Talking about ICT in the classroom

- Gender differences in language when using technology

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According to the Swedish curriculum, equality in the classroom has to be practised at all levels of the educational system. What equal learning conditions mean can of course be interpreted in different ways. Giving all pupils the same instructions can be one way of seeing it, giving more help to those who do not understand as quickly another. My interpretation of the Swedish curriculum is that teaching should be differentiated so that all pupils can more easily reach a certain level of competence.

An overriding aim in all my research has therefore been to find out how all pupils can attract attention and be met at an appropriate level of knowledge by the teacher. This is related to Vygotsky's theory of the zone of proximal development (ZPD), in which he says that a teacher has to find out the level of the pupil's knowledge and understanding in a certain area. Building on this is the most successful way for a pupil to develop her or his knowledge further (Vygotsky, 1999). Research that studies pupils' different ways of experiencing phenomena, can be a very good help for teachers to understand pupils' different understandings. This kind of research was developed within a phenomenographic framework in the 70s (Marton, Dahlgren, Svensson, & Säljö, 1977), and even if my research cannot be considered as phenomenographic, it has been inspired by the ideas advocated in this research paradigm.

For this reason, my research has not specifically focused on gender issues, but on drawing attention to marginalized groups, which are sometimes hidden behind the high percentage figures of dominating groups. A teacher has to be able to teach everybody, and because of this there has to be a variation in teaching, so that the needs of less visible groups or individuals can also be met. Large surveys where it is possible to see what is the most common behaviour or opinion are very interesting and also very important, but they have to be supplemented with studies with other foci to broaden the picture.

Sometimes in my research I have found gender differences, which can lead to inequality in education, because the common view is that one of those aspects can be seen as the desirable norm which everybody should achieve. I have chosen to present two issues on gender and ICT from my own research, and discuss them briefly from an educational perspective. My aim is not to give any answers, but to contribute to a discussion about gender, ICT and education.

Technological language and critical thinking

For a long time it was common knowledge that boys were interested in technology, and girls in how to use it. Several researchers confirmed this, which is affirmed in Pedersen's (1998) research review. Eventually the picture broadened, and the earlier 'truth' about gender differences in computer interest had to be questioned (Nissen, 1996).

From data collected for my doctoral thesis, an ethnographic study on 30 Swedish fourth-graders' Internet-seeking (Enochsson, 2001, 2005a), it could be seen that boys and girls had similar interest in the Internet technology in practice, but the boys talked about their knowledge to a greater extent than the girls did. The boys described computers and the Internet in more advanced terms than the girls did. Where the boys used words like 'cables' and 'servers', the girls spoke of 'cords' and ' a central somewhere'. In a later study a girl even used the word 'string'. The girls also invented words like 'dabs' and 'plops', Even the boys who had not reflected a lot on the Internet system used more technological concepts than the girls. However, nothing in my observations could be interpreted as showing that boys were better at using the computers or solving computer-related problems. The difference was only verbal.

A clear example of this from this class is that two girls and two boys described themselves as the person in their families who solved technological problems in connection with computer use. The girls did not show this at school, and no one seemed to have noticed it. Everybody knew about the two boys' computer competence and the boys made no secret of it. The two boys were used by the teacher as resources in school work, which enabled them to develop their competence even further. The girls in the class in general did not use the computers at school as much as the boys did, but the questions about time spent in front of the computer showed no gender differences. Instead of using the computers at school, the girls used the family computers to a greater extent.

When the pupils were in the sixth grade, I had analyzed all the data, and went back to the class to get their view of my analysis. This was part of the validation process and I wanted to know if they could recognize themselves in the picture I had painted. When discussing this issue, they all confirmed that this was the way it usually was. They told me, without me saying anything, that it was more important for boys to show their knowledge, especially in an area like technology. This is also in line with sociological research, which claims that boys' cultures often include hierarchical systems where it is important to show your knowledge to a greater extent than in girls' cultures (e.g. Thorne, 1993).

