The Role of the New Technologies in the Italian Primary School: Historical and Educational Outlines

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Abstract

Education is a process which helps the growth of the students. Thanks to it students can grow, develop and become adult and qualified persons in different fields of the humans' activity. Hence, the school educates only when it supports the students in getting and developing their own skills and when it helps them to get new attitudes towards themselves as well as the human, natural and artificial world. In this perspective, the school cannot continue to be a mere teaching-learning environment, just making frontal lessons, even if with the support of advanced multimedia technologies, but it should, indeed, focus the attention on the learning processes. This is the deepest change that the school needs. The possibilities offered by the computers in the educational field are many, especially as support in special didactics. In this sense, the access to multimedia and telematics has caused the activation of an autonomous process to build knowledge. The interpersonal exchanges mediated by the computer can break the isolation of a disabled person. The introduction of multimedia in school can then enhance both the teacher and the student to help the cooperative dimension of the teaching / learning process. The school has to open itself to new technologies and help the students to select the necessary information for the construction of the knowledge. Hence, it is of paramount importance to highlight the need for an adequate teaching-learning planning, so that the use of computers won't be extempore but it will be a suitable support for the learning process, selecting methods, tools, materials and time together with intervention strategies. The use of technologies in the elementary school represents a teaching resource, but it requires the compliance with specific conditions and the use of procedures which can match with the ministry guidelines and the all the problems related to the delicate phases of growth and development of the children.

I. Introduction

The great technological and scientific changes, the complex demands of our modern

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society, the importance of human and children rights acclaimed by the current paideutic view and the relation between the computerized culture and the educational processes, all gave origin to a polysemous concept of education that has ceased to be definitive acquisition of values but has become science in progress, at the service of the society, attempting to translate its needs, trends and values.

This approach has had a deep impact on the role of the school itself, which today is called to match the need to transfer a well-established culture with the need to prepare the future of mankind.

The introduction of the Programs of 1985, the Regulations introduced by the Law no. 148 of 1990, the Reform of Education introduced by the Law no. 53 of 28 March 2003, the National Guidelines for the curriculum introduced by Legislative Decree no. 59 of 19 February 2004 , before and after the Ministerial Decree 31 July 2007 and the last ministerial regulations have all completely revolutionized the view of the school with the aim to pursue a highly qualitative, functional, pluralistic and multi-structured educational model.

Hence, nowadays the primary school has become a teaching-learning environment that starts the process of the first educational literacy with the aim to provide the students with the tools that can help them to develop the effective even if not final knowledge.

Consequently, a school operating in the so-called Technotronic Age should alphabetize the students, enabling them to master the languages of the new technologies and providing them with the ability to combine structures, paths, content and methods.

Consequently, it is important to increase the students' ability to manage changes, exercising, according to Postman, (VV.AA., 1995), a thermostatic activity, that is the ability to attain a continuity and deal with the changes with the intent to improve the social life.

In fact, if a computerized literacy is a prerequisite to live in a computerized society, the school shouldn't be indifferent to the current changes and innovations. It should help the students to understand the nowadays reality, which is characterized by iconic, electronic and TV messages. It should help them to understand these messages in order to acquire a new knowledge.

Education is a process which helps the growth of the students. Thanks to it students can grow, develop and become adult and qualified persons in different fields of the humans activity. Hence, the school educates only when it supports the students in getting and developing their own skills and when it helps them to get new attitudes towards themselves as well as the human, natural and artificial world.

2. Historical and Educational Outlines

Richmond, in his book The Teaching Revolution, had already indicated the computer assisted instruction as the experimental instrument to discover new dimensions in education. (Richmond, 1975)

It is important to emphasize that computers help children to acquire new forms of knowledge that would otherwise be incomprehensible and abstract to them.

It is indeed *"a new rationality that can strengthen the learning process that occurs through the construction of logical models of the reality"*. The computer, as a tool of knowledge, stimulates thinking; it helps you to think about and, according to Papert, it helps you to learn how to learn. (Papert, 1984)

Anyway, the computer and other technologies used in the educational field cannot in any way replace the teacher. The human being, indeed, in a highly technological situation, should not run the risk of losing his/her human side.

