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Watch out - the powerusers are coming

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Published in:
Proceedings of the 5th European conference on e-learning

Publication date:
2007

Document Version
Accepted author manuscript, peer reviewed version

[Link to publication from Aalborg University](#)

Citation for published version (APA):
Levinsen, K. (2007). Watch out - the powerusers are coming. In D. Remenyi, & M. Hart (Eds.), *Proceedings of the 5th European conference on e-learning* (pp. 407-414)

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Baby Boomers with Neo-Millennial Learning Styles

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Abstract: The increasing speed and complexity of changes relating to of Information and Communication Technology (ICT) development reaches deep into the structure of societies and peoples lives. Discussions about tertiary education in transition from industrial- to information society often focus on the differences between generations and the challenges the educational system face in order to adapt to new conditions. Today's students are regarded as the new learners and are considered to be fundamentally different from their predecessors in the ways in which they use ICT, learn and solve problems. Thus, it is generally agreed that the four living generations from the 20th century (at least in the western world) – referred to as the Matures, Baby Boomers, X-generation and Millennials – as cohorts in the educational system, differ in ICT-literacy due to their different historical conditions, e.g. culture, society and technology. For example, the youngest Matures and the oldest Baby Boomers grew up with the mainframe computer and had to achieve all their ICT-competencies as adults, while only a part of the Millennials are so called digital natives growing up with wireless and mobile devices as everyday things. These differences lead to the conception that X-gens and Millennials are more ICT- and mobile competent than the older generations, and therefore more easily reshape their learning styles to the advances made in the field of ICT.

The paper presents the two first out of three phases of a qualitative study from a Danish college of social education using blended learning. The students in the study, all of whom are women, are young Baby Boomers but use ICT with a competency similar to the digital natives and display learning styles approaching what Dede (2005) calls Neo-millennian Learning Styles. The study looks into the ways in which these students cope with the virtual environment and the reasons why they are able to bridge the gap between generations.

Keywords: Generation, gender, ICT-literacy, e learning, virtual learning environments

1. Introduction

Since 2003 Danish colleges of social education (Unique Danish pedagogical education aiming at non-school daycares for preschool and schoolchildren) have offered web-based, blended mode educations. During this period it has become obvious that education situated in virtual environments has unique traits. Consequently the web-based education has to be designed differently from standard face-2-face activities. Also, and just as any other education, the pedagogy and didactics of web-based education need to be continuously developed. In order to further ground the development of the web-based education offered at CVU-Sonderjylland, a research project - *Project stud.net* – was started in spring 2006. This project was run in collaboration with the Danish University of Education.

The web-based education at CVU's covers 4 years of study and is designed as standard blended learning with 1/4 Face-2-Face and 3/4 online. The students work in study groups using Blackboard™. From 2005 Web 2.0 technologies outside Blackboard™ were introduced in the education's multimedia course: Skype, Flickr, Google, blogging etc. Most students are adult women (aged 30 to 50) working with childcare either in institutions or in their homes. They typically have their own family and an older, middle range education.

CVU-Sonderjylland had from the start in 2003 continuously performed internal investigations on for example cohort profiles and dropout rates. The findings led to the understanding that circumstances in the students' everyday lives were the pivotal point for their choice of, as well as their problems with, the web-based education. Based on this evidence, *Project stud.net* thus formulated the research question:

How does web-based education correspond with the students' everyday life?

The research was planned in three steps. During the first step, volunteer respondents were asked to write a diary for at least one week on both sides of a weekend. On the basis of the diaries, the same respondents participated in the second step which included a semi-structured qualitative

interview. These steps has been carried out, analyzed and are delivered as a report to CVU Sønderjylland. The findings will form the basis for designing the third step, a questionnaire aiming at a full class in 2007. Based on an analysis of the student profile, it was preconceived in the research design that ICT-skills at a novice level and need for accustomization to a virtual environment would be major challenges for these students. Already the diaries forced reflections on and a reconsideration of the justification of this preconception. Consequently the interview guide was modified in order to challenge the preconception – and it was indeed challenged!

As the informants displayed traits described in relation to younger generations such as X-gens and Millennials (Oblinger 2003, Dede 2005) it became necessary to search the literature to find out whether the preconception was a stereotyped prejudice or it stemmed from a grounded consensus about the relation between ICT literacy, gender and age. In the case of the latter, the students at CVU-Sønderjylland could then be viewed as pattern breakers.

