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The Internet and new educational perspectives

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Abstract

In today's society people are immersed in a large amount of data, in which there is the risk of getting lost. Information can be a problem, unless we know how to handle, control, monitor and verify its reliability. Data become useful information only when they quickly and effectively respond to a need. We have witnessed with telematics to the progressive transformation of the user into protagonist of her/his own formation. For educational systems new tasks have emerged, as well as the appearance of new tools, needed to deal with the new knowledge. The amount of scientific/didactic quality information available on the net constantly increases, for free and common use.

Key words: Internet, knowledge, education, telematics, educational technology, science, culture.

Introduction

In recent decades the knowledge scenario has radically transformed; we have witnessed to a change of communication and knowledge conditions and of the forms of human knowledge. Computer is an apparatus of knowledge, with characteristics of fluidity and interactivity; new media represent a privileged window on the world and are rising in importance for understanding culture (Castells, 2004).

In addition to teaching offered with the traditional lecture (explanation/query) and written texts, we have today new media (Internet, computers, interactive television, etc...), centered on the logic of participation, immersion and complicity. Currently we learn much more information with "multi-media" than "mono-media", and this information touches specialized high quality aspects of new media.

They attract increasingly more people, keeping them involved with more extensive bodily and mental areas than those by reading:

a) for improved sound;

b) for the quality of images;

c) because people are in a relation of complicity with the equipment.

The media system is therefore fun, closer to people, more engaging. The multimedia learning works as an "immersion" with the use of multiple senses, unlike the mono-media learning, which primarily operates through the sight (printed/writing).

Multimedia are realized within the user space of a multimedia computer, which contains the three basic elements of communication and knowledge, i.e. "audio-visual", "writing" and "interactivity", subtracting the book primacy as monopoly of the knowledge transmission.

The development of new technologies influences and changes many human cognitive functions; the change of conditions of communication modifies the forms of human knowledge, from memory to imagination, up to new forms of reasoning.

Schools, recreation centers and children services, as well as teachers, educators and parents are required to accompany this change:

a) modernising the apparatus of technical resources for teaching;
b) giving to everyone the chance to "literate" in the new era;
c) accepting styles of thought and action which are peculiar to the new field.

Children enjoy multimedia because they use the technology as a way to play; through recreational activities they approach the latest technology. They play with multimedia thanks to the complicity and the pleasantness of instruments, and recover the analogy and the comparison, linking everything in relationship to everything (Di Sia, 2016).

The media environment is rich in visual and sound stimuli (sound, images, animations, movement) and children participate and interact with this dynamic and different environment (Livingstone, 2004).

About the origin of "Educational Technology"

It is possible to trace the birth of "Educational Technology" to Skinner's studies of 1954 about the use of machines in learning processes; these technologies relate to methods of teaching and transmission of knowledge that use new communication tools. They concern hardware and software used in teaching and learning, field that concerns and affects all branches of knowledge, in order to optimize learning, critical and systematic ways of thinking about education.

The introduction of information and communication technologies not only solves the use of tools, but it involves an approach to educational paths, learning that moves in a multi-directional field of information (Bjornavold, 2001).

From the viewpoint of the development of tools science, we can identify three phases:

a) a first phase in which the research focused on the audiovisual and relative didactic material. Studies considered the machine, its features and the produced effects on educational process;
b) a second phase in which the study has been extended to the man-machine communication process;
c) a third phase, related to the creation of real educational systems.

This research line is also devoted to the development of methodological proposals related to the production of programmed instruction courses, searching for

adapted tools managing the subject presentation and reinforcing techniques that allowed learning.

Around 1970 the education programming appeared through a vision of education technology. This new way of understanding educational technology has allowed its growth for the multidisciplinary approach (Spendlove, 2005).

Telematics and educational systems

One of the developments of new technologies, interesting for teaching and education, is linked to the spread and utilization of "networks"; it represents the detachment of information from traditional media, the development related to the use of information technology in telecommunications, i.e. "telematics".

Telematics is currently seen as one of the technology areas that mostly involves teaching and learning processes. Since 1980, in combination with the spread of personal computers, the phenomenon of computers networks have seen a great development, gradually recognizing the importance of "being local or geographic networked", for sharing resources, for communication and collaboration (Manzelli, 2002).

The first examples of teleconferencing systems were born in the United States:

- IRC History - Electronic Information Exchange System (EIES), developed at the New Jersey Institute of Technology (*IRC History - Electronic Information Exchange System* (EIES), n.d.);
- CoSy, developed by the University of Guelf (Meeks, 1985).

Universities began to put attention in potential developments of such systems for teaching. An example is the spread of the so-called "Open Universities", that gradually entrusted to telematics resources the task of spreading and realizing their courses, leaving the old systems based on traditional technologies. Telematics facilitates the interaction among actors and resources, overcoming time and space barriers.

Communication can occur through chatting or conferencing, personal intercom in real-time or by e-mail or BBS (Bulletin Board System) in deferred mode.

Functionalities that telematics offers are multiple:

a) to allow the possibility to access information and network resources, enabling the access to databases;
b) to support the interpersonal exchange, enabling a collaborative approach in the building of knowledge, facilitating the exchange of viewpoints and experiences among colleagues and the sharing of educational packages;
c) to encourage the "work together" with others and to compare opinions;
d) to underline a social value: by the ability to bring and share opinions, the respect for diversity and tolerance arises.