"Technology may still be considered as a tool but we should retain a metatemporal and metaspatial dimension." It is clear the need to constantly pay attention to the power of the human mind, to its resources and to how to take advantage of them to save man from the continuous technological progress.

Indeed, the Programs for the elementary school of 1985 read: *"Even the computer science requires a careful remark: on the one hand it highlights the idea of algorithm, on the other it shows the computer as a tool to explore the world of numbers, processing and interaction."*

The Ministry Programs showed the possibility to develop training routes that would introduce the initial but also consistent and productive use of computational and data processing devices. In this way the proposal to give more importance to technology would be more effective and the computer would be used as an essential instrument.

The Law 53/2003 clearly recalls a constant and profitable use of technology. In the text of the Reform, you read that *"to carry out the purposes of this Law, the Minister of Education, University and Research supports the development of multimedia technologies and the technology literacy, in the full respect for the pluralism principle of the computer solutions provided by technology, to encourage and develop the creative and collaborative skills of the students".*

The Article no. I of this Law underlines the importance of the role of new technologies in the process of knowledge; *"since the school is the place where you learn to communicate in an in-depth way, it is inevitable to include ICT (Information and Communications Technology) in the sphere of its interests since kindergarten, so starting processes of gradual and progressive literacy which then become more and more aware and sophisticated."*

The National Guidelines for the Curriculum introduced by the Legislative Decree no. 59 of 19 February 2004 provide for the introduction of the ICT teaching in the first year of primary school and give a new and clear importance to the new technologies in the educational and training field.

In the Act of 8 September, 2009, the Italian Ministry of Education sets out the general criteria necessary to harmonize the educational, teaching and the organizational structures with the objectives of the regulation issued by the Presidential Decree no. 89 of 20 March, 2009 for the kindergarten and the primary school. This ministerial document highlights the attempt to harmonize what is expressed by the Legislative Decree no. 59 of 19 February 2004 and required by the Ministerial Decree of 31 July 2007.

It reads "... *The school works in a changing society. The challenges of the digital revolution, globalization and of the coexistence of different cultures and religions can be transformed into opportunities, thanks to the action of the school….* "and "…*Recently it has become evident the so-called "Digital Disconnect" between the school and the society. What apparently appears as a conflict must, however, represent a great opportunity for the school. It is so necessary to introduce new languages in the educational practice and make use of digital contents.*"

Therefore there should be a special care for the planning of the activities and the staging of technological equipment. In fact it is clear that increasingly modern, rich and structured equipment should be addressed to the powerful support that the new technologies (from PCs to the network browser, from the latest computer programs to digital books, from scanners to interactive whiteboards and new e-learning opportunities) can provide the teaching ".

In this perspective, the school cannot continue to be a mere teaching-learning environment, just making frontal lessons, even if with the support of advanced multimedia technologies, but it should, indeed, focus the attention on the learning processes. This is the deepest change that the school needs.

The possibilities offered by the computers in the educational field are many, especially as support in special didactics. In this sense, the access to multimedia and telematics has caused the activation of an autonomous process to build knowledge. The interpersonal exchanges mediated by the computer can break the isolation of a disabled person.

The use of technology can help the process of self-knowledge.

Therefore the use of the computer at school becomes absolutely necessary to provide a learning path that is individualized, personalized and respectful of the limits of a subject, who can become an actor and not a mere spectator of his/her learning process supported by the computer.

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The computer, in fact, facilitates the learning process and creates a learning environment in which pupils, every time they make mistakes, have the opportunity to try and try again.

Furthermore, the new technologies can improve the quality of the work performed.

In particular, it should be pointed out that the lack of motor coordination skills or other disabilities often tend to slow the capacity of production, especially the creative skills of a disabled person.

The inability of the subjects to perform some tasks, for any motor limitation, arises in the subject insecurities and anxieties that negatively affect his/her self-esteem.

Hypertext, hypermedia, and telematics offer many advantages, especially when they allow to browse the wide range of data of a computer system, thanks to a kind of information that recalls the mental processes.

The multimedia system offers the student a greater complicity and involvement, the space is unlimited and the same mental borders become more flexible and dynamic.

With the shift from the text to the hypertext, the school opens itself to multimedia and chooses a more alive and a more exciting culture for the users.

