



"... it is a major challenge to guide pupils in a field they believe they master."

– student teachers on dealing with pupils' digital everyday

Carl F. Dons. Associate Professor in pedagogy

Department for Teacher and Interpreter Education
Sør-Trøndelag University College
Email: calle.dons@hist.no

Abstract

The main aim of this article is to answer the following research question: How can we prepare student teachers to deal with pupils who have a wide range of day-to-day experiences of the digital world? This question arises out of the understanding that today's student-teacher training is inadequately equipped to realize the potential for learning found in the way that digital technology is now an integral part of the social and cultural practices of children and young people. Based on theory and practice from research and development activities in primary and lower secondary school, the article points out some perspectives connected to the technology culture of children and young people that may have importance for the professional training of student teachers. The article concludes by summarizing some findings from a research project in general teacher education, where it is argued that student teachers can be qualified to cope with the way children and young people use technology by teaching them to adopt solutions based on personal publishing. In many ways the article deals with classical issues in the education field; how the relations between cognition, learning, technology and fellow-citizenship raise practical issues connected to teaching and learning (Dewey, 1915; 1938; 1958).

Keywords: Digital literacy, pupil's digital everyday, media convergence, multimodality, video games, personal publishing, student teachers, general teacher training

Background

There are many indications that today's student teachers are not sufficiently qualified to deal with the digital challenges in school. Several studies show that students in teacher education do not make much use of digital tools in their studies (Rambøll 2004)¹. Moreover, experiences from such research as the PLUTO project² show that the study processes at the teacher training institutions contribute to reproduction of traditional instruction models, thus lacking work forms dominated by pupil activity and the use of ICT (Hauge, 2003; Ludvigsen and Flo, 2002). This relates to the fact that the development of digital awareness in basic education has not gone as quickly as the intentions embedded in central policy documents would suggest.

A number of studies from basic education in the Nordic countries show that ICT still has not been given a key position in pupil-learning processes in school (Kløvstad and Kristiansen, 2003; Drotner 2003; Sørensen, 2001). On the other hand, a number of studies show that the pupils' use of ICT at home is on the rise, both in scope and complexity (Drotner, 2001; Sørensen, 2001; Hernwall, 2003; Erstad, Kløvstad, Kristiansen and Søby, 2005; SSB, 2005). One important dimension in this complexity is that technology is making inroads into culture and ICT is increasingly converging with many other media. The convergence of audio, film, data and mobile technology is erasing the boundaries between consuming media expressions and producing cultural expressions. This opens new avenues for public participation and culture-producing activities. These new avenues are also closely connected to the application of new forms of knowledge and skills. David Buckingham (2003) uses the construct *media literacy* about such knowledge and skills. He points to the challenges found in developing forms of literacy that make young people active and critical participants in the media culture they are immersed in.

Increasingly closer links between globalization and a number of synchronous and asynchronous communication forms demand new broad communicative competence – *multiliteracy* (Cope & Kalantziz, 2000). A number of studies describe how children and young people include digital technologies in their interplay, developing multimodal expressions and new social practices (Drotner, 2001; Gee, 2005; Kress, 2003; Tapscott, 1999; Lankshear & Knobel, 2006; Livingstone & Bovil, 2001; Steinkuehler 2006). They move among several technologies (mobile telephones, game consoles and internet applications) where areas and ways of use merge and influence each other. This gives new opportunities for communication and places new demands on such classical skills as reading and writing. Active participation in computer games and internet-based arenas such as "My Space", "Facebook" and "YouTube" represents additions to the socialization of children and young people where they participate in a number of collective practices in which personal voices and expressions are combined with problem resolution and knowledge sharing. These collective practices also help us study how children and young people use digital media as part of a techno-cultural education process (Løvlie, 2003). Putting the way in which children and young people use technology into an education perspective means we have to study how information technology can influence the relation between the individual and the culture he or she is part of (Løvlie op. cit.). Bearing such an education perspective in mind, we may also ask whether new conditions are created for legitimizing the role of school in the pupils' education process. In a society where technology increasingly contributes to complexity and information diversity, the role of school as a contributor in a democratic education process is challenged.

Media convergence and multimodality

The democratic education process is, as has been previously mentioned, connected to the fact that children and young people become critical participants in the media culture that shapes them. This shaping process is also connected to the fact that being a fellow citizen means being able to produce utterances on a digital public stage. Media convergence and multimodality are keywords for how the new technological formats may result in greater opportunities for variation in the utterances of children and young people.

