

The Implementation of Practices with ICT as a New Teaching–Learning Paradigm

Antonio Cartelli

University of Cassino, Italy

INTRODUCTION

Information and communication technology (ICT) is today influencing many aspects of our lives from administration to economy from culture and entertainment to work, and so forth. Education is receiving from IT and ICT a great deal of suggestions just from their first beginning. It is well known, for example, that Taylor (1980) outlined three metaphors for computer use in education: tutor, tool, and tutee: first, tutor (by looking at the possible use of computer to support or to substitute teachers); second, tool (by using suitable editing tools to support students' autonomous learning); and last, tutee (by adopting special programming languages for the development of metacognitive skills in students' minds). The reader will easily recognize in the above metaphors many ideas belonging respectively to the behaviorist, the cognitivist, and the constructivist psycho-pedagogical paradigms.

Very soon, not only computing but all new technologies and especially the ICT entered in teaching–learning processes for the following reasons: to enhance students' results, to help students in overcoming their learning difficulties, to build more effective strategies for lifelong learning, and so on. Taylor's point of view, for example, has been recently integrated by Galliani, Costa, Amplatz, and Varisco (1999) to include the experiences involving CAI (computer assisted instruction) and CAL (computer assisted learning) tools, or to adopt the artificial intelligence viewpoint in the support to education with the development of ICAI (intelligent computer assisted instruction) and ITS (intelligent tutoring systems) systems.

With the Internet, the social effects induced from the Net on human activities entered in education and new instruments and processes for educational phenomena were proposed from scholars and scientists; the more relevant for what follows are virtual communities (Rheingold, 1994), which lead to the proposal of virtual communities of students and to e-learning; the definition of joint or collective intelligence (Lévy, 1996); the

definition of connective intelligence (de Kerckhove, 1995); and the social negotiation extensions and the hypertextual and multimedial aspects of knowledge (Calvani & Rotta, 1999).

Most of the experiences involving the use of the ICT are concerned with the change in the instruments adopted in the carrying out of teaching-learning processes and in their organization; it has to be noted on another hand that ICT introduces new ways of thinking at teaching-learning phenomena. The most relevant examples on this side are augmented reality experiences and simulation with the use of virtual reality which are better described below.

Augmented reality is based on the use of a technology system that enhances one's perceptions and experiences by superimposing a layer of virtual reality over real world environments. The overlay of virtual reality provides more information on the real world and helps subjects in having a deeper and better view of phenomena. The augmented reality experiences enable contextual learning which can be applied to one's job or study.

Simulation in virtual environments let people access new environments and experiment sensations and emotions not less real than the ones they have in reality. The flight simulator, by which an airplane can be driven from everyone without any problem, is perhaps the system better representing the features of this educational method and its potentialities. In what follows, another example for the use of ICT in education is discussed and the experiences the author made with it are analyzed.

BACKGROUND

The hypothesis for the existence of a new teaching method has been deduced from the results of the experiences the author recently made in two different contexts: (a) the innovation in Latin paleography teaching during the last decade, and (b) the coordination

of a master course for in-service teachers (or people temporarily in this job), where the ICT and the reform of the school system were used to plan teaching activities. In the first case, some dynamic Web sites for the management of bibliographical information were introduced in paleographic teaching and research, and students were authorized to access them and to work together with librarians, archivists, paleographers, and so forth. The observation of the students' behaviors and the scores they had at the ending examinations resulted in the following deductions:

1. The suitable use of online information systems (i.e., special Web sites) had a great part in the creation of constructivist learning environments and in helping the students to develop cognitive apprenticeship strategies (i.e., the systems helped students in improving learning and performances).
2. The careful analysis of the groups of students led to the detection of the features of communities of learners for those groups; in other words, Web technologies integrated traditional learning strategies and contributed in the creation of communities of learners where they were never observed before.
3. At last, the same results from Scardamalia and Bereiter (1996) on the impact of virtual environments and simulations on students' features and skills and the ones from Lave and Wenger (1991) on legitimate peripheral participation were observed.

As regards the communities working around the information systems, it has to be remarked that every group (i.e., the students, the scholars, and the researchers working on every project) had all the features of a community of practice (Wenger, 1998, 2004). In the case of the master course "Teacher and Tutor in the Renewed School," which is the more complex and articulated answer of the pedagogical community in the university of Cassino, Italy, to the schools' requests for in-service training courses for teachers, two information systems were used for the management of the courses:

- The first one was an e-learning platform for the management of the materials and of the discussions among students, tutors, and lecturers; otherwise stated, it was used as a content management system (CSM) and a computer supported collaborative learning system (CSCLS).
- The second one, called TETIS (Teaching Transparency Information System), implemented the practices of every day teaching as required from the reform laws and supported people attending the course in the simulation of everyday teaching experiences.

At the end of the course, a survey has been proposed to the 54 people (nearly 50% of the persons attending the course) who chose to intensively use TETIS platform for simulating everyday schoolwork. In Table 1, their synthetic answers with respect to the perception of the support that TETIS can give to teaching work is reported.

Table 1.

Support given to teaching work from TETIS	Abs. values		Percentage	
	Yes	No	Yes	No
Is the planning of the teaching work as supported from TETIS coherent and complete?	53	1	98,1	1,9
Is the work with the platform TETIS easy enough to manage?	51	3	94,4	5,6
Do the information in the platform completely describe teachers' work?	47	7	87,0	13,0
Do the information in the platform adequately describe students' behaviors and performances?	41	13	75,9	24,1
Do TETIS platform lead teachers to better programming their work and to obtain better results?	51	3	94,4	5,6
Do TETIS platform make easier for teachers the personalization of student's teaching-learning phenomena?	50	4	92,6	7,4

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