

Homo Zappiens and the Need for New Education Systems

Wim Veen

Delft University of Technology
Faculty of Technology, Policy and Management
The Netherlands
w.veen@tudelft.nl

Introduction

Future students in higher education belong to a generation that has grown up with a PC mouse in their hands, a TV remote control, a mobile phone, an i-Pod, a PDA, and other electronic devices for communication and entertainment. Technology has changed dramatically the way nowadays' children live, computer games, the Internet, MSN, wiki's, and blogs being an integral part of their lives. Today, the average college students in the USA have spent less than 5,000 hours of their lives reading, but over 10,000 hours of playing games, not to mention the 20,000 hours of watching TV (Prensky, 2001). But the use of mass media is declining in favour of being online communicating with peers, searching for information, and using the net for fun (Wijngaards, 2006). In a country such as the Netherlands (16 million inhabitants) 87 percent of the kids between nine and fifteen years is online on a daily basis. Six million kids send more than 25 million messages a day through MSN (Microsoft, 2005), and children are exposed to around 8.000 brand images and icons a day (Lindstrom, 2003). They influence their parents what to buy or not to buy on the basis of what they have learnt on the net. It seems we could speak of a special generation, or even more than that, a Homo Zappiens. Surveys of kids' behaviour tend to say that children learn much from computer games and from communicating intensively online. But parents and educational institutions complain about this generation and many think that all these technology gadgets and software is a waste of time, damages health and leads to social isolation. In addition, many state that these kids know far less than parents ever learnt at school. This article takes a positive view towards this Homo Zappiens and tries to explore the socio-cultural, technological and economic backgrounds that underpin the up rise of this new generation. It also describes the consequences for our education system that seems no longer to meet the needs of Homo Zappiens or that of the future knowledge intensive society.

Driving Factors for Change

Three major determinants are at work for changes occurring in our education systems. They are socio-cultural changes, economical changes, and technological changes. These changes are interdependent and act in parallel over time. We will subsequently describe these three forces of change.

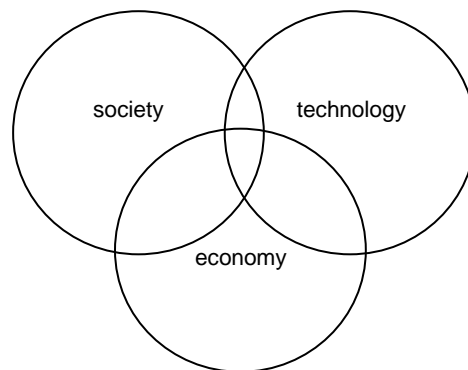


Figure 1: Major factors influencing education systems

Socio-cultural Changes

The ways how human beings communicate, collaborate and process information are critical issues in a society that depends on the production of intangible goods and services. By the end of the eighties of last century children were born in an advanced technological environment. Homo Zappiens represents a generation that was born with a PC mouse in its hands and a computer screen as a window to the world (Tapscott, 1998). This generation has grown up with technology and learns through computer screens, icons, sound, games, exploration, questioning others, and show non-linear learning behaviour.