In addition to a different vocabulary and an eagerness to communicate their skills when talking about technology, the boys and girls talked differently about evaluation of sources on the Internet. This was a problem when analyzing data in the study. To start with, the theories were stage theories of critical thinking (e.g. Perry Jr, 1970). After the first analysis it seemed like the boys had a far more developed way of reflecting on the Internet's reliability than the girls. This was not in line with either my or the teacher's impression. In that phase I started to look for other theories to broaden my view and found Clinchy's (1990, 1996). She points to women's *different voice* (an expression borrowed from Gilligan, 1995) regarding critical thinking, which she prefers calling knowing/knowledge. According to Clinchy, Perry Jr

describes a type of knowing that is mostly represented among males. Clinchy calls this *separate knowing* because it manifests itself in distancing oneself from and questioning other people's perspectives, and it focuses on differences. Perry Jr was criticized because of only asking men in his study. Clinchy did similar studies with women and found a different way of expressing critical thinking, which was more common among females. She calls this *connected knowing*, which instead focuses on similarities. A person dominated by connected knowing tries in the first place to understand the other person's perspective. It is important to develop both separate and connected knowing, according to Clinchy.

When both separate and connected knowing were regarded in my analysis, the result was quite different. The girls in general were then considered as having a more developed discussion on evaluation of sources on the Internet than after the first analysis.

There are two things worth reflecting on. First, with my first theories on critical thinking I could not see the girls' view on evaluation of sources. Second, this was complicated by the girls' lack of technological language. When discussing these matters with teachers afterwards, I found that many teachers are in the same situation as I was – unaware of the fact that there are different ways of experiencing and expressing critical thinking, and also unaware of the importance of having a technological language (the latter also noticed by Colnerud, 1999). This means not only that we cannot see or hear all pupils, but also that we do not have good enough tools for helping pupils to develop critical thinking in relation to the Internet.

What Colnerud (1999) saw among teachers and what I saw among girls helping each other at the computer, was that their only possibility to help was pointing at the screen or simply taking over the mouse. According to Vygotsky (1986), this is a less effective way of developing knowledge, since language helps to develop thoughts and thereby learning.

There were some contradictory results in one of my follow-up studies concerning differences between girls and boys. No differences between boys and girls were noticed among 6-8-year-old pupils, and in a study among ninth-graders it was not possible to see that the boys belonged to a typical boys' culture. The adolescent boys admitted gladly that they did not know anything about the technology behind (Enochsson, 2007b). However, there may be an easy explanation for this result. The class was part of an arts programme, and the pupils were all musicians. The boys were in minority and were not only part of a regular Swedish boys' culture, but also of an aesthetic culture, in this case dominated by girls. This could have given them scope for expressing other attitudes than general boys' attitudes. Since this research was conducted five years later, there is also a possible explanation that technology at this time was no longer specifically a male sphere, and that it was therefore no longer important to express their knowledge in the same way. However, this has not been seen to the same extent in other classes yet.

Write or talk?

It is documented that boys talk more than girls in classrooms and public arenas (Öhrn, 2002). The result described above is only one example of this. It is also documented that groups who find it difficult to make their voices heard have used the Internet to develop their

communication skills (Dahan & Sheffer, 2001; Hall, 2000; Leonardi, 2000; Tapscott, 1997). We also know that girls write more than boys online (e.g. Enochsson, 2007c; Lenhart, Madden, Rankin Macgill, & Smith, 2007), and in the light of the research on marginalized groups mentioned above, it can be easy to draw the conclusion that girls choose an arena where they can express themselves more freely than in the classroom, for example. Another example that supports this conclusion follows here.

In some of my later studies I have used the online media for interviewing. From the start this was a choice of convenience; I was not able to carry out all the interviews in a school class before the pupils finished compulsory school, and I asked the remaining informants if they could consider being interviewed in another setting than school. The options given were in a neutral place like the town library, in their homes or by using MSN Messenger, which I knew most of them were familiar with. Most of them chose MSN Messenger, and it seemed to me that the answers given were as good as in face-to-face interviews. I continued to have synchronous online interviews as an option in my studies, and in the latest study it was possible to interview the same respondents in both interview modes.

Conducting synchronous online interviews when interviewing children and teenagers about their online activities seemed to be a perfect option, since young people who are active online are usually familiar with this kind of communication. There are a lot of advantages, but it can also be seen that the prerequisites for "the new millennium learners" look very different depending on their environment (Dunkels & Enochsson, 2007). For this reason I compared my own face-to-face (f2f) interviews with the synchronous online ditto regarding difference in the amount of words and in the flow of the dialogue between the two media and between some other variables, among them boys and girls (Enochsson, 2007a). All the online interviews were conducted by using the instant messaging (IM) applications MSN Messenger and Yahoo Messenger and are therefore referred to as IM interviews.