2. ICT Literacy, Gender and Generations in the Literature

2.1 ICT -Literacy and Generations

The relationship between ICT-literacy and generations are often discussed in literature in relation to future challenges in the educational system due to observed or expected differences between teachers and students (see Wagner 1998, Trilling & Hood 2001, Passey & Kendall 2002, Oblinger 2003, Rambøl 2004, Dziuban et al. 2005, Levinsen 2007). While Robert (2005), Oblinger (2003) and Levinsen (2007a) point at the generation gap between teachers with acquired ICT-competencies and students born into a webbed and wired society, and Tyler-Smith (2006) discuss Baby Boomers and Matures in relation to dropout, only few studies compare generations. Some examples of cross-generational studies include the *Pew Internet & American Life Project* (Lenhart et al. 2001) which compared teenagers (Millennials) and their parents (X-gens) in 2000 and how they use IT in both school and work. Dziuban et al. (2005) compared generations (Baby Boomers, X-gens and Millennials) at the University of Central Florida, while Macleod et al. (2002) compared students at the University of Edinburgh in 1990 (Baby Boomers, X-gens) and 2000 (X-gens, Millennials). While the IT-characteristics of X-gens and Millennials generally rest on empirical studies, the IT-profile of Baby Boomers and Matures primarily rest on interpretations constructed from sociological and historical studies. Dziuban et al., describe the generations as generalized types:

Matures (born prior to 1946): Shaped by World War II and its aftermath, believe in an honest day's work for an honest day's pay, and saw the university as an ivory tower.

Technology markers: Trans-Atlantic radio signals, stereo phonographs, and the development of electronic computers.

Baby Boomers (1946-1964): Shaped in a period marked by economic improvements and optimism. Through sheer weight of numbers their impact on present politics, economy, society, and culture is monumental. For the Boomers, the university was a great expectation.

Technology markers: PLATO, fax machine, BASIC computer language, the minicomputer.

X-Gens (1965-1980): Shaped by anti-war protests, inflation, layoffs and environmental worries. They are also the first generation to feel the profound impact of technological developments. They are described as sceptical and mistrustful towards the establishment. Job security is a myth, and university an uncertain mediation.

Technology markers: Windows keyboard mouse, UNIX operating system, Intel's introduction of the microprocessor chips, C-programming language, the foundation of Microsoft, and Apple Computer.

Millennials (1981-1994): Also called New learners, Net Generation and Internet Generation. They take class notes on personal digital assistants, get information from blogs and wikis, and are asked by their professors to turn off their mobile phones in class. Millennials are the most diverse generation in history. They navigate complicated software with such ease that they intimidate members of previous generations. They multitask, but employers report on developmentally lacking basic skill levels, initiative and critical thinking ability. The Millennial generation experiences the university through bricolage.

Technology markers before 1994: PC, the Internet, sound CD, the initial version of Windows OS,

Apple Macintosh, HTML, and e-commerce sites on the Internet.
Technology markers after 1994: Internet search engines, DVDs, MP3 audio, the number of Internet hosts exceeded 172,000,000. Google claimed a database of 4.28 billion Web pages.

The generation profiles support the expectation that generations have different ICT-literacy and that Mature and Baby Boomers are less ICT -literate than X-gens and Millennials. In practice the expectation is empirically supported though the comprehensive e-learning literature from 1990 and onwards, which exposes Matures' and Baby Boomers' difficulties in approaching ICT and online learning, both as students and as teachers. This literature focuses on the need for both in-service teacher training (Laurillard 2002, Salmon 2002 and 2003, Levinsen 2007b) and activities that support students in adjusting to virtual learning environments (Stahl 2000, Salmon 2002 and 2003, Sorensen 2002, Levinsen & Orngreen 2003).

