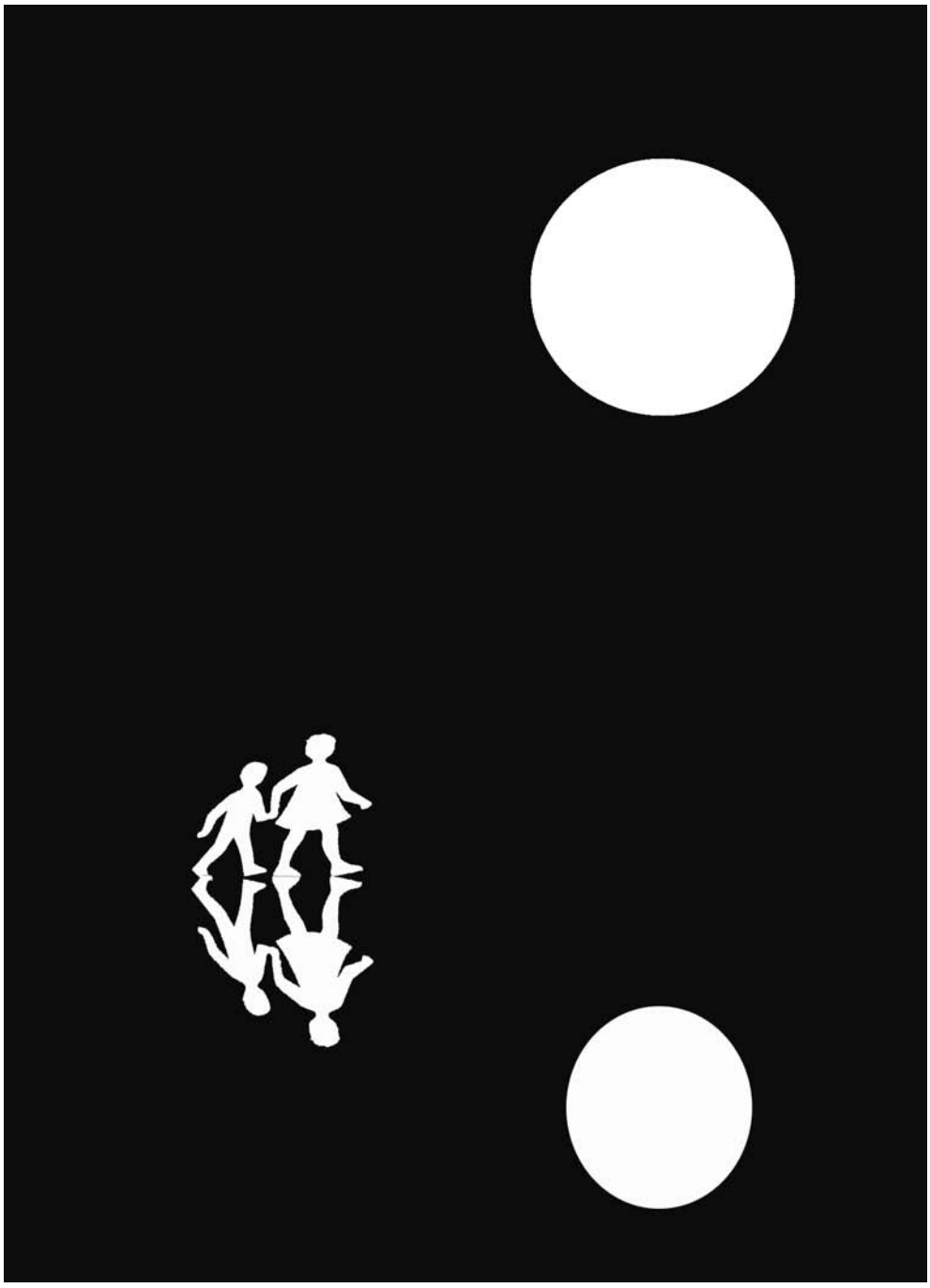
Tidskrift

för lärarutbildning och forskning

Journal of Research in Teacher Education

nr 1 2006

Tema: värdegrund



The Digital Native as a Student

Implications for Teacher Education

Elza Dunkels

Who's gonna pay attention
to your dreams?
Who's gonna plug their ears
when you scream?
The Cars: Drive, 1983

