Multicultural pupils and digital technology  
– reflections on the implementation of ICT in multiethnic schools

Abstract
Reflecting on the notion of multiculturalism, the author discusses the recent evaluation of the Norwegian school development project *ICT in multicultural schools. Oslo inner east (IKT i flerkulturelle skoler. Oslo indre øst)* before subjecting the notion of digital competence to scrutiny. It is in this light the author argues for a wider understanding of the conditions under which the learning subject acquires knowledge, an understanding that takes account of the ability of modern technology to extend the competences of the pupil.

**Keywords**
multiculturalism • 4th cultural competence • digital competence

Introduction
Between 2001 and 2004, three Oslo schools took part in an extensive ICT-related project aimed at encouraging ICT use among the large non-Norwegian ethnic school population. It had become clear from our qualitative and quantitative studies (see Hernwall og Vestby, 2005) that the notion of the multicultural, by referring simply to ethnicity, was too narrow. Using examples to illustrate how this broader conceptualisation manifests itself in practice, the article reflects over factors affecting the degree to which learning subjects seize opportunities inherent in an ICT-rich environment. The notion of multiculturalism is therefore used as a sensitizing concept (Sjoberg and Nett, 1968) in the first part of this article, focusing on the conditions of the multicultural pupil. But also as a way to understand the change in the schooling environment; i.e. how the school has become a multicultural arena. Subsequently, in the second part, I argue that we need to review our understanding of the learning subject, moving beyond his/her basic physical presence to a place where conditions of learning and
advances in technology go hand in hand. We need not only to reconsider what to teach,
but also to re-conceptualise the learner.

The three cultural competences – reading, writing and arithmetic – are now joined by a
fourth. Whether this fourth competence counts as a cultural competence, and a necessary
competence at that, is hotly debated. Proponents tend to forefront the dramatic implica-
tions for trade and industry, economy and communications (Castells, 1996, Prop. 1999/
developments in the digital information and communications technology sector (ICT).

In the second media age (Poster, 1995), informational society (Castells, 1996) is by and
large based on digital technology. This is not to say that society is more technical today
than before. It’s enough to think of developments like the plough or the church tower
clock, both of which had an enormous impact on everyday life. But what is unique about
information and communication technology is the pace of growth and social penetration.
Its ability to change is amazing, with new innovations and applications affecting all (or
most) areas of life, society, economy, and so on. The French cyber-philosopher Pierre Lévy
(1997) describes the networks, like the Internet, as a hypercortex, a pattern based on the
ability of the technologies to “promote the construction of intelligent communities in
which our social and cognitive potential can be mutually developed and enhanced” (ibid.,
p. 9–10). Being part of this hypercortex, active users create a collective intelligence, “a form
of universally distributed intelligence, constantly enhanced, coordinated in real time, and
resulting in the effective mobilization of skills” (ibid., p. 13). It is a perception of intelli-
gence that, generally speaking, accords with socio-cultural theory (c.f. Säljö, 2002). Fol-
lowing Lévy, intelligence can be understood as the sharing of ubiquitous experiences and
knowledges enabled by an increasingly ubiquitous technology. In a sense, this is what the
school development project ICT in multicultural schools. Oslo inner east (IKT i flerkulturelle
skoler. Oslo indre øst) (Hernwall og Vestby, 2005) is all about: how best to take advantage of
the affordances of the digital technology for the benefit of pupils whose cultural and lin-
guistic backgrounds, often lead to marginalization at school and/or in society at large.

A Norwegian school development project

The main object of reflection in this article is the three-year school development project
conducted in Oslo, Norway, 2001–04, called ICT in multicultural schools. Oslo inner east
(IKT i flerkulturelle skoler. Oslo indre øst). The project had a threefold mandate:
• Address problems related to pupils’ unequal living conditions.
• Explore the possibilities afforded by ICT in ethnically and linguistically diverse schools
whose.
• Explore ICT as a means of creating flexible and new learning arenas for pupils and
teachers.
These, to a large extent political visions, were then interpreted by the three schools involved in the project, and adjusted to their particular circumstances. The three schools are all situated within a limited geographical area in central Oslo, with a large immigrant population. One is a primary school (pupils aged 6–13), one is lower secondary (13–16), and the last is an upper secondary school (16–19). In the school with the youngest students, from grade one to grade seven, the language spoken at home by more than 90 per cent of the students is other than Norwegian. At the two other schools, the number is significantly lower: around 50 per cent in lower secondary, and around 15 per cent at the upper secondary school.