2.2 ICT -literacy and Gender

In the discussion of gender and ICT-literacy, most of the literature addresses the Digital Divide. Within the United Nations, there is a high priority placed on women's access to ICT, e.g. via the *ICT Task Force*. While socio-economic reasons underlie a perspective on gender in developing countries, gender studies in developed countries focus on gender-related strategies and approaches to ICT. Colley and Comber (2003) report evidence of a reduced gender gap in a study comparing 11- 12-year-old and 15- 16-year-old students in the early 1990s and 2000. In this study, girls were more confident with word-processing, graphics, programming and mathematics, e-mail, Internet and CD-ROMs. However, some gender differences were evident, particularly among attitudes. As previously, boys liked computers more than girls and were more self-confident in their use of computer technology. They also used computers more frequently out of school, particularly for playing games. As previously, older girls held the least positive attitudes, and Colley & Comber suggest that their approach to computers may be influenced by the cultural pressures of gender stereotyping. Macleod et al. (2002) report similar findings when comparing cohorts at Edinburgh University in 1990 and 2000. They found that the gender gap was reduced during the period between 1990 and 2000, and that women used computers while men were interested in computing and technology. However, it was among X-gens that the change took place, rather than the Baby Boomers. The gender gap can also be found among gender related possibilities for career choice. Based on this gender gap, Matwyshyn (2003) addresses the gender issue among IT professionals, introducing the concept of *Silicon Ceilings*. Thus, expecting women in general to be less ICT-literate than men is a preconception which is reasonable when referring to women living in male dominated cultures, in poverty or women who are old X-gens, Baby Boomers and Matures.

2.3 ICT-literacy and Age – critical views

Oblinger & Oblinger (2005, p. 17) discuss whether the differences in ICT-literacy are due to age and/or exposure to IT. They find that exposure and experience are more important than age. Also Dede (2005, p. 8) expresses another view on age, claiming that "Overall, the Internet-based learning styles ascribed to 'Millennial' students – those born after 1982 – increasingly apply for many people across a wide range of ages, driven by the tools and media they use every day". According to Dede, neo-millennial learning styles, which may emerge in the future as cross-age learning styles based on "mediated immersion" in "distributed-learning communities", can be described as follows (Dede 2005, Neal, 2006):

- fluency in multiple media and in simulation-based virtual settings;
- communal learning involving diverse, tacit, situated experience, with knowledge distributed across a community and a context as well as within an individual;
- a balance among experiential learning, guided mentoring, and collective reflection;
- expression through non-linear, associational webs of representations;
- co-design of learning experiences personalized to individual needs and preferences;

Other characteristics of the Millennials add to Dede's description. The Millennials experience higher education through bricolage, access the world through the Internet and bring it into the classroom. They see teamwork as knowledge, like blended learning, but find that the teachers are not all competent (Dziuban et al. 2005). They cannot imagine living without the Internet (Oblinger & Oblinger 2005).

2.4 Summing up the Literature study

The literature in general supports the initial preconception in the CVU-Sonderjylland study, that Matures and Baby Boomers - especially women - may be expected to display low ICT-literacy. Some authors question the importance of age and suggest the significance of exposure to and experience with ICT in practice.

In the next section, the study is presented, regarding the findings of pattern-breaking behaviour that allows for an interpretation of the students in the study as Baby Boomers with neo-millennial learning styles.

3. The CVU-Sonderjylland Study

Only few studies refer to adults studying while having a job and a family. Oblinger (2003) and Tyler-Smith (2006) found that students in general are older than 10 years ago, most of them have jobs and quite a lot have family obligations. Tyler-Smith found that dropout can be related to increased external obligations. In a 5-year longitudinal study among nurse distant learners (1996 – 2001) by Price (2004), he found that women were more vulnerable than men to part-time study-related stress. Women would often rely on family and friends to support them in relieving some of their duties. However, due to distrust they were often found to take back these duties. The families were found to protect the women in the time preceding assignment submission. In relation to studying, the women heavily sought support from higher educated lay supporters in their environment. Findings in this study are similar to the CVU-Sonderjylland study regarding the stressful relation between everyday life conditions, education and gender. However, the studies differ as Price did not look at ICT-literacy and the CVU-Sonderjylland students did not rely on lay supporters.

As mentioned above, CVU-Sonderjylland had from 2003 continuously performed internal investigations on cohort profiles and dropout rates. Consequently, the key to pedagogic and didactic development of the web-based education was sought in the field of tension between design and organisation of the education on one side, and on the other side, the study-conditions understood as the interplay between study, work and everyday life. Based on these understandings, the study focused on web-based education in relation to the students' everyday life.

Six students volunteered but one had to withdraw due to personal circumstances. In order to get as close as possible to the students' everyday lives, they were in phase one invited to write a one-week's diary - framing a weekend - including anything they found to be important, such as planning, changes, unexpected events, duties, and leisure time. The diaries were written in MS Word and delivered by e-mail. Below is an example of the instruction to the respondents:

E.g.: drove by car to my job from X-ville at Z o'clock to Y-ville where I arrived at X o'clock.

You can add comments and reflections:

E.g.: It took about ½ hour more than usual because of the snow, but then I got this great idea.... I must remember to ask the others in the blog.