From a more technical point of view, the development of Internet/Intranet has been the main driver for the growth of the telematic sector. Internet led to a massive growth of new users, with the need of new technical developments in terms

of transmission speed and evolution of browsers, with the evolution of HTML pages from static to dynamic.

The educational use of Internet is based on the possibility of:

a) computer and telecommunication literacy;

b) support to traditional education;

c) research;

d) game;

e) languages learning (Khannanov, Polat, Martinez de Morentin, Ferreras Orbegozo, & Moisseeva, 2003).

Telematics enables a relocation of information sources and provides a bi-directional inter-relationship among messages, erasing time and space bonds of communication. In such context the school can realize partnerships with universities and industries at national and international level, and thus it becomes an open system able to produce and actively disseminate cultural and scientific innovation.

In this context of "interactive communication system", the "teacher function" changes in relation to teaching materials and redefining the role of the teacher; she/he might include in the duties the innovative function of education and production of teaching materials.

The use of digital technologies, from the viewpoint of educational processes, promotes new ways of thinking organization and new forms of interpersonal communication and collaboration. Technology becomes a key resource for a school that has the responsibility of bringing out the knowledge society.

Science examples for education

Internet can be considered a way through which children enter the computing world. Surfing the net, children learn to interact with the mouse and to use hypertexts. Sending e-mails, they learn to type on computer and to use the keyboard; printing the information of interest, they learn to use services available on computer, and so on.

There are search engines designed for children, easy to use and with sections dedicated to them, which allow to perform in a practical and fast way Internet searches, and offer a range of services, such as newsgroups, links to entertainment, sports, video games, music, cinema, mini Internet courses, building a website.

It is possible to learn more about Nature and animals by visiting sites (naturalia.org, 2016) through which they know national and international parks and take a virtual trip in the zoo.

Internet can help children:

- to find educational resources, copies of documents, important pictures, collections of information on various topics;
- to make their homework through online encyclopedias, dictionaries, reference materials (*Liber Liber*, n.d.), historical-educational-cultural guides, to find and download educational materials about every discipline (science,

physics, chemistry, mathematics, geography, languages, economics, computer science, art, literature, etc.) (Di Sia, 2017);
- to "ask to the expert" on sites where a team of experts answers to scientific curiosities;
- "archaeo-astronomy", with the astronomical knowledge of ancient people.

It is possible to characterize the available tools, in order to define educational itineraries in relation to cognitive and educational goals. By the analysis of sites it is possible to obtain a classification of "applets", so oriented:

a) *views of phenomena for introductory purpose and/or presentation*: the level of interactivity is not high and there are usually no prerequisites. In these simulations you may generally vary one or two parameters and perform simple qualitative verification of phenomena and laws;
b) *activities and investigations with measurements, graphs and models*: in these learning sessions some theoretical mathematical premises are required for exercises with a higher level of interactivity;
c) *study of phenomena through games with simulations in different contexts*: the networking activity allows the deepening of topics also by visiting virtual museums, historical sites or searching for other educational materials, available "freeware" or "shareware".

In Europe one of the better equipped technological museums, even in terms of explorable online multimedia applications, is the Deutsches Museum in Munich (Germany) (*Deutsches Museum,* n.d.).

From the portal of "American Institute of Physics" (AIP) you may access to many sites of great historical interest, with "exhibits" and links relating the most important discoveries and inventions of the last century and the possibility of recognition to archives and documents (*American Institute of Physics*, n.d.).

There are links dedicated to the discovery of "natural radioactivity", starting from the dawn and coming to the advent of modern nuclear age. Considerable space is devoted to the figure of physicist Albert Einstein with his theory of special and general relativity that opened new frontiers and perspectives in the investigation of the physical world. There are many biographies of scientists who participated in the construction of new quantum physics.

In the twentieth century the interplay between science, history and politics becomes increasingly dense of consequences, with the birth and development of the "Manhattan project", connected to the creation of the first atomic bomb, with biographies of leaders like Oppenheimer. Even the biography of Sakharov, founder of the Russian school of nuclear physics, introduces the theme of the relationship between science and politics, seen as part of the struggle for civil rights in the former Soviet Union.

From the site of the "American Physical Society" (APS) it is possible to scroll the major inventions and discoveries of the past 100 years of physics (from 1900 to 2000).

For teachers there are good practice guides, computer resources and teaching scope tools.

Conclusions

For bringing out the "knowledge society", educational systems must promote the development of skills that are necessary to deal with the new knowledge, to establish links and synergies between learnings pursued within the school system.

The way is to go beyond the idea of the technology use as a simple vehicle of modernization, but thinking to it as something that deeply changes the learning process.

The mind is conceived as an entity no longer confined within the physical boundaries of the brain, but open to interactive information systems, extending the relation and integration capacities beyond the transmission in network and reaching an evolution of the human brain functions.

The networks application to the educational system can generate the development of a highly innovative system of "information/training", not simply conceived as a useful tool for increasing the amount of knowledge, but rather as a system in which everyone can acquire, with a large degree of autonomy, competence for initiating processes of exploitation of own creative personality.

The interactive communication system on the Internet, with the expansion of global communication in education, may allow the growth of mental integration processes.

Education and training have also the task of promoting the development of new type skills. New knowledge is constantly generated; people and organizations need new knowledge for dealing with problems and give new answers to old problems.

Research has shown that the obtained knowledge is the main factor influencing the creation of new knowledge (Harris, & Chrispeels, 2006); the more we know and the more we will have the opportunity to be creative and to create new knowledge.

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