EDUCATIONAL TECHNOLOGIES ORIENTED TOWARDS CALM TECHNOLOGIES

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Abstract

The massive investments made in information technology and communication development have been beneficial for all the world's economies. All the economic and social processes now rely on computers as their support/intermediary. The technological miniaturization and steady performance increase has resulted into the abandonment of classical technologies in educational field and the extensive use of information technologies. The focus of this paper is to insists on the contribution that the new educational technologies may have on deculturalization minimization and on the former's turning into calm technologies.

1. INTRODUCTION - THE INCREASE OF LACK OF CULTURE OF HUMAN SOCIETY IN THE NEW ECONOMY

In the modern acceptation, we may speak about a knowledge-based society ever since the use of computers in economy, and this happened after the building of the ENIAC in 1947, more specifically in the second half of the 1950s. J. Naisbitt [Naisbitt, 1989, 1-25] places the beginning of the information-based society at the middle of the 50s, when the number of white collars exceeded that of the blue collars in the United States, and also the number of farmers, of people working in the field of services and of factory workers, in 1976.

In some words, we could say that the information society is the society based on information and that the society based on knowledge is the society based on filtered information.

The knowledge-based society involves [Draganescu, 2003, 23-27] a new economy in which the innovation process becomes instrumental. The new economy will be more and more based on information and communication, which presupposes the use of information as a production factor, the recognition and the extension of the virtual goods (assets).

After a thorough analysis, Eduard Cornish, in his work entitled "*Futuring. The Exploration of the Future*", mentions that the evolution of society is circumscribed to the three major technological evolutions, namely [Cornish, 2004, 33-36]: the agricultural revolution,

the industrial revolution and the cybernetic revolution. Concerning the last revolution, Cornish considers that six super-trends will mark the future, namely: technological progress; economic growth; improvement of people's health; increase of mobility; decline of the environment; increase of lack of culture.

Following a punctual analysis, we may assess that the first 4 super trends are favorable to the evolution of mankind, whereas the last two constitute major disadvantages and involve costs that mankind will have to pay.

We insist upon the idea that one of the common points of the six super trends is education, the foundation of the training of the people that create technologies which generate the increase of mobility and economic growth with direct implications on the improvement of their health, in the context of the decline of the environment and the increase of lack of culture.

In other words, people's education will be the "advantage" of civilization, which will be able to influence the quality of the developed technologies, the type and structure of economic growth, with direct effects on mobility, economic growth, and health, as well as on the decline of the environment and social lack of culture (see the "socio-technological" snake in figure no. 1).

Figure no. 1 "Socio-technological snake"

The key of success is the limiting of the two cost super trends (colored in red in figure no. 1) that must be borne by mankind in relation to the decline of the environment and the worsening of lack of culture, which could be attenuated via the technological orientation towards the so-called calm technologies.

2. SOME IDEAS ABOUT CALM TECHNOLOGIES

The concept of calm technologies was created by Mark Weiser in 1991 in the article entitled "The computer for the 21st Century". In 1995, Mark Weiser and Seely Brown worked together to elaborate the "Designing Calm Technology".

The principal idea of calm technologies is that computers should disappear into the „background" of our architectural space and easily switch between the centre and the periphery of our attention much like ambient displays.

The main characteristics information and communication technologies should have in order to be considered calm technologies are the following [Tugui, 2004, 2-6]:

- calm technologies shift the focus of our attention to the periphery;
- a technology is calm when it increases peripheral perceptions;
- technological connectivity to "locatedness".

3. TOWARD VIRTUAL EDUCATIONAL TECHNOLOGIES

In generally, by technology we understand a practical application with the purpose of achieving the targets for specific activities. As concerns the educational technology, we must understand that the technologies support the educational process and the learning process itself. The term refers both to educational, analog technologies, such as clay tablets, blackboard, chalk boards, books, photos, audio, writing and drawing tools, movies, classic tools of computation, etc., and to digital ones, such as e-tablets, tablet-PC, e-books, e-recordings, video projectors, educational software, educational games, multimedia presentations, e-learning platforms, digital libraries etc (http://edtech.twinisles.com/rb/).