The analysis of the diaries formed the basis of the semi-structured interview guide in phase two. The students were informed about some of the findings and invited to elaborate on those themes and other aspects they had on their mind. The interviews of approximately one hour's duration were conducted though Skype, recorded and transcribed. Both diaries and interviews were analyzed and categorized using Grounded Theory Methodology and *Atlas tii* software. In the following, only the findings regarding pattern breaking behaviour are presented and discussed.

4. Findings

The analysis of the dairies identified important themes that were investigated further in the interviews: 24-hour cycle and everyday events, leisure time, family, job and study, homework, and deviations. In these themes the findings in general followed Price's nurse study. However, indications that these women did not entirely match the preconceptions about ICT-literacy and

study competencies became visible during the analysis. They were found to be highly competent multi-taskers and ad-hoc planners who had easily adjusted to the virtual environment. They were technically competent: they installed applications, defragmented hard drives, scanned for viruses and removed cookies. They were also persistent when solving technical problems, trying hard before seeking help, as this extract demonstrates:

"4.22 pm, Mediator to one of my kids who stops (daycare) tomorrow. 7.30 pm about going postal, I cannot save the file! Call X from my class. She can't help me. Colleague's husband is a genius making CD's to his kids – if I come over he will help me. No car! My colleague is sweet and picks me up. Quick home again, now it's 9 pm."

They used ICT in a complex way and arranged their homes and daycares in a way that made Internet and computer access possible everywhere and at all times. For example, one always had two pc's working simultaneously - one was used for writing and surfing while the other was used to render batches of digital photos for the study, personal blog and job. One described how she, on her job, inspired kids to make their own blogs, and yet another how she used mobile phone and wireless when she was outside with the day care kids. This high level of ICT-literacy led to the hypothesis – inspired by Oblinger & Oblinger (2005) –, that these women had been exposed to and experienced ICT at an advanced level. The interviews therefore focused on: Why they had chosen an online education? What were their prior expectations and their ICT-literacy? Why did they chose a course on multimedia and web 2.0?

Questions on motivation and prior knowledge produced the first surprise. While the respondents all had reflected on the possibility of further education, neither had really focused on realising the idea. The decision was made both impulsive and at the last minute. Some had seen an add on TV or in the local newspaper, while one was wooed by a colleague

"... it was in July and then it definitely went fast ..."

They had no prior knowledge about e-learning or online environments, nor did they know what to expect. They had just seen the offer as *the* realistic educational alternative in their personal situation.

Questions about ICT-literacy produced the second surprise. The women's ICT-literacy differed but they had no experience with virtual environments and the related forms of communication. They considered themselves pixy book-level users of e-mail and text-editor-as-typewriter. These skills had been acquired years ago in middle-range educations. One reported that she bought and began to use both a computer and wireless for the first time in her life only three days before the course began. She had nobody to ask and managed to set-up the all the equipment on her own.

The third surprise was that despite lack of experience, none found it difficult to get used to the virtual environment. The major challenges had been to type fast and to get rid of unnecessary words when communicating:

"I just trained ... all those unnecessary words ... I just said inside my head: Away with them ... they just take space"

They all had experienced misunderstandings but they felt it was only natural. In general they spoke about the written communication in the virtual environment as if it was a face-to-face conversation:

"... in the beginning one said to me 'you write as you speak' "

"...then I could feel if there was a smile or not"

" So, I can almost see their facial expression for my inner eye, in the way they write"

One reported that when participating in the threaded discussions in Blackboard™, she just did what she was used to when talking to people.

When asked about their study they also resembled Dede's, Dzuiban et al.'s, and Oblinger & Oblingers' description of Millennials and neo-millennial learning styles. Like Millennials, they found

that several teachers were unfamiliar with and insecure in the virtual environment. These teachers created impractical environments in Blackboard™. They were difficult to understand, produced time-consuming misunderstandings, and stopped discussions with comments that were beside the point. The women found it odd that being online was difficult for the teachers. As one put it:

" Because you know, it's not that the web-making is difficult, it's the planning!"

When asked to elaborate on the issue of planning, the respondents pointed at the mismatch between the education's claimed flexibility in ads and on the website, and the reality of fixed times for synchronous discussions and assignments that did not fit in with having a job. They also pointed at the relation between online periods and the seminars.

"... in there we were fed with theory we could have read at home in advance, instead of using the time for discussions or more practical exercises."