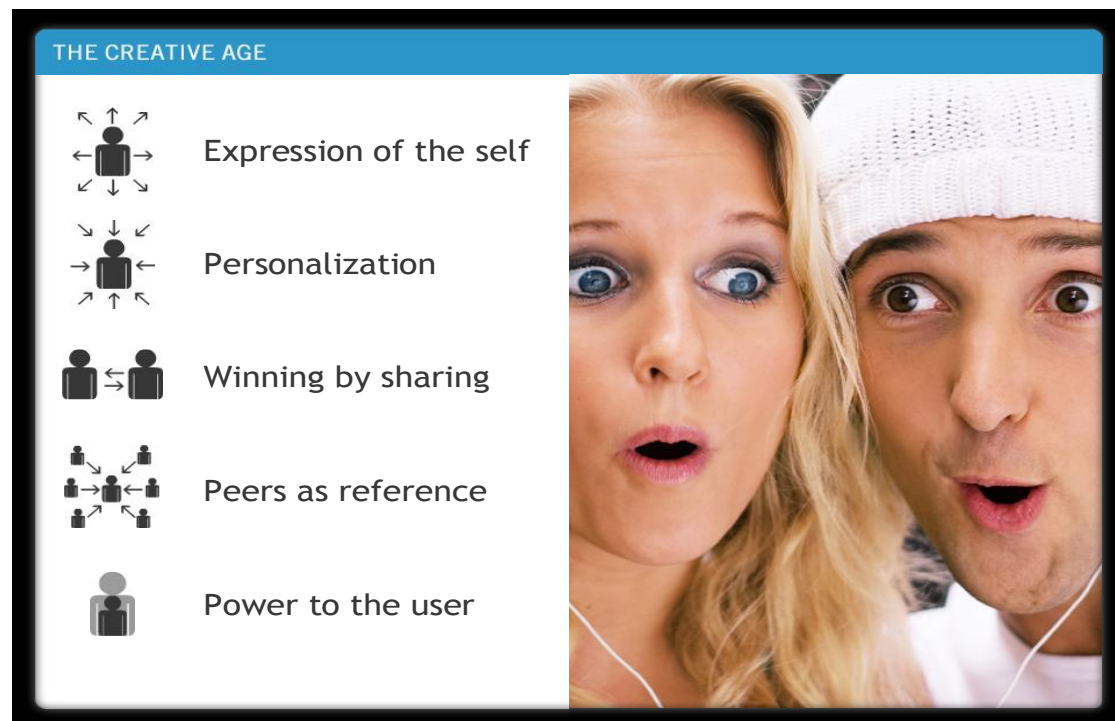


Figure 2: Homo Zappiens adopting new values contrasting with those of former generation, and preparing for a creative and chaotic society

Homo Zappiens is playing video games. Games are immersive, demand proactive players who solve problems, and provide an environment in which children can experiment with a variety of roles. Homo Zappiens communicates using tools such as MSN, chat rooms and cell phones. The average number of MSN windows children use while communicating is 10. And at the same time they listen to their favourite play list (Veen, 2003). In chat rooms, Homo Zappiens uses different electronic personalities (Turkle, 1997), here again they experiment with social roles. And when watching 4 or 5 TV channels at a time Homo Zappiens knows how to find the essence of each of the programs and construct meaningful knowledge out of the various TV programmes (Rushkoff, 1997).

Homo Zappiens has learnt to deal with information overload by clicking and zapping. It has learned how to navigate efficiently and effectively through information, how to communicate, and how to build effectively on a network of peers. Experiencing these digital information flows, kids develop an exploratory learning approach trying to give meaning to the information provided. In particular, games seem to stimulate this exploratory approach as kids often start gaming without knowing the ultimate goal of a game (Gee, 2003; Goodson, Lankshear & Mangan, 2002). Instead, they define their own goals, finding out the available tools and defining the appropriate strategy to achieve their goals. Through this exploratory approach kids develop a number of meta-cognitive skills directly related to learning. Homo Zappiens is a self directed learner, an experienced problem solver and communicator. It seems that as a consequence of the uses of technologies, Homo Zappiens has developed new values contrasting with those of former generations. These values relate to an openness to share, to a different view on the importance of money and fun, to the willingness of self expression in virtual worlds, and to the role of individuals in organisations (Himanen, 2001). These new values have resulted in a

worldwide movement of developing social software, Linux as a first example of these applications, followed by many others (Moodle, Drupal, LAMS, Skype, etc.).

Homo Zappiens has shown a different behaviour in dealing with information and communication. Typical characteristics that are related to learning are shown in figure 3. What appears crucial here is that learning has evolved from an individual activity of internalizing knowledge towards a social process of externalizing knowledge. Although educational theories have stressed this social activity of learning even before technology became predominant in the lives of young learners, it is through technology that humans have now become nodes in technical networks.

<u>Homo Zappiens</u>		<u>Homo Sapiens</u>
high speed	<	> conventional speed
multi tasking	<	> mono tasking
non linear approaches	<	> linear approaches
iconic skills first	<	> reading skills first
connected	<	> stand alone
collaborative	<	> competitive
learning by searching	<	> learning by absorbing
learning by playing	<	> separating learning and playing
learning by externalizing	<	> learning by internalizing
using fantasy	<	> focused on reality

Figure 3: Characteristics of Homo Zappiens and former generations (based on Marc Prensky)

