Chapter 29

The Natives are Restless. Higher Education and the Culture of the Digital Natives

In a very short time – some 10 to 15 years – several new information and communication technologies have conquered our offices and homes: the PC, the internet and the mobile phone. Now the classroom is next.

When these technologies started to become important parts of their lives, many adults were baffled by the pace of the changes the new technology brought on, by the new skills they had to acquire to stay on top, and by the amount of information suddenly available at their fingertips. They were also surprised and humbled to see that many teenagers seemed to master and enjoy the new technology in record time.

Apparently, this was a set of important skills that pupils mastered better and faster than their teachers. Recent research shows that this phenomenon was in fact mostly appearance, but it was convincing enough to inspire the term digital natives. The assumption was that the teenagers who were adept in the new technologies had formed a separate culture defined by the language of digital communication and the immediacy and interconnectedness of the internet, and that the development of this new culture had changed their preferred strategies for learning.

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29.1. Digital natives?

29.1.1. *What are digital natives?*

The students arriving at our colleges and universities are frequently described as digital natives. What does it mean to be a digital native and how high is the level of digital literacy among our students?

Marc Prensky coined the term digital native. He describes this new "tribe" as follows:

> Today's students […] represent the first generations to grow up with this new technology. They have spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age. […]
>
> What should we call these "new" students of today? Some refer to them as the N-[for Net]-gen or D-[for digital]-gen. But the most useful designation I have found for them is *Digital Natives*. Our students today are all "native speakers" of the digital language of computers, video games and the internet.

Prensky wrote his article in the United States in 2001. He reported that the "average college grads have spent less than 5,000 hours of their lives reading, but over 10,000 hours playing video games (not to mention 20,000 hours watching TV). Computer games, email, the internet, cell phones and instant messaging are integral parts of their lives." Do we find a similar trend in Norway seven years later?

According to recent statistics, Norway is among the countries with the widest distribution of personal computers, mobile phones and broadband internet.

By the summer of 2007 93% of households with children had a PC and 89% of the same households had internet access. 98% of Norwegians between the ages of 16 and 24 years answered yes when asked whether they had used a PC in the last three months and 83% used a PC every day or almost every day. Corresponding numbers for internet use are 95% (used internet in the last three months) and 75% (use internet daily or almost every day). This means that an overwhelming majority have access to a PC and the internet, but only the 75% who use the internet almost daily behave like true digital natives. The remaining 25% either lack the skills or prefer not to (Statistisk sentralbyrå 2007).

The Citizen Media project (Heim & Brandtzæg 2007 p. 6) analyzes patterns of media use in Austria, Germany and Norway. The report divides ICT users into five categories:

1. Non-users are characterized as spending no time with new media technologies such as PCs and the internet.
2. Average users do not use ICT on a regular basis, only now and then. Their computer skills are not very good.
3. Instrumental users are using ICT as a utility for information acquisition. They have for example a low score on entertainment use but a high score on PC and internet use in general.
4. Entertainment users spend much time on entertainment use, such as games. They have quite a high score on advanced use and a high score on PC and internet use in general. These users are characterized by being relatively young.
5. Advanced users use a wide range of different ICT technologies for a number of different purposes, including programming, downloading and homepage design. Like entertainment users, advanced users are characterized by being quite young.

Norway has 25% non-users, 27% average users, 23% instrumental users, 14% entertainment users and 11% advanced users. Norway is the only country in the sample where a group of advanced users is evident. Groups 4 and 5 are especially interesting here. They make up the most proficient ICT users and are relatively young. Together, they make up 25% of the population.

29.1.2. *Are they all native speakers?*

Young people spend a lot of time with PCs. But does that make them a generation of computer wizards? In the age group 16–24, 13% answer that they do not use a PC every day, but rather once a week, and 17% access the internet about once a week. As many as 17% of households with children have some kind of slow dial-up internet connection rather than broadband (Statistisk sentralbyrå 2007).

In other words, while there are plenty of Norwegian students who match Prensky's description of the digital native, there are quite a few who are not immersed in technology in the way he proposes. In the age group 16–24 years, 25% do not use the internet every day. Almost two in ten are online only once a week. This adds up to a lot of people.

The findings of the Citizen Media report (Heim & Brandtzæg 2007) seem at first glance to support Prensky: 11% advanced users and 14% entertainment users, all relatively young. But relatively young is specified as a mean age of 32 years vs. 45 years in the rest of sample, so these advanced users are not all kids and teenagers.

A recent study shows that 60.9% of students in the United States believe technology in the classroom improves their learning (EDUCAUSE 2007). Even if this is a relatively high number, it still leaves almost 40% who are not convinced that information and communication technology is an indispensable part of their lives.

Based on the numbers above, we propose that not all students are "native speakers" of the digital language of computers, video games and the internet.