Media convergence is roughly about how different media, telecommunications and ICT are woven together. Video, audio, film, data and mobile technology are linked into a plethora of texts and mediation forms. This is seen, for

example, in how the TV medium is permeated by the aesthetics and functionality of the World Wide Web, that response can be given to radio and TV shows via SMS or web-based services, that audio, video and film can be processed and integrated in digital formats, and that computer games can be played with familiar characters from films, TV shows or literature. Computer technology can produce characters and allows the combination and manipulation of text, graphics, audio and video in ways that transcend the boundary of our traditional understanding of writing and reading skills. This enables new text forms and genres which in turn contribute to changing the requirements when it comes to text competence. Some of this text competence is connected to the semiotic ambiguity of the text, or its *multimodality* (Kress 1998; 2003). We are here talking about various text forms that can be combinations of video, audio and writing. A key question is then how to develop pupils' text competence to provide new opportunities for expressing themselves, participating and learning. Children and young people are exercising text production in their spare time, and one way of strengthening their text competence may be to include the day-to-day recreational culture of the young in the school context. David Buckingham maintains that the development of technology has meant that the distance between the culture of school and the recreational culture of the young has increased, and that school therefore must endeavour to build a bridge to span what he has called the *digital gap* (Buckingham, 2006). Much of what we see indicates that school has overlooked the informal forms of learning that pupils practise in their spare time. A case in point is playing computer games, an increasingly popular recreation activity among children and young people, and a field which is now being subject to more and more research (Gee, 2003; 2005; 2005; Stenkuehler, 2006). A vital question for this research is the extent to which computer games may represent such an informal learning arena.

Are Video Games Good for Learning?

This headline is from an article by James Paul Gee in *Digital Competence* magazine (Gee, 2006). He refers in particular to a research field focusing on the hypothesis that playing computer games contributes to learning (Shaffer, Squire, Halverson & Gee, 2005; Gee 2003; 2005). Researchers claim that good computer games use basic principles of learning and therefore may contribute to the development of learning systems for serious use in and outside school. Gee identifies the following connections between learning principles and good computer games:

1. Video games can create an embodied empathy for complex systems
2. They are simulations of embodied experience
3. They involve distributed intelligence via creation of smart tools
4. They create opportunities for cross-functional affiliation
5. They allow meanings to be situated
6. They can be open-ended, allowing for goals that meld the personal and the social.

(Gee, 2006 , p 179).

Needless to say, this does not apply to all forms of computer games and it is important to bear in mind that in the multitude of video games there are a few that are more or less adapted for learning purposes. A common way of dividing these games is to distinguish between problem games and world games. The former are games solving a given problem, while the latter category simulates a wider universe. Both categories are about cooperation, where a participant must perfect specific skills and learn to integrate these skills as a member of a group or team. Each group member must have specialized knowledge – *intensive knowledge* – and general knowledge – *extensive knowledge* – including knowledge about the functions of the other group members. This

requires a high degree of intersubjectivity, or a common understanding of the situation. There is much to suggest that this type of cooperation in commercial computer games (as for example *Word of Warcraft*) has transfer value when it comes to interdisciplinary cooperation in school and working life. An example is the implementation of distributed integrated operations connected to the extraction of oil in the North Sea.³ Computer games may function as tools to construct learning rooms which in turn may provide a plethora of learning experiences. Hence computer games may also mediate discussions, reflections, facts and analyses. Computer games are thus not only interesting because of their content, but just as much for the way they contribute to new discoveries, initiate negotiations, constructions and knowledge journeys (Egenfeldt, 2006, p 201).

However, it is not always the case that potential learning qualities in computer games actually promote learning per se. This depends on how they are used and the extended learning contexts they are part of. And this is where we find the challenge for school; how can school contribute to reinforcing the learning potential in good computer games? We need to ask how we can create extended learning contexts and we need to discover which aspects of the teacher role are most appropriate in this context. This will include the content of learning, work forms and assignment cultures.

... then we would just have carried on playing our own computer games

Andreas Lund maintains that: "the practices we find outside school must find their (critical) resonance inside school" (Lund, 2006, p 275). In a study under the project initiated by the Norwegian Directorate for Education and Training, "Lærende Nettverk 2006-2008"⁴ (Learning Networks 2006-2008), we find one example of this (Dons & Hokstad, 2007). In the county of Sør-Trøndelag this project has attached importance to challenging the pupils to develop multimodal texts. In the 2007 school year a number of multimodal texts have been produced by pupils from Year 1 to Year 10. Thematically, they have a broad range, from recreational tasks such as "My holiday" and digital Christmas cards sent to family and friends, to more academically oriented texts dealing with social studies, mathematics and music. A common feature of these texts is that pupils spend very little time learning the technology itself. They are highly aware of multimodality and it is natural for them to produce texts where they combine monomodal text with video, audio props and music. Work processes are collective, highly cooperative and involve knowledge sharing.