The analyses were made from transcripts of 25 f2f interviews and 23 IM interviews carried out in three different studies concerning information seeking and social communities. The interviewees were between 10 and 16 years old and all three studies were initiated at schools. Some IM interviews were also carried out at school. Among those who could choose between interview modes, the boys seemed to prefer f2f interviews and the girls IM interviews. In interviews where there was no option, there were more girls among the drop-outs in f2f interviews, and for IM interviews the drop-outs were mostly boys, even if the numbers are small.

There was a difference in how many words the interviewees used in different media. Overall, the answers were twice as long in f2f interviews (Table 1). This was not unexpected, since, especially among younger pupils, it takes longer to write than to speak. It was among the youngest ones that the difference was the greatest. The difference was less among everyday users; they spoke a bit less. This is an interesting issue to follow up: Are people who are shy, for example, more interested in IM, or are frequent IM-users less skilful in face-to-face meetings because of less practice, or is this just a coincidence?

In f2f interviews the boys had the longest answers, with an average of 19.1 words per answer. The average for the girls was 12.7. In the IM interviews the girls wrote the longest answers, with an average of 10.3 words per answer. The average of words per answer for the boys was 5.3 (Table 1). It could be seen that the differences between different media increased with age. The older girls in the material express more online and the older boys talk more

Table 1

	girls	boys	total
f2f	12.7	19.1	16.0
IM	10.3	5.3	8.3
total	11.4	13.5	12.4

Average number of words per answer for the genders and different media.

There was also a difference depending on the type of question. When asked for facts like practical use of the computer and what to do in specific situations, there was no difference. Examples of questions in this genre could be: "If you have an assignment to do at school where you have to write about an author's life, how would you describe what you do?" The difference between genders was in open-ended questions where the interviewees were given scope to express themselves more freely. Examples of this could be when there were follow-up questions to questions about internet-seeking behaviour. Since most of them searched for information about their interests, they sometimes had to explain how certain forums or data-bases worked. The boys talked more when answering those questions and the girls wrote more.

The interview studies were not specifically about learning, but the questions mainly concerned school activities. Several children said that it can be easier to *write* than to *speak* about more delicate matters, and some said they were shy. In an earlier study on online communities (2005b), the informants said that the Internet is a place where everybody can find his or her space independent of their status in the classroom. A girl who had been quite anonymous in the classroom changed her status among her classmates in a positive way after showing herself in an online community.

If girls in general prefer written media, is there a reason for using IM tools at school? Writing offline has always been a part of schoolwork. Why is there a need for another option? When comparing different modes, it has been shown that speech and IM are closer both in mean length of contribution and in vocabulary richness compared to traditional letters or even e-mails (Hård af Segerstad, 2002). On the one hand, giving more room for IM at school can be a way of making it easier for girls in general, or just shy pupils, to express themselves more freely, which is part of the Swedish curriculum (Skolverket, 2006) – and also of the *Convention on the Rights of the Child* (United Nations, 1990), which claims that every child has the right to use any media to express themselves. Using pod-casting can on the other hand make it easier for boys, who are known to have more difficulty in writing and reading (Skolverket, 2003). Of course all pupils should be trained in all kinds of modes, since general differences do not mean that all individuals in a group have the same preferences or skills.

Classroom activities

How can the knowledge described above be used in the classroom? Even though it is classroom studies that are referred to, different ways of teaching have not been compared or even studied. One thing that is clear is that children's culture outside the classroom is brought into the classroom – in different ways. The general boys' and girls' cultures affect how they approach classroom activities, but also a youth culture.

Problems with young people's cultures are not only a matter of technology. In Sweden there are two recent dissertations pointing to problems in teaching and learning Swedish (Fast, 2007; Olin-Scheller, 2007). Both authors saw the problems that arose when the teacher could not connect to the pupils' experiences from popular culture. A gap occurred between the teachers and the pupils – a gap which widened as time went by. The result was that the pupils did not really understand what the teacher wanted to teach.

Research literature points to a digital divide. This can be global or social (e.g. Norris, 2001; van Dijk, 2005). Sjöberg (2002) raises the issue that access to computers and the Internet must also be regarded from a cultural and psychological perspective. Boys and girls, as well as other groups in a society, can, as described above, have different cultures, which lead to another kind of digital divide. Being a girl in a western society might not, for example, include showing technological competence. Being a boy might not include liking to express oneself in writing.

Is it possible to balance this in the classroom? According to the Swedish curriculum, teachers are obliged to neutralize inequalities of any kind. To be able to do this it is necessary to know what the different ways of experiencing and learning are. As shown above, it is also important to have knowledge about the culture or cultures in relation to computers. In-depth research in combination with large-scale surveys can provide us with this.

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