The three year project focused on development in three areas: basic ICT skills (i.e. installing, using and supporting the technology as such); pedagogical ICT skills (i.e. having confidence in the choice of teaching methods); and innovative ICT skills (i.e. how to use ICT in mastering learning processes, requirements, etc.). A more comprehensive description of the project, together with findings of the evaluation, can be found in the final report (Hernwall og Vestby, 2005). Concentrating on the notion of the multicultural school, this article presents empirical findings that challenge the generally accepted definition of the multicultural as a simple question of ethnicity.

Some notes on method
This article draws on our experiences from the evaluation of the project. The entire process was closely monitored by Guri Mette Vestby at the Norwegian Institute for Urban and Regional Research (NIBR), Oslo university, and myself. We started out by formulating our evaluation questions, based on perceptions of the project’s goals of the schools themselves and the “owners” of the project (i.e. the Norwegian Ministry of Education and Research, and the Norwegian Network for IT-research and competence in education [ITU]). In this formative evaluation, we ended up with the following questions.

• What opportunities for learning and knowledge development are given in a learning environment with high access to different kinds of ICTs?
• What is the relationship between new forms of working and learning, and the development of new roles and practices by pupils at a ICT-based school?
• What sort of communicative opportunities does the form of ICT used give rise to, and how do they affect the learning process and collaboration?
• How do the schools go about developing competence, and what is the impact of their chosen strategy on ICT-based school development?

We adopted a combined qualitative and quantitative approach. Three electronic surveys were used to collect the quantitative data. They were completed by the teachers at the three schools and pupils at the lower as well as the upper secondary school. Quantitative
data were collected at three different points in time: the start of the project; mid-project; and the end of the three-year period. The qualitative data were collected by way of interviews, conversations and on-site observation. The qualitative aspect of the study can be described as a combination of ethnographic and phenomenological approaches. We visited each school on average twice every year, each time with a special focus or interest. We had also selected particular classes at each school which we followed over the three years. The study produced eight working papers, each revolving around a particular issue. Thus, we had both a large amount of quantitative data, giving us an overall picture, and qualitative data to guide our interpretation of actions taken and progress at these schools. Both kinds of empirical data are used to inform this article. (See Hernwall og Vestby, 2005.)

The Multicultural School

As the ambitions of the school development project show, the project centred on pupils from non-Norwegian/Scandinavian cultural backgrounds. In all of the three schools involved, there was an early recognition of the need to develop reading and writing skills, i.e., the first and second cultural competences (the third being arithmetic). This made it necessary to reflect over factors promoting/frustrating the acquisition of competences and knowledges by pupils as well as staff.

One initiative that attracted wider attention was the starting of a publishing company at the primary school. The ambition here was to offer the pupils an opportunity to speak about their own experiences in their native language. With a large majority of the pupils being ethnically non-Norwegian, their experiences naturally varied. But in school, they meet the traditional spelling-book that focuses on the national cultural heritage (i.e. Ole goes skiing in the blueberry wood), which tend to distance them from the project of learning to read and write, rather than the opposite. Therefore, it is most plausible to say that the initiative to establish the publishing company was contingent on the fact that it is a multi-ethnical school with mostly varied reading and writing skills not to mention different languages and alphabets. The students' heterogeneous background is perhaps the most obvious aspect of the school as a multicultural arena. So, with this introductory example, let us consider ways of conceptualising the multicultural school.

Student and teacher competence

One indication of these schools' cultural diversity is reflected in how pupils and teachers/adults use ICT, and how they rate their computer literacy across a range of applications. That computer literacy is generational is by no means unique to these three schools – it is a society-wide phenomenon (cf. Hernwall, 2003). In our case we see it in the tendency of
teachers/adults to use ICT for administration purposes, while the young enjoy exploiting the gaming and entertainment potentials.