The Apocalypse Dudes

The Apocalypse Dudes is a film made by five boys in Year 10. It has a number of sequences where the main characters (the two dudes) are sitting on a couch watching TV. What they watch on TV ranges from music on MTV to daily news reports.



When they start to work on their film, one of the boys says:

"... we were given a project assignment in music to prepare a presentation combining music and video. We saw that many pupils started making music videos and wanted to do something different. Since we all are into computer games we realized we could do something like that and decided to make a film. We spent two hours at school brainstorming and planning, and then we set up a Local Area Network, and the film was completed in a night."⁵



Each scene in the film is painstakingly produced, and great importance has been attached to the use of music and live footage. Several scenes are put together from animation clips taking elements from computer games. These have then been combined with animation the boys have made and music they have selected. They use this to present a version of a daily news feature from the war in Iraq.



The scene from the war in Iraq is introduced with very dramatic music, and we see soldiers preparing to attack a tank coming their way. Suddenly the setting changes, the music switches to another mood, now sounding happy and fast-paced while the tank is pursuing soldiers in a game of tag. Finally the tank inexplicably explodes. We see that the pupils have used different technologies, including word processing, audio clips, music, pictures, film and four different computer games. We also see that they are able to communicate their message through different semiotic layers.

Combining existing resources into a new product or expression is one of the characteristics of how the internet continues to be adapted for use in new contexts. As a technique this is a type of collage or mashup that is part of Web 2.0. The activity features knowledge sharing (LAN as a work form) and the application of technology must be called quite sophisticated. Equally important as the use of technology is, of course, the way the pupils use such techniques as humour and irony. Here also familiar elements from the media

are combined in fresh ways, whether the genre ideal is music performance on MTV or an updated news presentation on NRK (the Norwegian Broadcasting Corporation) or CNN. The pupils pointed out that their intention in re-contextualizing their media experiences was to produce more than mere entertainment. They also wanted to demonstrate their critical distance to modern media and the presentation of news, and demonstrate that they have *media literacy*. In the words of one of the pupils:

"We primarily wish to entertain by using elements from TV, film and computer games that we like, but we also want to be critical and ironic about the various media, such as film, TV news and computer games."⁶

This film bears all the appearances of being self-made, but also reflects the interaction in a social community, society and culture. The pupils are in dialogue with and the counterparts of the presentation forms that dominate in popular culture. An example of this is that the film was not put on YouTube until their co-pupils had seen and discussed it.

The film offers interesting perspectives on the knowledge and skills that are realized when school's assignment discourse meets the pupils' after-school digital habits. In the words of one of the pupils:

"... if we had not been given such an assignment ... then we would just have carried on playing our own computer games. School gave us a challenge that we rose to because we were able to do what we do after school in new and different ways ..."⁷

This points out the importance of developing assignment cultures that involve the technology children and young persons actually use. The example shows how school can help create and extend the learning context and thus exploit the learning potential found in the pupils' participation in computer games. Furthermore, this example shows that the teacher must be able to interpret, accept and develop the pupils' forms of behaviour and expression - *multiliteracy*. The teacher must also help to increase the pupils' academic development by providing them with established knowledge (literacy in the traditional sense). For this the teacher must have adequate insight into the field to increase the learning dividends of the pupils, regardless of their different literacies.

Through the way the pupils re-contextualize their media experiences we also see a fledgling development of critical distance representing an approach to elements of "classical education" or "literary education" (Liestøl, 2006). The didactic challenges are found in the point of convergence between the pupil's emergent classical education and the teacher as the administrator of classical education ideals.

eLogg

Another example of dealing with the digital day-to-day experiences of pupils is the development and testing of the word processing tool eLogg. This is a virtual learning environment for primary and lower secondary school based on web logs and wikis (Hoem, 2005). The underpinning idea for this word processing tool is the benefits of blogs⁸, highlighting the personal voice, combined with the Wiki idea⁹ that anybody can share and edit texts. The core function of eLogg is a blog-like learning environment that connects participants via the texts they produce. Activities are connected to a specially designed website with pupil texts in focus. Each participant can see the texts of the others and also see what they do with them. In the project "Dramaturgi i distribuert læring" (Dramaturgy in distributed learning) (Hoem, 2005) e-Logg

has been tested at all levels in primary and lower secondary school. In 2005, a total of 250 pupils participated in this pilot testing, and project findings showed that the pupils demonstrated greater text competence. Many of the pupils who participated wrote hypertexts collectively and multimodally.