Economy

Economies are evolving from producing tangible goods towards producing intangible goods or services. In addition, production systems become global and labour differentiation takes place at a continental level. Examples of global educational services are Indian companies offering math learning for primary education worldwide, providing both online content and live guidance, using VOIP. Currently, new programmes are being developed for higher education in virtual worlds such as Second Life. Dutch employees working at Korean Airlines have avatars in a virtual office where they easily can stay current with their colleagues worldwide. These changes seem to be irreversible, the world economical balance of power changing profoundly in the coming century. European economies will continue to depend on knowledge intensive industries and as a consequence the labour market will rely more and more on knowledge workers. The evolving European economy needs employees who are not only able to reproduce knowledge but who are also able to create knowledge. Creating knowledge demands learning at the level of synthesis, it includes learning strategies such as association, making new combinations, and the ability to redefine a problem from an opposite angle or point of view. Can the current education system respond to the needs of the new generations' learning approaches? Can schools respond to the challenges of a rapidly evolving information society? The basic design of our schools has been rooted in Taylorism. The organizational structures of industries were based on hierarchy, mass production, standardization, planning and control. The same structures have been replicated for governmental, health and education systems. Although the industrial era has gone and the services oriented economies have undergone profound changes due to the uses of information

technology, schools have continued to survive the way they have been designed 150 years ago. It must be said; schools have been very adequate institutions in the industrial era, however nowadays we should classify them as industrial archaeological museums. For a society that is heading for a new era in which creativity is critical for surviving in a growing global economy, our education systems need to be redesigned. The ‘chalk and talk’ lectures, whole classroom teaching, standardized curricula and examinations, and age-based groups still being the mainstream organizational structures, are inadequate for today’s needs. And a growing number of parents do know this when they realize that their kids are in schools which they recognize so well from their own childhood. We did design the adequate education system for the industrial era, why should we be reluctant to redesign it for the upcoming creative society? Western countries have invested huge amounts of money and effort in restructuring their old industrial economies into modern service oriented societies. Isn’t it strange we did not the same with our education system?

Technology

Technology is the third major change force that coincides with the above-mentioned change factors. Research on IT and ICT uses in the corporate sector has shown that the growth of technology follows a natural S-shaped curve, consisting of distinct stages from scratch to maturity (Nolan, 2000; Rogers, 2003).

If we take Nolan’s stages theory and his three eras of organizational learning, and we transpose these theories onto the educational sector, we may perceive similar eras. Where the micro era can be compared to computer based training, the network era can be compared to online learning. If we take learning-on-demand into account a third S-shaped curve can be indicated. And if we consider social and economical trends, such as lifelong learning, digitization of libraries, virtual universities, flexible and ubiquitous technologies, these may give us a fourth S-shaped curve, which we will call learning mall (see figure 4).

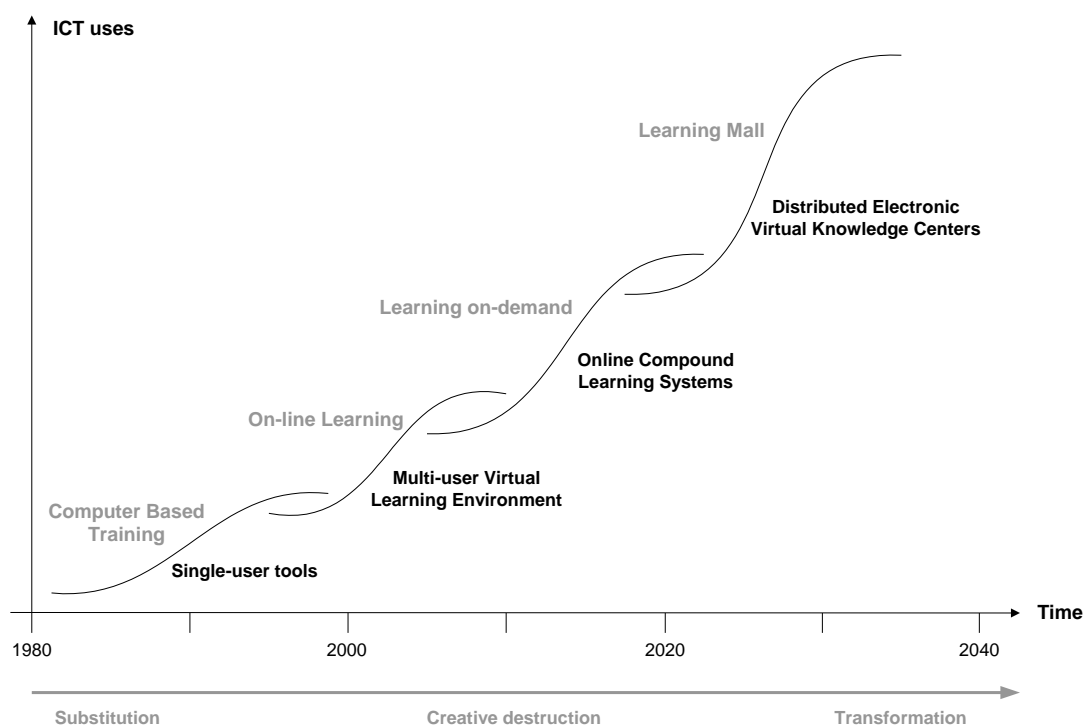


Figure 4: Successive Stages of Educational Technologies and Practices by Piet van der Zanden and Wim Veen, 2004