In our days computers have become basic tools used by humans in all their activities, as final users, by means of specific interfaces. Currently, there is a hidden tendency towards miniaturising and the expansion of the use of technologies in all socio-professional fields and activities, including education, so as to reach the level of omnipresence and "invisibility" which would meet the object of being calm technologies.

At the same time, the information and communication technologies, together with the discoveries of new materials, shall lead to the so-called Cyberspace, the spine of which will be the INTERNET and the virtuality through digitization.

Regarding the next 20 to 25 years, human society dominated by the digital economy will be subject to the following predictions made by experts of the American organization World Future Society (http://www.wfs.org/forecasts/):

- The Race for Genetic Enhancements Will Be What the Space Race Was in the 20th Century;
- Water Becomes the New Oil;
- WiMAX Networks Will Soon Create Country-Wide Wireless Internet Access WiMAX (Worldwide Interoperability for Microwave Access);
- By 2025, the Worldwide Average Life-Span Will Be Extended by One year Per Year;
- Bioviolence Becomes a Greater Threat;
- Invention Becomes Automated;
- Japan Dominates the Race for Personal Robots;
- Holographic 3-D TV;
- The 'Holy Grail' of Computers Becomes a Reality;
- Electric Cars Become Fully Practical by 2020;
- Religion Growing in China while Secularism Grows in the Middle East;
- New Oil from Old Wells;
- Green Gold: Algae's Huge Potential as Biofuel;
- Nanotechnology May Alter the Value of Diamonds and Other Precious Commodities;
- The Millennial Generation Will Have Major Impacts on Society;
- Quantum Computers Revolutionalize Information Around 2021;
- Breakthrough DOUBLES Solar Energy Output;
- Consumers Will Take Active Roles in Inventing New Products and Services;
- Virtual Education to Enter the Mainstream by 2015;
- Genetic Research May Soon Conquer Most Inherited Diseases.

The special attractiveness of the virtual environment is sustained by over 300 million teenagers under 20, very active in the virtual world on social sites and who will shortly become adults with experience as advanced users of IT&C, because the virtual environment is

accessible to simulation, training, modeling, knowledge acquisition for various projects in fields such as medicine, banks, financial institutions, education and others.

Education will be directly and indirectly affected by the tendency of super-engineering and superficial training, with direct effects on the culture level of people. We consider that a significant contribution in avoiding this effect is brought by the technological level and the performances of the educational technology with a computer support, once the education virtualization ends, as the educated population is more receptive and even dependent on information and communication technologies.

4. EXAMPLES OF VIRTUAL TECHNOLOGIES

In this paragraph we will discuss some educational technologies that describe the level of virtualization reached at this moment in education.

a. Modular Access to Electronic Handbooks: This is a modular access project for users of electronic books such as Handbooks, with the name LoLaLi, the short for "Logic and Language links" (http://remote.science.uva.nl/~caterina/LoLaLi/) [Caracciolo, 2003, 3/3] and [Harmsze, 2004, 112-117].
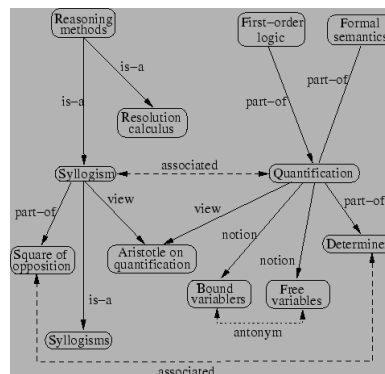

Figure no. 2 Graphical representation of a fragment of the LoLa hierarchy

b. Virtual worlds: Virtual worlds are online environments where multiple users can interact or where the characters or environments are interactive. Users participate in the world through the control of an avatar or online persona. An Avatar allows a user to choose how much of their real self they wish to portray in the virtual world, potentially allowing them to act as completely different people
(http://designing.flexiblelearning.net.au/gallery/activities/virtual_worlds.htm).