Here is an example. Spending a lot of time online does not mean you know how to evaluate or use the information you find. A recent study commissioned by JISC and The British Library (CIBER 2008) shows that young people searching the web for information are facing some problems:

> The information literacy of young people has not improved with the widening access to technology: In fact, their apparent facility with computers disguises some worrying problems. internet research shows that the speed of young people's web searching means that little time is spent in evaluating information, either for relevance, accuracy or authority.

29.1.3. *Prosumer or digital octopus?*

A year ago, *Time Magazine* announced "You" person of the year – that is if you contribute content to the web through sites like Wikipedia, YouTube and other Web 2.0 sites.

The time was right to declare that we are witnessing a media revolution. Their argument (shared by many others) is that media consumers are now also media producers. And so the phrase "prosumer" was coined. But research shows that the number of visitors to sites like YouTube and Wikipedia that actually produce content is very low – around 1 percent (Nielsen 2006).

As we have seen, the prosumer is not representative, not even among teenagers. Yet the web has evolved into being more than a means of content distribution. It is a place to find and organize information. The web user of tomorrow will probably still not primarily be a producer of content, but she will collect, organize and re-distribute it. These information strategies can already be seen among students.

29.1.4. *What about the digital immigrants?*

We have seen that not every student is a digital native, which leads us to question the premise that the digital divide is mainly about age. 76% of Norwegians between the age of 35 and 44 are online daily or almost every day (Statistisk sentralbyrå 2007). People in this age group were grownups by the time the web became part of everyday life, so, according to Prensky, they are digital immigrants.

Even though this group did not have internet access when they grew up, they have been around since the early days of the information age. Many of them have owned a computer since before the digital natives were born. So although many of them do not spend the same amount of time online as teenagers do, they have had plenty of time to lose their accent and could certainly pass for natives.

Prensky writes: "As Digital Immigrants learn – like all immigrants, some better than others – to adapt to their environment, they always retain, to some degree, their 'accent', that is, their foot in the past" (Prensky 2001a). It seems the world has moved on since he wrote this. Not all who are parents or teachers have a thick enough accent to be identified as digital immigrants.

Despite the fact that not all teenagers are digital wizards and not every parent or teacher is left behind by the rapid pace of technological change, the way most young people learn is quite different from what our universities and colleges were built for and our lecturers trained for. Below, we present three examples which will show just how radical this difference can be.

29.2. Web based learning strategies

We have seen that despite growing up with access to all manner of digital paraphernalia, there is a relatively large group of young people who are not at ease with computers and web communication. Lately, a lot of attention has been paid to this group, and a lot of resources are used to try to close the digital divide. Here, we want to take a closer look at the others, the ones who can rightly be called digital natives. What makes them sparkle and how do they learn?

Prensky claims that: "It is now clear that as a result of this ubiquitous information environment and the sheer volume of their interaction with it, today's students *think and process information fundamentally differently* from their predecessors" (Prensky 2001a). In fact, his second article on the theme of digital natives deals entirely with the theme of neurobiology, social psychology and the brains of digital natives (Prensky 2001b; Prensky 2006).

We will not reproduce his arguments here, but take a look at how he describes their characteristics:

– They are used to receiving information really fast.

– They like parallel processing and multi-tasking.

– They prefer their graphics *before* their text rather than the opposite.

– They prefer random access (like hypertext).

– They work best when networked.

– They thrive on instant gratification and frequent rewards.

This certainly sounds familiar. Most people who spend time with teenagers will recognize some of these preferences.

29.2.1. *Learning in virtual networks*

In 2006, Anne Kirah, lead design anthropologist at Microsoft, presented at the NFF conference[1] what she calls real people data, qualitative data about "real people": she lives with a family for days, observes their tasks, logs how they solve them and how technology helps or hinders them.

In France, she met a teenage boy who wanted a new, cool snowboard for Christmas. His parents told him it was too expensive and asked him to come up with an alternative.

The boy was a snowboard enthusiast and it turned out he had an international network of quite knowledgeable peers. He contacted them in forums and on his messenger to ask for advice. Together they found an online store that sold the same snowboard for a more reasonable price. It was still very expensive, though, so they compiled a list of arguments for why this was the right purchase: quality, safety and durability.

The boy got the cool snowboard. Then he and his parents had an explanatory conversation about networking. They had been concerned that he was wasting time in the online networks instead of spending time with what they called his "real" friends. The case of the snowboard had convinced them that his online networks were arenas for learning as well as fun and games.

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1 Her presentation can be downloaded here:
http://www.nade-nff.no/files/2006sommer_hoest/Kirah_People_Centered_Innovation.ppt.

29.2.2. *Digitally proficient students*

At the Online Educa conference in Berlin 2007, researchers Guus Wijngaards and Gunnar Brückner led a session called "Learning in the digital world of teenagers".[2] They organized a conversation with a panel of five teenagers (17 to 19 years old) about their online habits at school and at home.

They all had MySpace and Facebook accounts for networking. They used mobile phones, Skype and Windows Live Messenger for communication. More and more, though, they had their conversations on Skype and used their phones mostly for taking snapshots and recording video.

When researching a subject, their starting point was often Wikipedia, but they were aware that these articles can be biased and they always supplemented their research with a Google search and/or a cellulose based encyclopedia.