Piaget stated: "Intelligence is the System of Living and Acting Operations... The operation is nothing but action: real action, but internalized and reversible. To make the child combine operations, whether numeric operations or space operations, he must have manipulated, he must have acted, experienced not only on drawings but on a real world, on physical objects (Piaget, 1956).

Bruner wrote: *"At first the child's world is known to him principally by the habitual actions he uses for coping it. In time there is added a technique of representation through imagery that is relatively free of action. Gradually there is added a new and powerful method of translating action and image into language, providing still a third system of representation…..".* He also wrote that the knowledge of a person is not only located in his mind, in a "solo" form, but also in the notes that he takes and consults, in the passages he highlights in the books that are on his shelves, in the manuals that he has learned to consult, in the information he has loaded into his computer, in his friends who can be traced for a reference or to ask a question, and so on almost indefinitely (Bruner, 1967) .

These statements already refer to the possibilities that the virtual reality offers the students to operate, not only on a concrete level, but also on an iconic and symbolic level.

In fact, the virtual dimension has most of the features of the real one, including the perception of the shape, the three-dimensional dimension and the manipulability. The virtual objects, even if they appear in a three-dimensional shape, can however be moved, rotated and folded; compared to the concrete objects, they have a greater

flexibility, because the virtual objects can be enlarged or reduced, as well as moved and rotated.

On a psychological level there is a clear synchrony between the increase of the media in multimedia communication and that of the mind when generating ideas, which are created in a simultaneously visual, linguistic and dynamic way. Perhaps this is the reason for, according to the new theories about the teaching-learning process developed in the last decade, technology has produced new communication tools which are absolutely unique and which are getting closer and closer to the spontaneous human thought.

In this perspective, Wittgenstein's metaphor of "criss-crossed landscape" underlines the possibility to arrange multiple representations of reality that need to be open, nonlinear. It requires to go throughout these landscapes many different times but from different directions, to ensure the mastery of the contents (Lodrini 2002).

It comes out a need to create learning environments that include and emphasize the complex, rational and emotional network structures that characterize the cognitive processes. These processes, thanks to the interactivity allowed by these tools, get an explicit shape and become more easily observable, recordable, and analyzable.

Thanks to the virtual reality "Learners can control their own learning, learn from the others, and develop meta-cognitive skills, such as to reflect on their actions." (Jonassen 1994).

Hence fostering learning and knowledge through the use of virtual learning environments means fostering an *"anchored and generative learning, the cognitive flexibility, the transfer and the intentional learning."*

The Virtual Learning Environments are a resource in supporting teaching and learning strategies, without replacing the concrete learning environments (De Bartolomeis, 1978). They constitute an appropriate integration of it because they refer to specific activities (Piaget) and aim at the maturation of specific operational skills at a symbolic level; but, most of all, they come from concrete problem situations (Dorner, 1988) mainly related to the children life.

In this context, the simulation games, typical of AVA, are particular important (Ceriani, 1996), since they are experiential contexts that allow students to find / rediscover / reinvent / reconstruct concepts, ideas and theories, preferably according to the problem solving and the cooperative learning methodologies. (Sibilio, 2011)

3. Conclusion

The introduction of multimedia in school can then enhance both the teacher and the student to help the cooperative dimension of the teaching / learning process. The

school has to open itself to new technologies and help the students to select the necessary information for the construction of the knowledge.

Hence, it is of paramount importance to highlight the need for an adequate teaching-learning planning, so that the use of computers won't be extempore but it will be a suitable support for the learning process, selecting methods, tools, materials and time together with intervention strategies.

The use of technologies in the elementary school represents a teaching resource, but it requires the compliance with specific conditions and the use of procedures which can match with the ministry guidelines and the all the problems related to the delicate phases of growth and development of the children.

Therefore, it is necessary to require an *"approach that considers technology a resource, able to bring out new forms of critical considerations. There is a strong educational value of new technology every time they induce in some way to reflect on the underlying rules and on internal criteria. The achievement of higher levels of thinking (that is the ability to consider problems in a plurality of views, to consider them in unusual perspectives; it is the awareness of deeper and hidden relationships), represents one of the most important contributions that technology will be able to provide 'learning."*

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