The time axis represents the period from 1980 to 2040; moving from the first widely used computer applications within education to the complete implementation of a learning mall of the future, where any desired or required information object can be obtained online. The time axis also represents the learning material, which is constantly fragmented in a creative destructive way and gradually transformed into complete independent online learning materials. Learning materials will be shaped as information objects, to be aggregated within different contexts to new knowledge.

Computer based training represents a period of single-user tools in which the computer made its entrance within education and was brought into use for mathematics, computer-aided design, simulation programs, infinite calculation methods, writing, and presentation skills.

Online learning represents multi-user tools, such as communication tools, the World Wide Web (WWW), streaming video and a virtual learning environment for online courses. Lecture notes were digitized and put online, as were video snaps together with references to publications that could be reached via hyperlinks.

Learning on demand represents the next generation web based oriented virtual learning environment where learning material, which is broken up into specified learning objects, is initially distributed online for regular educational tracks.

The curve indicated as the learning mall represents distributed electronic virtual knowledge centres equipped with personalized-learning delivery robots. Student, undergraduates, graduates, post-graduates and other experts will have access to these future distributed online repositories and depositories where 'just in time', 'just enough' and 'just for you' information objects can be retrieved. In this era individuals will be represented in multiple virtual identities that are retrievable in exactly the same way as resources. In fact, human beings will act as parts of social and technical networks. Social networking will be a major activity for knowledge construction.

Four Changes

Many school managers and school boards do currently recognize the need for fundamental changes in schools and education systems at large. Some of them have already started revolutionary experimental schools. First results from these schools show that students love the new approaches that have been adopted and that learning results are satisfying. In the Netherlands, a variety of innovative schools have started recently to work along new lines. In addition, parents who no longer accept traditional schools have started schools that are based on the ideas and ideals of the Sudbury Valley School in the USA and the Summerhill School in the UK. When comparing these educational experiments it is interesting to see that all of them have adopted four major organizational, pedagogical and curricular changes (see figure 5).

<i>Traditional Schools</i>	<i>Experimental Schools</i>
⌘ 50 minutes lectures	⌘ 4 hours periods
⌘ Subject matters	⌘ Interdisciplinary themes
⌘ Classrooms for 30 students	⌘ Working areas for 1 to 100 students
⌘ Age based groups on a yearly basis	⌘ Continuing individual learning paths

Figure 5: Major characteristics of traditional and future schools

From figure 5 we may see that the underpinning principles for new ways of learning appear to be self direction, challenge and immersion. Students are supposed to work independently and collaboratively on themes rather than on traditional subjects, using technology extensively. Individual learning paths are adopted sometimes organized within learning contracts. Assessment is no longer the teacher's responsibility only, it is also the learner's responsibility. Using digital portfolios students are supposed to show their achieved competences. For their learning, they are challenged to solve complex problems that are relevant to them and authentic, and they are challenged to come up with creative solutions.

Conclusions

We think that pressure on our education system will grow substantially. On the one hand, industry will stress the need for employees who will meet the challenges of contributing actively to the business

goals. This pressure from industry will in particular play its role for secondary and higher vocational training. Industry demands employees who are pro-active and competent to learn and relearn, and schools will have to respond to this demand. On the other hand, the education system itself will experience difficulties in keeping up the old teaching methods for students who think schools and traditional training is irrelevant to them. In particular, in general secondary education, pressure will grow as repression seems to be the only answer of many schools to affront current student 'demotivation'. Politicians and schools will have to cope with these pressures by making choices in teaching and learning practices that meet the needs of Homo Zappiens. Governments are to implement educational policies that will give much more freedom for the stakeholders in the regular 'educational market' to adapt to the needs of industry also. These policies should give way to an educational market that is able to respond to these new needs and as a consequence, will probably evolve towards a sector consisting of institutions providing a variety of teaching and learning services from which parents can choose and industry could develop close relationships with. It is beyond doubt that technology will play a major role in this future educational scene. There is an urgent need to design new education systems by looking ahead instead of inventing the future by looking backwards and hold to norms of the past.

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