In the spring of 2006 the use of eLogg was studied among pupils in Year 5 at a school in Oslo and another school in Bergen. Four classes at these two schools joined a common learning arena. The pupils demonstrated multimodal playfulness and inventiveness in this arena. The door into the pupils' texts was a framework story prepared by the teacher, a multimodal text with a number of pointers to texts written by the pupils. Østerud et al. (2006) summarize it as follows:

"By taking the initiative to create a common hypertext within the framework of eLogg the teacher invites the pupils to join a writing process where the pupils' own entries help make the community's richly branching texts meaningful, informative and appellative to the other members. Jointly they build a hypertext where the division of roles and responsibility is initiated by the teacher's framework story which then functions as scaffolding for the pupils' short factual texts. The fact that readers can navigate between the nodes means that they create their own reading progress. The pupils recognize this freedom from their digital recreational culture such as games and chatting." (Østerud et al. 2006, p 220).

Experiences from the project "Dramaturgy in distributed learning" showed that the open form of the eLogg more easily invited "collective and process-oriented activities such as writing a log, writing together, discussions and chatting." (Schwebs, 2006). The pupils' active exploitation of the visual and semiotic resources found in the graphic interface of the eLogg demonstrates that they have substantial multimodal competence (Østerud et al. 2006). By referring to themselves, and in part to their surroundings, the pupils also use eLogg to stage themselves in the world. In this project it appears that success was obtained in uniting informal non-institutional learning with school's formalized learning environment by lowering the threshold to recreational texts. A decisive factor for releasing pupil writing is also, in this connection, the manner in which the teacher facilitates the assignments. It also appears that the pupils' eLogg activities developed good social interaction patterns precisely because they were writing for an audience, for each other and not merely handing in assignments using a traditional Learning Management System (LMS) (Schwebs, 2006).

Digital day-to-day experiences and general teacher training

Above I have pointed out how the digital day-to-day experiences of pupils in primary and lower secondary school may serve as the point of departure for learning in school. The question is whether we have a similar point of departure when it comes to learning for student teachers. What challenges does teacher training face when it comes to promoting learning in contexts dominated by media convergence and multimodality? For teacher training students, we are talking about a type of dual qualification, as the students must apply new technologies in their own studies process while also being able to use technology to support the learning of their pupils.

In time, recruitment to teacher training will increasingly come to consist of "digitally native" students (Prensky 2001). These are students who have as many technological experiences from their normal lives as today's pupils in primary and lower secondary school. The issue then is how these students

should strengthen their qualifications for their professions as teachers. Do these students have the same need to stage themselves in the world (Goffmann, 1959) as pupils in primary and lower secondary school? Do they also have the need to participate in interaction patterns where they are writing for an audience, for each other? There is much evidence that suggests that we need to train teachers who are comfortable with activity structures with individual and collective orientation and which also play out in different contexts (Lund, 2006, p 286). A consequence of this is that teacher training must prepare students to a greater extent to participate in a digitalized public sphere. This means that the student teacher must present impressions, play roles and appear as a "teacher to be", which also means to join "performances" on different "stages" (Goffmann 1959.). One possible path might be to challenge students to present themselves through personal websites, allowing the creation of new stages for student self-presentation on the way to a teacher role.

Having a personal website means writing for oneself while also publishing in public. Because the owner of a website has access to elements of the user interface that are closed off to others, this is a type of publication that lends itself to mediating a role in relation to others (Hoem, 2004). Rasmussen (2003) maintains that personal websites may appear as a medium from the individual to society, comparing it with the bourgeois saloon Habermas describes in "Strukturwandel der Öffentlichkeit". Personal websites are thus a way to practise identity, a practice occurring in a public space. Challenging students to present themselves with their *work identity* (Beck, 1992; Giddens, 1996) in such a public space is also an important aspect of qualifying the student teachers for their profession. Terje Rasmussen (2003) describes self-presentation on the web as a new type of resource used for presentation and *impression management* (Goffmann, 1959) of a person's public image:

Websites are a way of writing, a way of conquering a field with texts about oneself, but more importantly, produced by oneself, published by oneself." (Rasmussen, 2003, p 1).

In self-presentation on the web one can select and consider the techniques and the style with which one wishes to appear – without disruptions. Being an asynchronous medium there is more time for back-stage (Goffmann, 1959) preparations, allowing self-criticism before facing one's audience. This means that a person stages him- or herself through what is published, but we must also consider that this occurs in interaction with a collective (Hoem, 2004).

On track of the teacher role

In the spring of 2005¹⁰, I explained in a case study connected to a pilot test of digital examination folders in pedagogy (they were formed as websites) how student teachers can develop new opportunities for knowledge and self-presentation through personal publication on the web (Dons, 2008). The point of departure for this study was to challenge the students to present their academic work from their studies, reflect upon their own study process and give grounds for their selection of works. Such a dossier was also intended to allow a comprehensive assessment of processes and final products (Dysthe, 2003). Another point was that the students were to be given the opportunity to express themselves through multimodal texts. The students had produced a rich selection of digital texts in varying genres and formats they had produced in the course of their two first years of studying.