Abstract

This article points out some features of contemporary learning models, claiming that computers and the Internet have changed the conditions of learning and communicating for young citizens – the digital natives. Firstly, it draws attention to the fact that the Internet with its hypertext seems to promote *natural learning*. Secondly, it describes a tremendous amount of *informal learning* – learning that takes place outside the educational system – which computers and the Internet seem to encourage. It acknowledges the growth of *collective learning* – learning that is collaborative and draws on other people's work, constantly adding to our collection of knowledge. The article also calls attention to the *surfacing* of human behaviour that the Internet seems to promote, making it possible to act against negative behaviour such as bullying. Finally, it portrays the *openness* that makes users of net communities exhibit sides of their personalities that traditionally have been hidden from strangers.

In respect of changes in society and the speed of technological changes it is vital that we find a way of listening to young people's views of knowledge and learning. The article concludes that we should discuss how we may integrate contemporary learning models in our educational systems, learn from what takes place anyway and exploit it.

Tidskrift för lärarutbildning och forskning, nr 1 2006 s 43–56 Umeå: Fakultetsnämnden för lärarutbildning. Printed in Sweden

Introduction

My contribution to the study *Questions Pertaining to Fundamental Values in the New Teacher Training Program*[1] will be to write a doctoral thesis about young people's net cultures. The thesis is due 2007, and in this article I use some of the information gathered to portray my part of the project. The ambition is to present some thoughts about the implications that young people's net cultures might have on education. This article however does not claim to envisage the future, only to sketch some learning models used by young people today, leaving any predictions to the reader.

The thesis will be based on a qualitative interview study with over 100 children in grade 6, around 12 years old, spread all over Sweden. The interviews were conducted over the Internet (Dunkels, 2005a), using a chat tool designed for the study. The questions raised in the study were

- What do children find threatening on the Internet?
- How do children cope with these threats?
- How have they developed these counter strategies?

A side effect from conducting the interviews is that I constantly get approached by young people who want to talk to someone about the Internet. When they hear that I am interested in the subject they contact me, to tell stories or ask questions. Some of them are children I have interviewed, some are private contacts, friends of my children and children of my friends. Others contact me over the Internet after reading about my research.

This article is not a direct result of the interview study. When interviewing and analysing my data, I often came across interesting ways of thinking. An example was the 12-year old who answered my question about bullying on the internet with something like

> *Well, you know, it doesn't hurt as much on the internet – physically.*

Until that point I had only read about bullying on the internet as being more abusive than in real life, since it follows you into your home (Cf. Olin, 2003). My finding did not contradict other people's findings; it was just another way of looking at the phenomenon. This is an example of data that was of no immediate use to me, so it resulted in a note to look into this interesting area some time later. These notes

grew in number and when I was asked to give a lecture about the digital native as a student[2], this gave me the opportunity to systematically categorize some ideas that have come up during the interviews and the countless informal conversations with voluntary informants.

Theoretical Background

My discipline is pedagogical work. As a research subject it is fairly new in Sweden, established in 2000. The idea behind this new subject is to support research useful for pedagogical practice. For the first time in Sweden a teacher education certificate can be the foundation for doctoral studies. My teacher education is in mathematics and social science. As a mathematics teacher I am interested in what happens when learning is obscured by fear or perhaps lack of self-confidence. Mathematics and computers are perfect arenas for studying this mechanism, with invisible walls dividing those who have cracked the code and those who have not. As a teacher I have a constructionist view of learning, which is an optimistic view on young people's learning; in the presence of tools and good environment, learning will take place. I regard learning as a natural process and school as a construction with the aim to streamline society's educational task.