Table 1. Self-assessed computer literacy. Based on Hernwall, 2004. The table contains more information in its original version.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Pupils</th>
<th>Teachers</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Games on the Internet</td>
<td>81.8</td>
<td>29.2</td>
<td>52.6</td>
</tr>
<tr>
<td>Downloading music</td>
<td>80.6</td>
<td>34.4</td>
<td>46.2</td>
</tr>
<tr>
<td>SMS</td>
<td>84.7</td>
<td>41.6</td>
<td>43.1</td>
</tr>
<tr>
<td>Chatting on the Internet</td>
<td>71.3</td>
<td>31.5</td>
<td>39.8</td>
</tr>
<tr>
<td>Games on CD-rom</td>
<td>71.5</td>
<td>34.8</td>
<td>36.7</td>
</tr>
<tr>
<td>Taking part in online disc. groups</td>
<td>60.3</td>
<td>33.7</td>
<td>26.6</td>
</tr>
<tr>
<td>Mathematics / counting</td>
<td>50.1</td>
<td>24.4</td>
<td>25.7</td>
</tr>
<tr>
<td>Making homepages</td>
<td>44.7</td>
<td>21.3</td>
<td>23.4</td>
</tr>
<tr>
<td>Print outs</td>
<td>71.4</td>
<td>48.3</td>
<td>23.1</td>
</tr>
<tr>
<td>Graphics</td>
<td>69.5</td>
<td>50.0</td>
<td>19.5</td>
</tr>
<tr>
<td>Making databases</td>
<td>31.9</td>
<td>12.5</td>
<td>19.4</td>
</tr>
<tr>
<td>Surfing the Internet – entertainment</td>
<td>90.5</td>
<td>72.5</td>
<td>18.0</td>
</tr>
<tr>
<td>Presentations</td>
<td>66.2</td>
<td>62.2</td>
<td>4.0</td>
</tr>
<tr>
<td>Connecting to printer</td>
<td>75.7</td>
<td>78.9</td>
<td>–3.2</td>
</tr>
<tr>
<td>Search for subject info. on the Internet</td>
<td>92.4</td>
<td>95.6</td>
<td>–3.2</td>
</tr>
<tr>
<td>Sending group-mail</td>
<td>64.6</td>
<td>71.4</td>
<td>–6.8</td>
</tr>
<tr>
<td>Sending/receiving e-mail</td>
<td>89.6</td>
<td>96.7</td>
<td>–7.1</td>
</tr>
<tr>
<td>Sending/receiving e-mail w. attachm.</td>
<td>84.5</td>
<td>94.5</td>
<td>–10.0</td>
</tr>
<tr>
<td>Writing</td>
<td>87.2</td>
<td>97.8</td>
<td>–10.6</td>
</tr>
<tr>
<td>Educational programs</td>
<td>48.8</td>
<td>60.2</td>
<td>–11.4</td>
</tr>
<tr>
<td>Checking info on the LMS</td>
<td>76.2</td>
<td>95.5</td>
<td>–19.3</td>
</tr>
<tr>
<td>Communicating by way of LMS</td>
<td>49.9</td>
<td>79.3</td>
<td>–29.4</td>
</tr>
<tr>
<td>Publ. info on the LMS</td>
<td>53.4</td>
<td>85.7</td>
<td>–32.3</td>
</tr>
</tbody>
</table>

(LMS = Learning Management System)

As seen from this table, 13–18-year-olds are more likely to see computer skills in terms of playing games on the Internet, downloading music, SMS, and chatting. Teachers, on the
other hand, are more likely to express competence in the use of LMS (Learning Management System, in this case the application ClassFronter); undeniably an administrative tool, and highly appreciated by most of the teachers. These quantitative results allow two observations to be made. The first is that the differences remain stable throughout the three-year period. The second is that pupils are consistently more likely than teachers to report high computer literacy levels within their respective fields of competence. Further, the students tend to report higher computer literacy confidence than their teachers.

Given this disparity in ICT ability, we need to ask how it affects pupils’ learning environment and what teachers are able to teach them. It is, in other words, a question of equality or democracy.

