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CHAPTER 3

LITERATURE REVIEW

3.1 Impact of ICT on education

Currently, there are a significant number of initiatives to assess and monitor the efficiency of ICT use and its impact on education. SITES (the second information technology in educational study), sponsored by the International Association for the Evaluation of Educational Achievement (IEA), is an exemplary study which identifies and describes the educational use of ICT across 26 countries in the world. Cox and Marshall (2007) point out that ICT studies and indicators do not demonstrate solid effects. Machin et al. (2006) state that, while there is a clear case for using ICT to enhance the computer skills of students, the role of technology enhanced learning (TEL) is more controversial (see Yusuf, & Afolabi, 2010; Shaikh, 2009; Jayson, 2008; Shaheeda et al., 2007) it is argued that ICT helps to improve the quality of learning and educational outcomes.

3.2 ICT and students' achievement

Kulik's (1994) meta-analysis study revealed that, on average, students who used ICT-based instruction scored higher than students without computers. The students also Learned more in less time and liked their classes more when ICT-based instruction was included. The analysis of the effects of ICT methodological and technological innovations on the students' attitude towards the learning process and on students' performance seems to be evolving towards a consensus, according to which an appropriate use of digital technologies in higher education can have significant positive effects both on students' attitude and their achievement.

Li et al. (2003) pointed out: 1) Web-based instruction presents information in a non-linear style, allowing students to explore new information via browsing and cross-referencing activities. 2) Web-based teaching supports active learning processes emphasized by constructivist theory. 3) Web-based education is enhanced understanding through improved visualization and finally, the convenience; it could be used any time, at any place.

3.3 Teachers' attitudes towards ICT in education

Recent studies show that, the successful implementation of the educational technologies depends largely on the attitudes of the educators. Especially, Israel (Klieger, Ben-Hur, & Bar-Yossef, 2010), Australia (Pierce & Ball, 2009), USA (Glazer et al., 2009; Hixon & Buckenmeyer, 2009; Liu & Szabo, 2009), Turkey (Goktas, Yildirim, & Yildirim, 2008) and Asia/Far East (Sang, Valcke, Braak, & Tondeur, 2010) based studies still consider the attitude of teachers towards ICT as an important issue. Numerous researchers (Atkins & Vasu, 2000; Gbomita, 1997; Moore & Benbasat, 1991; Roblyer & Knezek, 2003; Sugar, Crawley, & Fine, 2004) point out that, a teacher's attitude or belief is one of the several important human factors which has a significant impact on the computer adoption and the implementation of the technology in classroom. Bullock (2004) found that, the attitude of teachers is a major enabling/disabling factor in the adoption of the technology. Similarly, Kersaint et al. (2003) found that, the teachers with positive attitudes towards the technology feel more comfortable while using it and them usually incorporate it into their teaching activities. Therefore, the teachers' attitudes towards computers are one of the significant factors in enhancing the quality of computer usage for instruction (Yuen, Law, & Chan, 1999). Some researches (Bayramoğlu, 2007; Yildirim, 2000) point out that, the teachers' negative attitudes towards computers changed after training about computer use. Regarding this subject Yildirim (2000), pointed out that after completing the training, the teachers' anxiety towards the computers decreased significantly while their confidence and affiliation to computers increased prominently. Bayramoğlu (2007) claimed that the training created positive and significant differences on the attitude towards worldwide web of teachers participating this program. Moreover, there were also significant differences on their web self-efficacy and perceived web usefulness scores after the training. In conclusion, there is a positive relationship between the teachers' attitudes towards ICT and PD. When the teachers perceive ICT as a beneficial, compatible instrument with their current activities, they will demonstrate positive attitudes towards ICT in education.

3.4 ICT and teacher's professional development

Effective ICT use in education increases teachers' training and professional development needs. For that adequate time must be allowed for teachers to develop new skills, explore their integration into their existing teaching practices and curriculum, and undertake necessary additional lesson planning, if ICTs are to be used effectively. However, ICTs can be important tools to help meet such increased needs, by helping to provide access to more and better educational content, aid in routine administrative tasks, provide models and simulations of effective teaching practices, and enable learner support networks, both in face to face and distance learning environments, and in real time or asynchronously.