Situated learning as formulated by Lave and Wenger (1991, p. 29) seems to describe contemporary learning models very well. They claim that

> *...learners inevitably participate in communities of practitioners and that the mastery of knowledge and skill requires newcomers to move toward full participation in the sociocultural practices of a community.*

As I describe young people's learning you will find that it often seems to be a process of social participation (Smith, 1999), and that the notion of communities of practice (Lave & Wenger, 1991) fits nicely into my descriptions below.

Society has undergone many changes the last decades. Castells (2000) claims that a new society has emerged due to the changes in relationship of production, the relationship of power and the relationship of experience. Globalisation, the speed of technological development and post-modern values, including individualisation are ingredients presented by others. Whichever way we view history, conditions of living are affected by social change. Those who were born and raised in the beginning of the new millennium have different living conditions than we had and yet tradition

and custom make us the ones upholding and developing educational systems. We could, however, increase our qualifications by studying young people's learning. Levy's (1997, p.15) words can serve as an inspiration to study present-day learning:

> *In the age of knowledge, failure to recognize the other as an intelligent being is to deny him a true social identity.*

Perspective Images

According to the European study Safety, Awareness, Facts, and Tools (SAFT, 2003) 87 % of the children between 9 and 16 years in Sweden have access to the Internet at home. These are interesting figures, but my experience is that we have a tendency to overrate numerical information. Statistics may tell us how common computers and the Internet are in young people's lives, but it is incapable of telling whether IT has transformed their lives in any significant way. In this article I will claim that access to computers and the Internet have changed the conditions of learning and communicating for young citizens. To illustrate this I will not present statistics; I will use stories or case descriptions to communicate my findings regarding contemporary learning models.

Hopefully, these stories will work like perspective images where you have a hard time finding both its images. But once you have found them, you can never go back to not being able to see both. No matter how hard you try, you will always be able to switch between the motives; the old lady and the young girl, or the two faces and the vase. It is a one way road to knowledge. In my research I aim to identify some of these images, that might show us how young people use the Internet and with any luck help us develop knowledge. So in this paper you will find glimpses of young people's use of computers and the Internet.

The first story is about 14 year-old Oliver who came home from a three week vacation last summer. Oliver does not have a group of close friends whom he can call when he gets home. He does not know what reaction he might get; *who cares or welcome home?* Instead, he sits down at his computer and logs on to MSN Messenger. MSN Messenger is one of the most common tools among young Internet users (SAFT, 2003). It is an *instant message* software, used for keeping in touch with friends. Whenever someone logs on to MSN Messenger, their user name is displayed on their friend's computer screens. Now, like some young people, Oliver changes his user name almost every time he logs on. This

time he chooses the user name *Just returned from three weeks in Gothenburg*. MSN Messenger then displays this message to everyone on his list of friends. 20 minutes later, he steps out to meet a friend, because when he advertised his arrival home, someone who knew him contacted him to ask if they should meet. The point is that he was able to advertise his coming home in a more passive and thereby less risky fashion when he used MSN in that way.

This story helped me understand certain things. I understand some of the potential the Internet has for young people; Oliver could never have done an equivalent contact attempt before the Internet. I understand that some people can find an arena for expressing themselves on the Internet; probably other people than the ones who have an arena in real life. I also understand that people influence technology as well as technology influences people, and that the use of technology can take other ways than the ones intended by the inventors; it is not likely that the creators of MSN Messenger could have foreseen this particular effect created by the use of their tool.

Digital Natives

Marc Prensky (2001) introduces the term *digital native* to portray the gap between how adults and young people look upon computers and the Internet. A digital native is someone born into a world where computers and the Internet are natural components. This means that she does not have to get accustomed to this technology by comparing it to something else. Her knowledge of technology is not obstructed by pre-knowledge of something similar.