To be an “updated” pupil

To the pupils, there exists no distinct boundary between school and leisure. They download music to their mp3 players while preparing a PowerPoint presentation; they listen to music, check incoming SMSs on their mobile phones (of course, in mute mode), or the in-box on their hotmail account. They spice up their presentation with images from their usb memory stick, and so on. It is reasonable to say that pupils pursue leisure activities at school. As we all know, the leisure preferences of children and adolescents differ from those of adults; they prefer different activities and make other demands on their free time than adults. Mead (1970) wrote about culture and commitment, how children and adolescents in the late twentieth century have experiences and knowledges that grown-ups are lacking. Of course, this was merely the beginning of sweeping cultural changes in western culture. Mead therefore considered the young to be more (to use a contemporary term) “updated”. The fact that young are big media consumers, and are media savvy, make them more or less digitally competent. Obviously, there are great differences in what youngsters understand, master, and know. Generational differences in digital literacy is one further dimension of the multicultural school: pupils are digitally “updated”, the school isn’t. (Obviously, we are not talking about the hardware here: the point of argument is the use, the know-how.) It appears then that the ways in which ICT is used can be both interesting and joyful – as is often the case in these schools – but it is a use that seldom is part of the pedagogical practice. Or, to put it in other (and perhaps more drastic) words, rather than the school prescribing how ICT is used, in most cases the pupils follow their own devices. It is a learning environment where one key element in the learning process is a tool with no clear or obvious pedagogical merits or past practice to guide present use (cf. Papert, 1996, Healy, 1998).

The use of presentations, typically PowerPoint presentations, increased markedly during the life of the project, possibly because it is not related to a specific subject. Also, it is a presentation technique that encourages, to put it academically, a wider understanding
of the notion of “text”, more so than traditional written linear typographical text. Alternatively, PowerPoint presentations give pupils greater freedom to choose modes of expression they most likely are familiar with from their leisure time: images, sound, moving pictures, etc. These presentations are multimedial in a way that the written text or report can never be. They afford the linguistically challenged pupils not just an opportunity to express themselves, but to do so in a pleasing way. Teachers described many instances of underachievers, shy, or insecure pupils creating original and inventive presentations. Obviously, using PowerPoint to make a presentation (or a document written with a text application) doesn’t always guarantee a professional result. But it is a means of multimedial expression that most of the students are familiar with. At the same time, however, the school remains largely text based (most of the information sources are either textual, or oral, as illustrated by Säljö, 2002). The everyday life of the pupils is multimedial, fragmented, and associative. Observers suggest a variety of names to describe the phenomenon: Poster (1995) calls it the second media age, Qvortrup the hypercomplex society (1999), Castells informational society (1996), and Baudrillard simulacra (1983). There are other terms picked up from the digital era. What they all mean is this: a large portion of the knowledges the pupils master and the experiences they make (and are part of) in their everyday life outside school, comes from mass media such as television and the Internet. And this is equally true of both the private and of the public space.

What about school?

Obviously, introducing ICT in a multicultural school is not merely a question of handling the complexity of multiethnicty. It comes with new kinds of “cultural” challenges. It is a technology that on the one hand is an artefact familiar to both students and teachers (or at least something about which they have an opinion), but which on the other has no obvious or unique pedagogical merits or uses (or rather they need to be formulated). That is, it is a technology that is constantly changing and developing, where educational trends or benefits of yesterday already are more or less forgotten. Also, the uses to which it can be put are more or less unlimited, which means that there is no “prescribed” way of using the computer. Seen from this perspective, I think it is reasonable to pose at least two important questions. What should pupils learn at school? Who should have responsibility for their learning? The first refers to the fact that many teachers lack the competence to assess or even support pupils’ use ICT. The second highlights ICT’s blurring of what counts as school and leisure. Let’s start with the former question.

One of the findings of the ICT in multicultural schools project is that most pupils benefit from working with presentation tools like PowerPoint. The reason is multifold. For adolescents who only recently have arrived in the country, and therefore have not had the time to learn the majority language, it offers a less linguistically challenging means of self-
expression in a “multi-textual” form they are familiar with from contemporary media such as television and the Internet. To underachieving or bored pupils, having an opportunity to enter deeply into a subject of their own liking is a further incentive. And, of course, just getting an opportunity to feel proud of producing something which others can take part in – and at the same time looks appealing – is appreciated by most pupils. But, and here’s the dilemma, when they are to be assessed, and especially so in the case of national assessments, they can’t use the tools they have mastered, but are left to their own devices to present and give account of what they know. After having mastered new tools and techniques for both learning and presentation, in the end, they’re not allowed to use them.