The investment in the educational technologies gained an increasing trend all over the world, the use of these technological facilities in learning environments also gained importance so the teachers are supposed to perceive the use of technology as a natural part of their profession in order to be able to conjoin these investments for enhancing the learning of students. The book of Turkish Ministry of National Education (MoNE) for the standardization of teachers claims that the teachers have to integrate information and communication technologies with teaching and learning processes. Besides, the teachers should not only point out how they use ICT at their teaching and learning environments in their lesson plans, but also use these technologies to support the student centered strategies (MoNE, 2009c). However, integrating technology into teaching cannot be achieved overnight. Several researchers indicate that the teachers are supposed to overcome some stages (Mills & Tincher, 2003; Proctor, Watson, & Finger, 2004; Russell, O'Dwyer, Bebell, & Tao, 2007; Yang & Huang, 2008). At first stages, the teachers tend to use the technology almost not at all, however later on; they consider the technology as an instrument which necessities to be taught.

3.5 Factors that Prevent Teachers from Using Technology

As the use of technology increases, they tend to perceive it as an instrument to aid the instruction, rather than being a core educational topic (Hixon & Buckenmeyer, 2009). ICT training in the colleges is important. To achieve successful training we need to be aware of the user's attitudes toward computers (Zoltan & Chapanis 1982). On the other hand, Brown et al. (1978) suggest that exposure to computer related devices may be a factor in determining ones attitudes toward computers. A number of early studies investigated why

teachers do not use computers in their teaching (Rosen & Weil, 1995; Winnans & Brown, 1992; Dupagne & Krendl, 1992; Hadley & Sheingold, 1993). Not surprisingly they found a list of inhibitors:

- 1) Lack of teaching experience with ICT;
- 2) Lack of on-site support for teachers using technology;
- 3) Lack of ICT specialist teachers to teach students computer skills;
- 4) Lack of computer availability;
- 5) Lack of time required to successfully integrate technology into the curriculum;
- 6) Lack of financial support.
- 7) lack of confidence of teachers in using ICT;
- 8) lack of detailed planned into how ICT can be used to enhance the teaching and learning;
- 9) Technical problems and shortage of computers in classrooms;

Robertson et al (1996) argued that teachers' resistance to computer use was divided into several broad-based themes:

- 1) Resistance to organizational change;
- 2) Resistance to outside intervention,
- 3) Time management problems;
- 4) Lack of support from the administration;
- 5) Teachers' perceptions;
- 6) Personal and psychological factors.

3.6 ICT training for teacher

Teaching is becoming one of the most challenging professions in our society where knowledge is expanding rapidly and much of it is available to students as well as teachers at the same time (Perraton, Robinson, & Creed, 2001). Today, a variety of ICT can facilitate not only delivery of instruction, but also learning process itself. Moreover, ICT can promote international collaboration and networking in education and professional development. There's a range of ICT options – from videoconferencing through multimedia delivery to web sites - which can be used to meet the challenges teachers face today. In

fact, there has been increasing evidence that ICT may be able to provide more flexible and effective ways for lifelong professional development for today's teachers.

While information and communication technology (ICT) is not a panacea for all educational problems, today's technologies are essential tools for teaching and learning. To use these tools effectively and efficiently, teachers need visions of the technologies' potential, opportunities to apply them, training and just-in-time support, and time to experiment. Only then can teachers be informed and confident in their use of new technologies (Bowes, 2003). Modern developments of innovative technologies have provided new possibilities to teaching professions, but at the same time have placed more demands on teachers to learn how to use these new technologies in their teaching (Robinson & Latchem, 2003). Research indicates that ICT can change the way teachers teach and that it is especially useful in supporting more student-centered approaches to instruction and in developing the higher order skills and promoting collaborative activities (Haddad, 2003). ICT teacher training can take many forms. Teachers can be trained to learn HOW to use ICT or teachers can be trained VIA ICT. ICT can be used as a core or a complementary means to the teacher training process (Collis & Jung, 2003). This paper organizes various ICT teacher training efforts found in different countries into four categories using the framework of Diagram 3.1