Digital immigrant is Prensky's name for the rest of us; anyone who was born before IT turned into an integral part of our life. As digital immigrants we will only have second hand information about the technology and its use. The digital native skips the phase where we devote ourselves to meta thinking about this new technology, asking ourselves what it might be used for, what is good and what is bad, etc. Or rather, meta thinking is no option at all. The digital native has a great influence on how the technology is used, simply because she lacks models to copy her thoughts from. The technology itself is transparent and, instead, its use comes into focus (Hernwall, 2003).

Prensky's comparison to immigrants and natives creates a powerful image:

> *Smart adult immigrants accept that they don't know about their new world and take*

advantage of their kids to help them learn and integrate. Not-so-smart (or not-so-flexible) immigrants spend most of their time grousing about how good things were in the "old country."

There is reason to believe that we all recognize the not-so-flexible digital immigrant in ourselves or in people around us. And we might laugh at this and state that there has always been a gap between generations. But I think it is far more serious this time. Bard (2001) claims that the introduction of IT constitutes a fourth information revolution, the three before it being the spoken word, the written word and the printed. An information revolution means that the existing paradigm is overthrown, our familiar structures of power are shaken and entirely new groups will seize power. If this is true, then this gap is not one between generations but between groups of different power levels. I don't want to take this discussion of paradigm shifts too far, but I think it is important to separate the divide between digital natives and immigrants from the generation gap discussions of the past; jazz music, Elvis, comic books, etc. This gap is deeper and more ground-breaking simply because the subject – IT – is more ground-breaking than music styles or fashion in clothing. The challenge for the education system must therefore be to meet these changes in an intelligent way. Prensky (2001) warns us that our educational system was not designed to teach digital natives.

One way of creating a strategy for the future might be to look closer at what goes on among young people. In some cases, drugs as an example, you may do this in order to prevent phenomena from becoming established, in other cases, such as learning, to take advantage of what goes on anyway. Developments in the educational system are carried out by people who are one or two generations older than the students. In respect of changes in society and the speed of technological changes it is vital that we find a way of listening to young people's views of knowledge and learning. The following is an account of what I have come across in terms of young people's learning, divided into five themes. Three themes – *natural learning, informal learning* and *collective learning* – describe aspects of learning while two themes – *openness* and *surfacing* – represent characteristics of computer mediated communication.

Natural Learning

I choose to call my first theme *natural learning*, even though it is risky to use the word natural. The word might draw attention to a

normative conflict between nature and culture, which is not intended here. Instead I use the word *natural* to describe instinctive processes, learning being one of them. Learning seems to be a natural process, in the sense that it does not always require practice; it begins as we are born, or probably even before. Teaching, on the other hand, is something different. It takes skills to teach, not just a steady voice and authority. You might argue that teaching is all about tricking somebody else into learning. You can find good examples ranging from the teacher who lures her pupils into discovering the patterns of mathematics, when they think they are playing with bottle caps and all the way to the novel which, through sense of wonder[3], helps us to understand something new about our world. When a teacher leads the way, or tricks the learner, then she takes advantage of the natural instinct of learning. When we identify such processes we can make the forces of nature work for us rather than fight them.

Enochsson (2001) refers to a little girl who says that the encyclopaedia is ok, but it's not logical, at least not as logical as the Internet. To me this girl opens a whole new perspective. I am reminded of the fact that the alphabet is a construction and does not follow natural learning paths; it is simply a way to organise the letters mnemonically, so that we will remember them easily. When you think about information from her point of view, it becomes obvious; if I look up the word *monkey* in my encyclopaedia, the preceding word is *money*, which is logical once you have internalised the alphabet into your learning strategies. If you on the other hand have not, there is absolutely no connection between the words. Should you find a good webpage about monkeys however, the next word might be *apes* or information about what monkeys feed on. Here the connection is obvious even if you have not cracked the alphabet code.