Called "On track of the teacher role!" the students were to present their "track" (personal and academic) that led them on their way to the teacher role, with emphasis on academic reflection. The examination dossier was to be designed

along the lines of a website with requirements for hypertext and multimedia presentations.

As a minimum, the website would need an entrance text ("meta text") describing the student's "track" on the way to the teacher role and a rationale for the selection. Moreover, it would need to include an academic article based on issues connected to the theme of the teacher role. It would also have pointers to examples and reflections showing the student's development relating to didactic processes, internet-based communication and digital competence. The students started the work process early in the second year of studies and worked on their dossier throughout the period they had access to it. Work seminars were also conducted where the students shared knowledge connected to design and content. The work was characterized by the exchange of experience and knowledge sharing, particularly during the final phase before handing in their work where the students intensified their activities through work seminars they initiated.

Method

The intention of tracking the academic reflections of the students on a website required a methodological approach that enabled them to have an explosive design. The method chosen was therefore qualitative, and the study may best be described as a case study. A case study is exploration of a bound system through in-depth data collection comprising several sources (Creswell, 1998). The informants, 50 students, left tracks through digital presentations as websites and as contributions to two different LMSs¹¹. The core material was, however, the 50 examination dossiers. All this material was studied using document analysis before a selection was made of a sample of eight students. Criteria for this selection included variation in relation to gender, quality of content (grade) design and hyperstructure. The folders from these students were then subjected to a more thorough analysis. The eight students were then interviewed one year after they had submitted their examination dossier. Each interview lasted around 45 minutes, and a high level of openness was sought so we could capture the students' personal reflections. Postmodern critiques of interviews (Scheurich, 1997) suggest that the interview situation often is controlled by the researcher's theory paradigm and previous understanding, and that there is thus a need for new ideas about interviews that expand the "knowledge universe" and open for varied types of interaction. Bearing this in mind, the interview was arranged so that the student sat facing a screen studying his/her own personal website while the interviewer was seated by his/her side. The point of departure for the interview was thus that the student contributed reflections while looking at his/her website. The interviews were stored in mp3 format and later transcribed to provide a better basis for analysis (Kvale, 1997; Thagaard, 1998).

Findings

Analysis of the students' websites showed that they put their own stamp on the presentations. This applies to the choice of how to make statements and content. There is extensive variation when it comes to the use of illustrations, pictures, film, choice of colours, fonts and animations, and in the interviews the students underline how the freedom to choose graphic designs and publication styles is very important for the self-presentation or staging. In the words of one of the informants: "... the fact that I am pleased with my digital development is reflected in this website, which offers both an aesthetically pleasing design and user friendliness." There is, moreover, a trend that the students take their inspiration from website genres that are more closely connected to popular culture, such as web newspapers. The internet-based presentations thus appeared very much as personal creations, but also reflect

interaction with social communities, society and culture. They are in dialogue with and a counterpart to the presentation forms that prevail in popular culture. It is also clear that the informants have felt the challenges as something personal, and they make it clear that presenting themselves as professionals to other people than just their teachers is a special situation. In the words of one of the students during an interview:

.... it was very good to be challenged in this way. It wasn't pedagogy as reeling off the curriculum but rather pedagogy as when you're a teacher. You were forced to think more deeply... a way to improve what you've done before. Working on my website I found out how to make a better impression not only on my education teachers. The website allowed me to make a statement as to who I am and what I stand for as a teacher – like in selling yourself... (Dons, 2008, p 87)

The students put much work into both presenting themselves through the choice of multimodal utterances and in the selection of content. Much of the work done backstage has also been dominated by knowledge sharing. One of the students says the following in the examination folder:

... we have helped each other with fancy tricks and better design, we have resolved technological problems and so on. Thus we have applied Lev Vygotsky's socio-cultural learning theories in practice. We have acquired new knowledge in interaction with others. We have been "supporting scaffolding", helping each other in the "proximal zone of development." (Dons, 2008, p 87)

Through the work on their own websites the students have been challenged to reflect upon the opportunities this type of technology has in relation to the learning of pupils in primary and lower secondary school. This is what one of the students said during an interview:

It's important to be able to design websites so that I'm able to help my pupils make their own websites where they can put their own work and reflect on it, just like I have done on my website. This enables the pupil to place him- or herself in a better light, and, for example, allows recreational activities to liven up the schoolwork (Dons, 2008, p 88)

Through their reflections the students show insight into much of what characterizes the technological day-to-day life of pupils outside school. They also think of the educational challenges these experiences bring. In the words of one of the students in an interview:

... the pupils are happy to work with a computer, but they are not quite able to use the computer in their learning activities. It's difficult for them to find good sites for their subject on the internet, and they are not good at formulating what they actually find. Therefore the teacher's selection of what they should learn and source materials are at least as important as before, but it's really a major challenge to guide pupils in a field they believe they master ... the teacher needs to know about computers ... know what the pupils are talking about ... including what goes on outside school ... must know about computer games and be able to assess what might be suitable in school. (Dons, 2008, p 89)

The way our informants have presented themselves through personal publication shows that they have what we might call media literacy, i.e. they appear with clear work identities and demonstrate exuberant use of

multimodality and hyperstructure. There is much to suggest that they have conquered a new stage for academic self-presentation, a stage also used to reflect upon the digital day-to-day life of pupils in primary and lower secondary school.

Conclusion

In this article I have drawn attention to the fact that there is a need for institutional learning in the digital day-to-day experiences of children and young people. Using examples from primary and lower secondary school I have shown how school has changed its assignment culture, and graphic interfaces may promote learning through re-contextualizing the digital day-to-day experiences children and young people have. These experiences are highly characterized by media convergence and multimodality. I have also shown how collective and process activities such as writing logs, writing together, discussions and web chatting can help pupils learn. Moreover, I have argued that the technological experiences from outside school that children and young people have should be placed in a techno-cultural education perspective (Løvlie, 2003), and that this concerns active participation in the media culture children are immersed in. Using a techno-cultural education perspective I have pointed out the importance of challenging student teachers to participate professionally in digitalized public spaces. Based on Goffman's (1959) construct of self-presentation and Rasmussen's (2003) description of personal publication on the web as a new type of resource for presentation and impression management, I have attempted to show how student teachers present themselves in a digital public space. I have also pointed out that through publication on the web student teachers are both in dialogue with and a counterpart of presentation forms that characterize popular culture. The students thus participate in some of the same arenas as pupils in primary and lower secondary school and they use their own experiences as the point of departure for reflection upon the technological day-to-day culture of their pupils. Presenting oneself front stage demands comprehensive work backstage. Because the web is an asynchronous medium there is more time for backstage preparation. It is, however, vital to facilitate such activities which should also include experience exchange and knowledge sharing. Based on the ability of computers to present multimodal texts (Kress, 2003), I have also shown how student teachers' digital competence is connected to awareness of the use of multimodal texts in their own academic presentations on the web and in reflections connected to the learning of pupils in primary and lower secondary school. I have also drawn attention to the fact that digital competence as a meta perspective on technology and learning is closely connected to having control of the interfaces used for presentations. It also appears that the experiences made by student teachers when it comes to personal publication generate reflections relating to technology and learning for pupils in primary and lower secondary school. When working on the encounter with digitally native pupils and students it is important to use solutions based on personal publication because the basis for this is the personal activities of those who learn as producers of content and knowledge, which is a requirement for all learning.

References

- Beck, U (1992). *Risk Society. Towards a New Modernity*. London: Sage
- Buckingham, D (2003). *Media education. Literacy, learning and contemporary culture*. Cambridge: Polity Press.
- Buckingham, D. (2006). Defining digital literacy. What young people need to know about digital media. In *Digital Kompetanse*, vol. 1, no. 4: 263–276.