The other question raised above refers to the unclear boundaries between school and leisure time. Papert (1980, 1993), along with many others, had a vision at one point of making school more appealing by importing artefacts and experiences from the pupils’ free time. He came later to consider it an implausible proposition (Papert, 1996), arguing that school is way too slow to change, and that the teachers are reluctant to change. Be that as it may (though I think the opposite critique is equally valid, that the technology in many instances isn’t ready for the school), the above illustrates that change is going on in the contemporary school. While the reasons for this change are multifaceted and very complex, let us reflect further over the idea about the merging of school and leisure. From a child/pupil perspective, and given the pace of life of most children and adolescents today, it must seem a doubtful idea at best. The so-called flexible working life we are expected to lead and master, is not just stressful. As studies show (Hanson, 2004), this flexibility harms social life and personal well-being. A corresponding trend is already evident among the young, as more and more of their personal (and private) time is booked with any number of activities. With online computers, LMS and flexible scheduling in schools, the picture becomes even more problematic. Schools are no longer the most obvious place for learning. This leads to the question of who is responsible for students’ learning, and, I think, to a need to reconsider the roles of school/teachers, parents/home, and, of course, the pupils.

The learning subject

One of the great challenges facing pedagogical studies (and the social sciences more generally) and pedagogical practice (in the broad sense) is in developing an understanding of the conditions of socialisation and knowledge development of young people in what is rapidly becoming a cyber society. This is a cyber society where the development of (digital) technology increasingly affects people’s behaviour and capacity to make sense of things. Access or non-access and use or non-use of different forms of ICT present new kinds of challenges to young people trying to appropriate a life world of their own. In
another project, we showed the heterogeneity of uses of the technology in this process (Hernwall et al. 2005). This, of course, makes it necessary to reflect upon what kind of competences, and what kind of knowledges are needed. In a discussion about the fourth cultural competence, Koskinen writes: “The question is if the old encyclopaedic ideal on knowledge, at least in part, has to be abandoned; especially as up-to-date fact can be found quickly on the net. What becomes more and more important are the skills. The skill to find the knowledges one needs” (2000, p. 51, my translation). Noting a distinction between deep and surface learning, Koskinen echoes Marton et al. (1977) in his characterisation of the competence needed. “Understanding and realization”, he writes, “are fundamentally different from mechanical learning. The latter is subjected to the sharp tooth of active forgetting, the former, in a completely different way, becomes permanent” (Koskinen, 2000, p. 51). His description of the fourth cultural competence, compares by and large with how Erstad (2005) characterizes the important contemporary competences, which, in sum, are intertwined with a social and cultural practice of how to use, and make use of, the digital technology (p. 133). The cultural competence, or the digital competence as Erstad among others terms it, has its background in the concepts of media and computer literacy. Attaining this competence means having knowledge and skills, strategies and routines which are context dependent, that make the subject capable of handling large complexities (p. 123). A competence obviously needed in the “multicultural” school described above.

If we are to realize the full importance of this digital competence, it needs to be accompanied by a critical discussion of what it means to be human and the basic conditions under which learning and development take place, about the role of digital technology in contemporary society, and its bearing on learning and development. Following, among others, Haraway (1997), with access to ICT, the condition of the human being (as a biological being) has increasingly become intertwined with the affordances of the technology existing and/or used. Or, to put it another way, the understanding of media as extensions of human consciousness as expressed by McLuhan (1964) meets the critique of Haraway (1997), that human beings can transgress the limits of the body as well as the culture, under the condition that she appropriates the technology as well as a technical, or digital, competence. This meeting of humanity and technology is given a constructivist interpretation by Clark (2003), where the condition of the human is a question of appropriating the technology, rather than being something biologically innate.

In this reading, digital competence is crucially a question of how the cognitive human being can master, in the most beneficial way, the technology and its affordances in accordance with the personal aims and needs. By doing so, it might be possible for the learning and developing subject to appropriate the everyday, by way of using the technology. Undeniably, this might sound like a technicalization of what is human, or dehumanization. But it is nothing but an updated understanding of the human being: Writing skills already
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externalize knowledge and the memory of the subject. This is an externalization that has become more diversified with the computer, the Internet, word-applications and all its functions, usb-memory and so on. So, at the same time as we have all the more tools to extend and increase our capabilities, there are new – and probably, at least to a certain degree, more complex – demands on the human being. Therefore, the learning subject is not to be found solely in the biological being. In order to learn, in order to gain digital competence, the subject has to master contemporary technologies. If the learning subject uses the technology, masters the technology, experiences the technology, then she is also dependent on the technology. Consequently, with current digital technologies, we can no longer see humanity and technology as separate entities. What we must do, is to think in terms of how best to make use of the affordances of technology. Or, to put it in another way, the learning subject is the student + the technology, as a unit. Not separate entities. If we regard the schooling environment in this way, the conditions of the learning subject will most likely take on a different denomination than is presently the case.

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