Informal Learning

No one can study young people's net cultures without coming across informal learning. For the purpose of this article this is defined as learning that takes place outside the educational system. In this respect there is such an obvious gap between the children of today and us. Young people have never seen the tools we had to put up with when I went to school, e.g. the screen we had to use so we would not look at the keys during keyboard practice. Take a look at young teenagers today and you will find that many of them have the correct way of placing their fingers on the keyboard and they will beat most of us at speedwriting. Language

skills improvement is another example put forward by many teachers.

Photoshopping is an interesting phenomenon from a learning point of view. It is common among teenagers to edit photographs, their own or downloaded, using image software like Adobe Photoshop, and then to publish them on the Internet. One example is Elvira, a 15-year old Swedish girl. Elvira has low grades, in fact she did not pass at all in some subjects, among them art. She has received no formal education on computers, digital images or Photoshop. Still, she creates images in this professional tool and publishes them on the Internet. She shares this interest with many her age, as it coincides with the urge to be seen and to try out personality options (Turkle, 1995). Elvira is self taught both on computers and digital images. When she encounters a problem or finds an effect she wants to achieve, she googles for *Photoshop tutorials*, because she has found that the best tutorials are in English. She then skip-reads complicated instructions and works with the tool until she masters it. To further complicate the process, she has a Swedish version of the software, so she has to translate every term. If we keep an open mind we will be able to find numerous examples of informal learning.

Facer et al (2003) describe the differences between children's learning at home and in school and argue that if computers and the Internet themselves are the explanation to the distinction between learning inside and outside school, then this might explain why schools still have problems with incorporating computers into their learning structures. Papert (1994) compares our placing of computers in computer labs to isolating a contagious substance. This might be the case also when it comes to informal learning. Oddly enough, at times we seem to view informal learning not as a resource but as a threat. We actually discuss children's informal learning a lot, but the topic is hidden underneath a thick layer of fear, i.e. discussions about computer gaming[4], the threats of young people's blogging[5] or using web cameras[6].

Collective Learning

What is the optimal publishing date for the Encyclopaedia Britannica? There is of course no answer to such an absurd question. Still, many publishers have occupied themselves with this question. Should one publish as soon as the manuscript is ready, or is it better strategy to wait until Christmas? This was until Wikipedia (2006) and other tools like it came along. Wikipedia is an online encyclopaedia created as a *wikiweb*, a technology that aims to simp-

lify the web in a technical sense and promote collaborative learning. The Wikipedia is created by everyone who wants to contribute. The optimal publishing date for any encyclopaedia is of course everyday, because the learning process never stops. There will always be something else to add to our collection of knowledge. The concept of Wikipedia can be hard to understand at first, just like it can be hard to understand any new phenomenon. The problem is to grasp how an online encyclopaedia, in which everyone may make a contribution, can be of any real use to anyone. The answer lies in the question; it is because everyone can make a contribution. When I contributed to the Swedish version of Wikipedia, I added some new words from my research area and reused the definitions from my website. The next day another Wikipedia user had identified these texts as originating from my website and asked me in Wikipedia's discussion forum if I had permission to copy them.

After this a lot of people have added to the definitions, accumulating knowledge from different angles. I represent the learning point of view, others have deeper technical understanding and put together they are an image of our collective knowledge. Levy (1997) talks of collective intelligence and claims that "no one knows everything, everyone knows something, all knowledge resides in humanity". Another strong point is the need for source analysis. Since anyone can contribute, users know that they have to be suspicious. Source analysis in an educational situation can be a pointless experience, where everyone involved knows that this has to be done, but it is not for real. The exercise is carried out to learn about something that might become useful in the future. The Wikipedia example illustrates the power of source analysis when it occurs in a real setting.