- Cope, B. and Kalantzis, M. (2000). Introduction. Multiliteracies: the beginnings of an era. In: Cope, Bill and Kalantzis, Mary (eds.) (2000). *Multiliteracies. Literacy, Learning and the Design of Social Futures*. London and New York: Routledge
- Creswell, J.W. (1998). *Qualitative inquiry and research design. Choosing among five traditions*. Thousand Oaks. CA: Sage.
- Dewey, J. (1915). *The school and society*. Chicago: University of Chicago Press
- Dewey, J. (1938). *Experience and education*. New York: Collier Books
- Dewey, J. (1958). *Art as experience*. New York: Capricorn Books
- Dons, C. F. (2008). På sporet av lærerstudenters digitale kompetanse. In Guldal, T. Et. al. (2008). *FoU i praksis 2008. Rapport fra en konferanse om praksisrettet Fou i lærerutdanning*. Trondheim. Tapir akademisk forlag
- Dons, C. F. (2006). Digital kompetanse som Literacy? Refleksjoner over ungdomsskolelevers multimodale tekster. In *Digital kompetanse* Vol. 1, no. 1: 58-73
- Dons, C. F. & Hokstad, L. M (2007). Digital literacy – Towards a re-description of literacy for digital learning environment. Proceedings *Interactive Computer Aided Learning – ICL2007*. Villach, Austria
- Dons, C. F. and Skjærvold, S. O. (2004). Fleksibel IKT støtta praksis ved HiST. In *FoU i praksis*, Trondheim: konferanserapport HiST
- Dons, C. F. and Skjærvold, S. O. (2005). IKT og praksisfellesskap i allmennlærerutdanning. In *FoU I praksis*, konferanserapport NTNU
- Drotner, K. (2001). *Medier for fremtiden: barn, unge og det nye medielandskap*. Copenhagen: Høst & Søn.
- Egenfeldt-Nielsen, S. (2006). Overview of research on the educational use of video games. In *Digital kompetanse*, Vol. 1, no. 3: 184-213
- Gee, J. P. (2003). *What Video Games Have to Teach Us About Learning and Teaching*. New York: Palgrave MacMillan
- Gee, J. P. (2005). *Why video games are good for your soul: Pleasure and learning*. Melbourne: Common Ground
- Gee, J. P. (2006). Are Video Games Good for Learning? In *Digital kompetanse*, Vol. 1, no. 3: 172-183
- Dysthe, O.(2003). *Digitale mapper i lærerutdanninga*. Oslo: Abstract forlag.
- Erstad, O., Kløvstad, V., Kristiansen, T., Sjøby, M. (2005): *ITU Monitor 2005. På vei mot digital kompetanse i grunnopplæringen*. Oslo: Universitetsforlaget
- Giddens, A. (1994). *Modernitetens konvergenser*. Copenhagen: Hans Reitzel
- Giddens, A. (1996). *Modernitet og selvidentitet: selvet og samfunnet under senmodernitet*. Copenhagen: Hans Reitzels Forlag
- Giddens, A. (1999). *Den tredje vei. Fornyelsen av sosialdemokratiet*. Oslo: Pax forlag
- Giddens, A. (1991/1996). *Modernitet og selvidentitet. Selvet og samfunnet under senmoderniteten*. Copenhagen: Hans Reitzels Forlag.
- Goffmann, E. (1959). *Presentation of Self in Everyday Life*. NY: Doubleday Anchor. Norwegian translation: *Vårt rollespill til daglig. En studie i hverdagslivets dramatik*. Oslo. 1992. Pax forlag.
- Hauge, T. E. (2003). *Praktisk pedagogisk utdanning i digitale læringsomgivelser. Sluttrapport fra PLUTO prosjektet 2000-2003*. Pp. 1-33: ITU

- Hoem, J. (2004). Personlig publisering og mediekompetanse. Downloaded 8 June 2006 from http://infodesign.no/artikler/Personlig_publisering_og_mediekompetanseITU_04.pdf
- Hoem, J. (2005). Digitale læringsomgivelsers kommunikasjonsmønstre. Downloaded 8 June 2006 from http://infodesign.no/artikler/LMS_vs_PP_v10.pdf
- Hernwall, P (2003). *barn@com – att väkta upp i det nya mediasamhället*. HLS Förlag. Stockholm
- ITU (Forsknings og kompetansenettverket for IT i Utdanning) (2005). *Digital skole hver dag – en helhetlig vurdering av digital kompetanse i grunnopplæringen*. Oslo: ITU
- Kløvstad, V. and Kristiansen, T. (2003). *ITU monitor 2003*. Oslo: Universitetsforlaget
- Kress, G. (1998). "Visual and verbal modes of representation in electronically mediated communication: the potentials of new forms of text." In I. Snyder (ed.). *Page to Screen. Taking Literacy into the Electronic Era*. London & New York: Routledge.
- Kress, G. (2003). *Literacy in the new media age*. London: Routledge.
- Kvale, S. (1997). *Det kvalitative forskningsintervju*. Oslo: Ad Notam Gyldendal AS.
- Lankshear, C. and Bigum, C. (1999) Literacies and new technologies in school settings, *Pedagogy, Culture and Society* (formerly Curriculum studies), 7(3): 241-61
- Liestøl, G. (2006). Sammensatte tekster – sammensatte kompetanse. In *Digital kompetanse*, Vol. 1, no. 4: 277-305
- Livingstone, Sonia and Bovil, Moira (2001). *Children and their Changing Media Environment. A European Comparative Study*. London: Lawrence Erlbaum Associates.
- Lund, A. (2006). WIKI i klasserommet: Individuelle og kollektive praksiser. In *Digital kompetanse*, Vol. 1, no. 4: 58-73
- Ludvigsen, S. and Flo, C. (2002). Innovasjon i lærerutdanningen. Hvordan skapes endring. Pp. 83-104 in *Et utdanningssystem i endring. IKT og læring*, edited by S. Ludvigsen and T. H. Løkensgaard Hoel. Oslo: Gyldendal Akademisk.
- Løvlie, L. (2003). "Teknokulturell danning". In Slagstad, R., Korsgaard, O. & Løvlie, L. (eds.) *Dannelsens forvandlinger*, Oslo: Pax forlag
- NOV (2005). *Utredning om digital tilstand i høyere utdanning*.
- Qvortrup, L.(2004). *Det vidende samfund. Mysterier om viden, læring og dannelse*. Copenhagen: Forlaget Unge pedagoger.
- Rasmussen, T. (2003). Masken foran masken. E. Goffmann og personlig fremstilling på web. Downloaded 14 May 2007 from <http://www.media.uio.no/personer/terjer/Goffman.pdf>
- Schaffer, D. W., Halverson, R., & Gee, J. P. (2005). Video games and the future of Learning. Downloaded 4. Mars 2008 from http://coweb.wcer.wisc.edu/cv/papers/videogamesfuturelearning_pdk_2005.pdf
- Scheurich, J. J (1997). *Research Method in the Postmodern*. London: The Falmer Press
- Schwebs, T. (2006). Elevtekster i digitale læringsomgivelser. In *Digital kompetanse*, Vol. 1, no. 1: 25-43
- Statistisk sentralbyrå (SSB) (2005). *Norsk mediebarometer 2004*.

