. Besides, it can be a challenge to get pre-school teaching students to realize that digital literacy is needed in the future kindergartens to the extent it is offered in seminars and courses. Today, digital literacy should not be something that can be discarded.

During the last 4–5 years several university colleges have offered specialization and further education in ICT, either as pure ICT studies or as part of another study (including Agder, DMMH, Oslo, Sogn og Fjordane, Stavanger, Vestfold, Volda, Tromsø). Many studies have been participant-funded, and are therefore expensive for the students.

In terms of research into the impact of ICT in kindergarten there is still a great deal of research left to be done. A survey of existing empirical studies on the quality and content of kindergarten, showed that research on the use of media and ICT was deficient (Borg et al., 2008). ICT is a relatively new priority area, but a regular part of childhood. Borg et al. found one thesis at Master's degree level (Sinnerud, 2007) and four projects on the subject (Bølgan, 2008a, 2009a; Kvinge et al., 2010;

Knudsen & Ødegaard, 2011). These projects are completed and reports are available from the first three projects. From the last project there will be several articles that deal with issues relating to image pedagogy. There is a need for further research that involves practitioners and will lead to the development of practical solutions and guidelines that will encourage good practice.

The fact that colleges show greater interest in ICT has resulted in books with theoretical arguments and ideas about how the tools can be used in different educational contexts and related to all disciplines in the Framework Plan.(Bølgan, 2008b; Letnes & Jæger, 2008; Moberg & Lindén, 2008; Sjøhelle, 2008; Bølgan, 2009b; Bergersen et al., 2010; Høiland & Winje, 2010; Waterhouse, 2011). The following Master's level theses have been produced (including Hjelle, 2008; Laupsa, 2008; Nilsen, 2008; Hansen, 2009; Gåsland, 2011; Simensen, 2012) and theses on the PhD level are in progress (Jernes[4], Lafton[5] & Letnes[6]). Practitioners have begun writing about their experiences in books (Undheim, 2011) or via websites and blogs.

Assuming that pre-school teacher education will provide a relevant and forward-looking perspective on both the profession and the institution's role as a part of education, we should strive to support students' needs for digital literacy. There are requirements for managers at different levels today to use digital tools in administrative contexts. Also, practitioners have a part to play in ensuring ICT security in society. It is necessary to know about privacy, ethics and rights and obligations when using the Internet (Datatilsynet, 2008; Østrem et al., 2009; NOU 2009:1). It is also an expectation of utilizing digital tools for documentation and communication between home and the kindergarten.

A successful development of the use of ICT in pre-school teacher education depends on educational policy. The government is committed to ensuring that students in higher education are trained in and use of ICT as an integral component of their study and thus they will encounter it in working life and society generally. Digital literacy will be a key part of what is considered a valuable skill-base moving forward (Wilhelmsen et al., 2009); but digital literacy is not clearly mentioned in the national regulations for a new pre-school teacher education beginning in autumn 2013 (Kunnskapsdepartementet, 2012b). The regulations only mention that future pre-school teachers should have broad knowledge of children's emerging digital skills. Based on the regulations and national guidelines (Kunnskapsdepartementet 2012c), each institution shall develop local plans. The national guidelines contain more about digital media and digital literacy than does the current curriculum, but are only indicative for university colleges. It is still up to each college to interpret ICT into their local plans.

National Centre for ICT in education

So far, there has been a lack of governmental strategy and funding to promote expertise in the educational purposes of ICT in kindergarten and pre-school teacher education. It is hoped that this is about to change. The National Centre for ICT in education (IKT-centre) was established in 2010, kindergarten and pre-school teacher education are among the target groups. On the resource pages of the kindergarten project, several projects have already been posted concerning activities that include the use of digital tools in a kindergarten setting.

The centre has completed the first national survey of "Småbarns (0-6-åringer) digitale univers", in which parents were asked about their children's access to and use of ICT and media in their spare time (Guðmundsdóttir & Hardersen, 2012). Although playing is still children's most important leisure activity, the survey shows that five out of the ten children are about three years old or younger

when they first use a computer, and four out of ten children are younger than three years old when using smart phones or tablets. Other studies have also shown that children use digital tools at an early age (Medietilsynet, 2010; Kvinge, et al., 2010; Kotilainen, 2011; Moinian, 2011).

The report shows there are still disparities in children's access to digital tools and that some children do not have access to, or are not allowed to use, digital tools at home. These children will face greater challenges when they meet ICT in school than children who already have digital experience. This emphasizes kindergarten's responsibility to reduce the digital divide between children.

The centre will conduct a survey on digital literacy and use of ICT in kindergarten, and is required to make a plan for skills development within ICT in the kindergarten sector (Kunnskapsdepartementet, 2012a). When the Ministry puts forward a new, comprehensive, skills strategy for all early learner practitioners in 2013, one should expect that digital literacy will be a natural part of the strategy.

Conclusion

Implementation of ICT in kindergarten has been going on for years. Although the needs for digital literacy are well documented, there has been a conspicuous absence of public discussion on opportunities, limitations and measures in the area of ICT. Until now, digital literacy has mainly been initiated by local idealists.

It is time now to include kindergarten and pre-school teacher education in national ICT strategies. It is an unequivocal fact that practitioner training is one of the most important issues to successful implementation of ICT and an instrument in social levelling. It is not the digital tools in themselves that are interesting, but how they can support the child's experience to master, develop and create coherence between kindergarten practices and the technological life children experience at home.

It is essential that training goes beyond helping practitioners to develop their ICT skill, but also focuses on how new technologies affect pedagogical processes. The quality of play and learning supported by ICT can increase only if there is ongoing development of early learner practitioners' skills. Enhancing digital literacy in pre-school teacher education and in kindergarten is absolutely necessary. Although it is not possible to demonstrate unambiguously that we learn more or better using digital tools, it seems that they can have a positive influence and stimulate learning. When adults are engrossed in tablets and apps, it is no wonder that children are as well.

Innovative forms of play and learning are more likely to emerge where digital tools are available where children are present and where they can be used throughout the day as multi-functional tools that are integrated with other activities.

The ICT-centre is intended to help promote the development of digital literacy in kindergarten and pre-school teacher education. This work will hopefully open a long-awaited and broad discussion on a theoretical, academic perspective where different actors can contribute.
Whether it is good or not to explore digital tools in kindergarten as part of early childhood curricula is ultimately dependent on early learning practitioners having sufficient expertise to guide and stimulate curious and interested children.

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1 Ragnhild Valvik, University of Agder; & Helge Habbestad, University of Tromsø.

2 From 2009: http://barnehageblogg.wordpress.com

3 Kari Wigstøl, University of Agder; Margrethe Jernes, Stord/Haugesund University College; & Nina Bølgan, Oslo University College.

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5 Tove Lafton, Oslo and Akershus University College. *Digitale praksiser* http://blogg.hioa.no/digitalepraksiser/

6 Mari Ann Letnes, Queen Maud University College. *Digitale danning i barnehagen* http://mariannletnes.com/