Surfacing

The next theme deals with the fact that the Internet seems to bring some human behavior to the surface. Bullying can serve as an example. Bullying is a problem at every school, and has been a problem as long as we can remember. We might argue that bullying has been institutionalized, since in Sweden every school by law has to make an anti-bullying plan. We know for a fact that some pupils will be bullied when school starts every year. So bullying is an everyday phenomenon, but suddenly it becomes observable; when harassment moves into the Internet and mobile phones, it is actually possible to print some of the incidences and prove what took place. This everyday phenomenon has surfaced.

Thinking of something else during a lesson is nothing new. The difference today is that the activities competing with teaching can be more visible; checking e-mail during a lecture, receiving and reading a text message during a discussion, letting the instant messaging tool work in the background while writing a paper. This surfacing can be addressed in different ways. Some, often early adopters of technology (Cf. Alexander, 2003), think new, bold thoughts and raise the question "Do we really know for a fact that a connected person who is in contact with those she wants to be in contact with is less concentrated than if she is disconnected?" Others put up a fight against what they see as manifestations of disrespect; schools banning mobile phones[7], blogging[8] and online communities[9].

Another aspect of surfacing is the transparency facilitated by IT. Rheingold (2003) tells the story of how he used a friend's hand held computer to scan the bar code of a product, importing the information into Google and in a matter of seconds receiving information about the company, vital for him as a consumer. Rheingold also points out the possibilities in the way that E-bay and other web sites use the rating possibilities. A customer at E-bay can rate the seller's honesty and swiftness to deliver easily, helping future customers to make an informed choice concerning the seller. IT used as extensions of our senses and abilities, helps us find and share information in a way we have never been able to do before. Rheingold's vision of an informed consumer has already moved into learning environments: the ability to rate courses and teachers or get instant information via bar codes and mobile phones. How this will affect teaching and learning we can only guess, but it seems like a good idea to be prepared.

If surfacing deals with the medium as such, the next theme, openness has to do with the users of computer mediated communication.

Openness

There is a candidness that seems to appear when we communicate with the help of IT (Hernwall, 2001). Among young people this openness can be found in online diaries, self-presentations in online communities, etc. The different user names in MSN Messenger is one example, another is the moblogs kept by young people, using their mobile phones to document their activities, sometimes publishing them on the Internet the instant they occur (Dunkels, 2006).

The sad part of the story is that this openness first was identified by adult predators. Long

before the good side of the adult community realized what was going on, paedophiles and other predators understood and exploited its possibilities. When a young girl writes in her online diary that she starves herself or cuts herself, a paedophile can easily start his grooming process by offering to be the understanding adult she cries out for, only to introduce the abuse when trust is established.

There are examples of good people making use of this openness, too. Pia Widegren, a teacher in Motala, uses computer mediated communication to get deeper contact with her students and taking this into the classroom once the contact is established (Datorn i utbildningen, 2003). This method is used by some teachers to address sensitive issues, such as sex education, mental illness or discussing the right to abortion.

Conclusions

There is probably no better way to secure the vital educational task of any society than organising it into schools, but there is close to no debate about the very foundations of school. This is interesting since school is the only public institution that every citizen comes in contact with. All other institutions are optional or might be avoided. So every adult has a relationship to school. And yet, or perhaps because of that, we rarely discuss the very foundations of school. This article has pointed out some features of contemporary learning models, claiming that computers and the Internet have changed the conditions of learning and communicating for young citizens – the digital natives. It has pointed out the fact that the Internet with its hypertext seems to promote learning in a natural fashion and the tremendous amount of informal learning – learning that takes place outside the educational system – that computers and the Internet seems to encourage. It has acknowledged the growth of what I call collective learning – learning that is collaborative and draws on other people's work, constantly adding to our collection of knowledge. The article has also drawn attention to the surfacing of human behaviour that the Internet seems to promote, making it possible to act against negative behaviour such as bullying. Another side of computer mediated communication is the openness where users of net communities exhibit sides of their personalities that traditionally have been hidden from strangers. Many of these features were first detected by commercial and criminal forces in society, which probably is the case wherever something new emerges. This, in combination with the fact that many adults – the digital immigrants – find it hard to understand (Dunkels, 2005b) what goes on on

the Internet can in some cases be to the detriment of young people.