- Steinkuehler, C. A. (2006). "They Game (Culture) Studies Now?" In *Gamers and Culture*, Vol 1 Nr 1 Januar 2006, Sage Publications.
- Sørensen, B. H. (2001). *Multimedididaktikk og læring – Børn og unges multimedieproduksjon*. Copenhagen: Gads forlag
- Thagaard, T. (1998). *Systematikk og innlevelse, en innføring i kvalitativ metode*. Bergen: Fagbokforlaget
- Tapscott, D. (1998). *Growing Up digital. The Rise of the Net Generation*. New York et al.: McGraw-Hill.
- Tyner, K. (1998). *Literacy in a Digital world. Teaching and Learning in the Age of Information*. Mahwah, N.J.: Lawrence Erlbaum, Inc.
- Vygotsky, L. S. (1978). *Mind in society. The development of a higher psychological process*. Cambridge, Mass.: Harvard University Press.
- Wertsch, J. V. (1991). *Voices of the Mind: A sociocultural approach to mediated action*. Cambridge, MA: Harvard University Press.
- Østerud, S.; Schwebs, T.; Nielsen, L.M.; Sandvik, M. (2006). eLogg – et læringsmiljø for sammensatte tekst. *Digital kompetanse*, Vol. 1, no. 3: 214-226. Oslo. Universitetsforlaget.

¹ Rambøl Management: Evaluation of ICT Efforts in Teacher Education. Final report June 2004.

² PLUTO (Programme for Teacher-education Technology and Restructuring) – the Ministry of Education and Research's cutting edge drive to innovatively restructure teacher education 2000-2004, led by ITU (the National Competence Network for IT in Education).

³ On 15 November 2007 Vidar Hepsø, chief researcher and project manager at StatoilHydro's R&D unit, presented his paper "Power to the edge. Empowerment in the Kristin Asset." to employees at Sør-Trøndelag University College. Here he suggested that young engineers are better equipped to deal with integrated operations due to their digital recreational experiences. Such duties are based on interaction and common understanding between different actors. If such operations are to function, common perceptions of the goals and the conditions are required as well as a high level of available information in the form of real-time data. Integrated operations also require trust, regardless geographical proximity, which appeared more natural to the younger engineers.

⁴ The Learning Networks project is part of "Program for digital kompetanse 2004-2008" (Programme for Digital Competence 2004-2008) and aims to increase learning dividends through the use of ICT. In Sør-Trøndelag county the project is led by Carl F. Dons and Svein-Otto Skjærvold, Sør-Trøndelag University College, Department for Teacher and Interpreter Education. See: <http://lulne.hist.no/>

⁵ Interview at Hommelvik lower secondary school, 15 February 2007. All transcriptions from interviews are originally in the local dialect.

⁶ See footnote 5

⁷ See footnote 5

⁸ A blog is a frequently updated website consisting of short items arranged chronologically. They are open for comments and often have pointers to other websites.

⁹ A wiki is a web-based collection of texts produced by several authors, as, for example, the internet encyclopaedia Wikipedia.

¹⁰ The project "*Fleksibel IKT støtta praksis*" (Flexible ICT-supported practice) (Dons & Skjærvold, 2004; 2005) aimed to study how to exploit ICT as a catalyst for learning processes that placed the reflections of students on their practice in focus. The project comprised students admitted to the study at HiST "*Allmennlærerutdanning med vekt på realfag*" (General teacher training with emphasis on natural science), autumn 2003.

¹¹ *MV forum and It's learning*.