One student had spent last year in the UK at a school where all the students had laptop computers in the classroom. He had enjoyed sitting in the back of the class to see what was on the other computer screens. They had messengers and web cams active and would discuss the topic at hand (and other topics, too…) while they listened to the teacher.

29.2.3. *Technologically tentacled teenagers*

The impression of the digitally augmented students is reinforced by an interview at The Infinite Thinking Machine with "Arthus", a 14-year-old student from Vermont (Hargadon 2007). He is by no means an average student or an average user of web technology: he is very young and has a firm grip on most kinds of web technology. He might very well be the shape of things to come.

"Arthus" has a cell phone, but he doesn't text. He doesn't watch TV, but watches some shows online. He listens to his iPod all the time. Outside of school he spends several hours a day using his computer. Still, he feels that his life is in balance: he participates in school clubs and he feels comfortable turning off the computer to do other things.

His school has a good number of computers, and even though they buy new computers every couple of years, they are not used actively in the classroom. This

2 See a short description of the session here:
http://www.online-educa.com/programme_detail.php?id=SCH46.

makes "Arthus" feel that when students come to school their "technology tentacles" are cut off.

His argument is that: "If teachers are worried about the use of laptops in class for things that aren't related to class, then maybe teachers should be thinking about why students wouldn't be paying attention. […] The current learning system – one task, one person teaching – will just not be relevant in the future. And it's not reflective of what college or work life is like. The education system owes it to students to prepare them for that world."

29.3. Teaching the young and the restless

To the digitally literate teenagers we have met above, the web is an extension of their classroom, their bookshelf, their living room. In many ways they perceive the web as a natural extension of themselves: Through PCs, mobile phones, iPods and other gadgets, they are online when and where they want to. They have grown digital tentacles that they use to gather, organize and share information.

In his article *The Outsourced Brain* (Brooks 2007), David Brooks writes:

"I had thought that the magic of the information age was that it allowed us to know more, but then I realized the magic of the information age is that it allows us to know less. It provides us with external cognitive servants — silicon memory systems, collaborative online filters, consumer preference algorithms and networked knowledge. We can burden these servants and liberate ourselves."

Although the article is more than a little ironic, it is obvious that Brooks has acquired and enjoys the same kind of digital tentacles as the teenagers described above, but from his picture we guess that he is in his forties. This supports our claim that digital natives are not all youngsters. And that is a good thing: if our universities and colleges are going to support the learning strategies of the digitally proficient students, we need teachers who are familiar with their tools.

14-year-old blogger "Arthus's" description of himself bears a striking resemblance to those of the 40-something David Brooks. Across the generation gap, they share the joy of growing technological tentacles.

"Arthus" says: "[I]f he had one message for his high school teachers for the next four years: they really need to stop being so disconnected from the technology. It's not about learning the knowledge, but the thinking. […] The teachers owe it to themselves and their students to be learning these new Web technologies." (Hargadon 2007)

Our thesis is that the main challenge is no longer that most students are digitally adept and educators are not. Instead, the situation is that educators, whether their digital literacy is on a high or a low level, need to cater to the different needs of two groups of students: 1) the young and restless, the ones who spend several hours every day online, and this is a large group which keeps getting larger, and 2) the students who are simply not into computers, a group that is not as large as the former, but still shows no sign of disappearing.

The German student in the example above was used to supplementing what the teacher or lecturer says with information from the web and with input from fellow students in real time by way of his laptop. This scenario scares many lecturers, who are used to being the main focus of attention in the classroom. "Arthus's" message to them is: "If teachers are worried about the use of laptops in class for things that aren't related to class, then maybe teachers should be thinking about why students wouldn't be paying attention."

If we take a second look at Prensky's list of digital native characteristics, the three cases all match several of them: they are used to receiving information really fast, they like multi-tasking, they function best when networked, and they thrive on instant gratification and frequent rewards.

So even though the digital natives certainly do not span an entire generation, the digitally proficient students, the 11% advanced users and the 14% entertainment users seen in the Citizen Media report quoted above, fit Prensky's description quite well. The fact that this group is steadily growing is worrying decision makers in the education business.

But as we have seen, digital literacy is not reserved for the young – digital immigrants are not as helpless as Prensky describes them. The advanced users were found to have an average age of 35 years, so not every professor is intimidated by students with laptops in the classroom.

We predict that these digitally proficient lecturers and professors in higher education will team up with their students to transform their teaching, allowing networking and multi-tasking, implementing the teenagers' tools of choice: instant messaging, video sharing, gaming and so on. The older generation may be more inclined to make use of online services like blogs, wikis, image sharing, and the production of web sites, and may also have an advantage as regards search strategies and information assessment.

Working together they can develop a learning environment that makes use of the strategies of both digitally proficient lecturers and students. Combining their skills and learning, they can also achieve what the younger users often fail to accomplish:

choosing the right media for the job and finding the content best suited for the task at hand.

29.4. References

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