When it comes to new technology it is impossible to predict in which direction it will develop. Thulin (2004) gives an explanation to this difficulty in her doctoral thesis when she describes the intricate patterns of influence that surround new technology. Not only does the technology influence users and non-users, technologies also take different development paths depending on how people use them. This makes it hard to predict the future and what implications computers and the Internet will have on education. However, we can conclude that there seem to be parallel learning environments, where young people learn in spite of educational systems, not as a result of them. What happens when the children I have described grow up and attend higher education? Will they accept that their knowledge of the world and their learning strategies are reduced to nothing or will they find alternative universities? Perhaps, if we could study the learning that literally explodes in our homes and in schools, after hours, and extract some components, then the legitimacy problems of our educational systems might be over. It ought to be possible to let the forces of nature work for us rather than using our energy to fight them. We should discuss how we may integrate contemporary learning models in our educational systems, learn from what takes place anyway and exploit it. Not in a way that infantilizes education or adjusts it to youth culture, but rather study young people's learning and look for keys to the forces behind it.

We have to be careful not to look at the difference between digital natives and digital immigrants as their world versus our world. If we divide life that way we risk handing over too much responsibility to young people, abdicating as adults and teachers (Dunkels, 2005b). Instead we must accept that we share a common world but that we have different competences. There is an example from Bjørnstads (2002) study of young Norwegian Internet users. She talked to them about what I like to call *the worst of the worst* on the Internet; sexual abuse against children and animals, torture, executions, etc. In these talks she identified a small group of teenagers who could not separate what is forbidden or unsuitable for anyone from what is permissible after a certain age. A small group of teenagers actually thought that websites containing the *worst of the worst* are acceptable to visit once you have turned 15 or 18, or whatever age they thought was the limit. This is interesting, because in fact we do not have a group of teenagers running around in the real

world, thinking that murder is ok, once you are 18. So this problem seems to be connected to the Internet. Bjørnstad's findings indicate that no matter how much young people know about this new medium, many of them still need adult guidance.

So we might feel small and stupid when it comes to knowledge of the Internet, but that is a good thing, to realize one's limitations. But we should also understand our strengths. All these wonderful young people with all their incredible knowledge, they still need us. We should appreciate this and start planning for an educational system which embraces these young citizens and builds on all the knowledge we have gathered about learning.

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Footnotes

1 *Questions Pertaining to Fundamental Values in the New Teacher Training Program: a study of ethical and moral dilemmas in a changing world* is lead by PhD Gun-Marie Frånberg, University of Umeå and funded by the Swedish Research Council.

2 At the conference Emerging Pieces of the Education Puzzle in Skellefteå 2005, http://www.campus.skelleftea.se/ep.

3 Sense of wonder is the literary term for a conceptual breakthrough which is common in Science Fiction literature. http://urchin.earth.li/cgi-bin/twic/wiki/view.pl?page=SenseOfWonder

4 Cf. http://news.com.com/Judge+blocks+California+video+game+law/2100-1043_3-6005835.html

5 Cf. http://www.washingtonpost.com/wp-dyn/content/article/2006/01/16/AR2006011601489.html

6 Cf. http://www.nytimes.com/2005/12/19/national/19kids.ready.html?ex=1292648400&en=aea51b3919b2361a&ei=5090&partner=rssuserland&emc=rss

7 Cf. http://news.bbc.co.uk/1/hi/scotland/3524913.stm, http://www.politicalgateway.com/news/read.html?id=3068.

8 Cf. http://www.rutlandherald.com/apps/pbcs.dll/article?AID=/20050329/NEWS/503290316/1027

9 Cf. http://www.dailyrecord.com/apps/pbcs.dll/article?AID=/20051024/NEWS01/510240324/1005