They all reported an intuitive approach to Blackboard™ while not using the manuals, and they were quick to start using less impractical alternatives, e.g. Skype, Messenger and e-mail. When collaborating on group assignments, they said "we just ping-pong the text". The ease of becoming accustomed to the virtual environment became even more visible as one respondent reported her participation in "...a real online group, with one in the US, the Faroe Islands, Randers and then me in Esbjerg". In this way they also share traits with Millennials such as fluency in digital media and choice of resources, and the idea that "teamwork is knowledge".

When asked why they had chosen the multimedia course, some reported that it was accidental while others reported that it was a deliberate choice. However, they agreed that acquiring competencies regarding multimedia and web 2.0 was important for their future career because it is a natural part of the everyday lives of children and teenagers:

"All kids in the after-school centre, they know all about computers ... it's necessary to be able to use a computer today."

And also they found that ICT and digital media possess pedagogic potential:

"... it's a pity, they have computers in the institutions, but they do not use them ... it's a pity even if it's just the small kids."

"All kids could benefit from this ... Flickr, Blog, image- and sound processing etc. "

When finally asked about how they use the web 2.0, they reported on how they participated in other peoples' blogs, made their own blogs though sampling, and used various applications together with all the things they surfed after:

"... I walk about in other *del.icio.us* looking for good links and 'steal' whatever I can use."

They agreed that even though it is necessary for their family life to turn off the computer, they always felt an urge to go online "and just check", and they found it hard to be without the Internet. For example Annie and Betsy "happened" to blog when they were together and did not study – consequently they had to spend Saturdays to fulfil deadlines and blogging was not allowed!

These findings demonstrate that these women do not fit into both the general interpretation of the relation between ICT-literacy, gender and generations, and Oblinger & Oblinger's assumption that exposure to and experience with ICT in practice is more important for ICT-literacy than age. Furthermore, just as these women disassociate themselves from their ICT-illiterate teachers, they also disassociate themselves from their future colleagues whom they find do not meet the needs of the young children and ignore the importance of acquiring high level ICT-literacy.

5. Discussion

The CVU-Sonderjylland students adjusted to the online environment with a natural ease similar to the Millennials. They did not even display the problems which were found among university students the same age, despite the fact that they were not online-ICT-literate from the beginning.

These findings raise questions such as: Why do these women become pattern breakers? Can we learn from them to meet some of the challenges of the information society?

All respondents in the study presented themselves as highly motivated towards their education goals. Even though they started impulsively and unprepared they claimed that given the choice today between preserving their present living standard or completing their education, they would choose education before income. According to Clark's *CANE model of motivation to learn and to work* (1999), the correlation in the model between age and motivation corresponds to the CVU-Sonderjylland students. While Millennials tend not to commit if they are not motivated or do not see the point, Baby Boomers who recognize the value are motivated and tend to fight any barrier. However, a one year longitudinal study from 2002 of the *Danish Master in ICT and Learning* (MIL) found that students' initial degree of motivation did not correspond with their ability to carry through the education (Levinsen 2005). The same was found to be the case when correlating the MIL students' prior ICT-literacy with their ability to complete the education. In the MIL study it was found that some students who had been forced by employers or felt that they had to educate themselves in order to improve their chances in the job-market became motivated over time, while other students who started highly motivated ran into problems. Thus, the MIL findings confirmed that motivation is important, but also that de-motivation occurs. When looking into why some were motivated while others were not, it was found that the prior experience in relation to communication and teamwork - e.g. negotiation of meaning and distributed decision making - were more important for the motivation and ability to participate in a virtual environment than prior ICT-literacy.

6. In Conclusion

The MIL study found that significant factors affecting the completion of the education were the students' experience with teamwork and their communicative competencies. These findings raise the question whether the CVU-Sonderjylland students were especially well-equipped regarding communication and teamwork. The initial research, diaries and interviews do imply that this may be the case. The CVU-Sonderjylland management reports that people seeking this kind of education "love to talk all the time" during the education and on the job. In other words, communication is a profession-signifier. The students explained how the transfer to the virtual environment did not trouble them in the least because writing or talking made no difference to them. They just did what they were used to. Another characteristic among these women is that they all come from small-town traditional societies where oral communication, collaboration and knowing about each other in the neighbourhood are all naturally integrated in their everyday lives and culture.

These traditional qualities resemble Millennials' behaviour characterized by teamwork, fluid communication and differentiated use of ICT. Perhaps these traditional qualities constitute the source which invites the CVU-Sonderjylland students to become pattern breakers? This perspective will be pursued in the third step of *Project stud.net*.

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