c. Intel Technologies: The Intel Company research fields also support educational technologies (http://techresearch.intel.com/ResearchAreaHome.aspx), the closest of the former being the following: BioComputing; Cultural Anthropology; Mobility; Networking; Photonics; Robotics; Sensing and Perception; Sustainability; User Interface; Visual Computing.

d. eTwinning - the community of schools in Europe. eTwinning is a project launched in January 2005 with the obvious purpose of facilitating partnerships between schools in Europe, of facilitating communication and cooperation between schools in the member countries of the European Union, involving teachers and pupils in new learning activities: development of various educational products that involve the use of new

technologies and for the development of which they work with teams from other countries [Vlada et al, 2009].

e. Semantic Digital Libraries: Exploiting Web2.0 and Semantic Services in Cultural Heritage* a service-oriented architecture that explicitly includes a semantic layer which provides primitive services to the applications built on top of the digital library. The PIRATES framework [Baruzzo et al, 2009, 23-29] assists end users to complete several tasks concerning the retrieval of the most relevant content with respect to a description of their information needs (a search query, a user profile, etc.).

At the end of this review on the potential of information technologies used for educational purposes, we will take the opportunity to add some information technologies that exist, which will certainly influence educational technology on the medium and long run and which cannot be conceived nowadays without the support of digital technologies.

The first technology is the future computer that will take the form of a pen or small tool with desktop and in education requires a quiet ubiquity in the economy and the training activities of learning (figure no. 3).

Figure no. 3 The future computer

A long-awaited technology is the iHolograms, which, combined with future technologies such as interfaces, the virtual world, the recognition of objects and smart technologies, will change the entire idea of education in the next 10-15 years. The figure below illustrates some of these technologies.

Figure no. 4 Some technologies for interactive interface

Figure no. 5 Some technologies for iHologram

5. CONCLUSION

We have concluded unanimously that everyday life all around us in cyberspace is technology and that it becomes constantly invisible and increasingly omnipresent.

In respect of these, the principal conclusion of study is that all these technologies will meet the characteristics of calm technology and we anticipate a positive contribution to the improvement of the educational technologies.

References

[1] Naisbitt, J., *Megatendinţe. Zece noi direcţii care ne transformă viaţa*, Editura Politică, Bucureşti, 1989
[2] Drăgănescu, M., *De la societatea informaţională la societatea cunoaşterii*, Editura Tehnică, Bucureşti, 2003
[3] Cornish, E., *Futuring. The Exploration of the Future*, World Future Society, Maryland, 2004
[4] Ţugui, A., Calm Technologies in a Multimedia World, *Ubiquity*, Volume 5, Issue 4, March 2004, 2-6

[5] Caracciolo, C., *Towards Modular Access to Electronic Handbooks*, Journal of Digital Infor-
     mation, Vol. 3, no. 4, 2003 at https://journals.tdl.org/jodi/article/viewArticle/86/84, accessed on
     January 11, 2010

[6] Harmsze, F., *A Modular Structure for Scientific Articles in an Electronic Environment*, PhD the-
     sis, Universiteit van Amsterdam, 2004

[7] Vlada, M., Jugureanu, R., Istrate, O., *E-Learning and Educational Software. Educational Pro-
     jects and Experience of Implementation in Romania*, Proceedings of ICVL 2009, Iasi, at
     http://www.icvl.eu/2009/disc/icvl/documente/pdf/met/ICVL_ModelsAndMethodologies_paper0
     1.pdf, accessed on February 14, 2010

[8] Baruzzo, A., Casoto, P., Challapalli, P., Dattolo, N., Pudota, A., Tasso, C., Semantic Digital Li-
     braries: Exploiting Web2.0 and Semantic Services in Cultural Heritage, *Journal of Digital
     Information*, Vol 10, No 6, 2009, 23-29