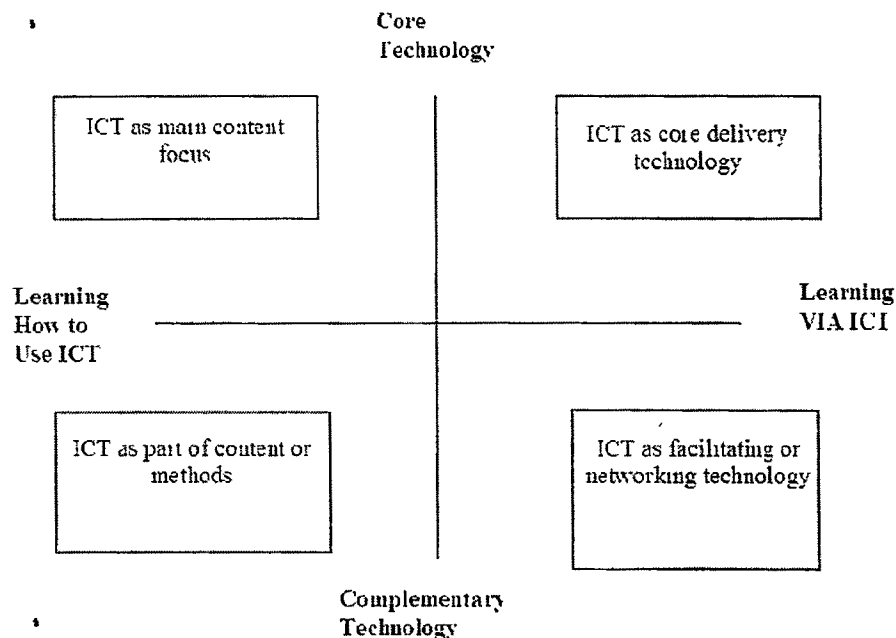


Diagram 3. 1: Teacher training categories (From Collis &Jung, 2003, p.176)

(<http://www.ncrel.org/cw/>) is a resource developed by the federally-funded (USA) North Central Technology in Education Consortium for K-12 teachers. Captured Wisdom (tm) CD-ROM Library is made up of stories about teachers who are making meaningful and creative uses of technology in their instruction. These CD-ROMs contain examples of real educators and learners using successful practices of technology to support instruction and learning in their classrooms.” In this specific case, teachers learn how to use ICT in their classrooms by actually being engaged in the process of ICT-integrated training. There are many examples of ICT, particularly Internet and Web-based communication technologies, being used to support teachers' on-going professional development and networking. The use of the Internet would enhance continuous professional development activities of teachers, connecting teachers to larger teaching communities and allowing for interaction with expert groups. Some specific examples are discussed below.

The UK Virtual Teacher Centre (<http://vtc.ngfl.gov.uk>) website provides a "Career Development" area which provides a variety of learning and teaching resources and links to support teachers' continuing professional development. Under "Support Providers", for example, teachers can find a range of resources for professional development, such as the ICT Support Network Directory which provides easy access to ICT provision and training. TeacherNet UK (<http://www.teachernetuk.org.uk>), an independent professional association for teachers, also supports teachers' professional development and national and international teacher networking. The US Teachers Network (<http://www.teachnet.org>) identifies and connects innovative teachers exemplifying professionalism and creativity within public school systems. This network promotes interactive collaboration among teachers and educators to improve teaching and student achievement, provides resources for designing their own professional development, disseminates the work of outstanding classroom teachers, and attempts to provide teachers with the knowledge and skills needed for good teachers. New Opportunities Fund (NOF), which is currently providing ICT training for teachers and librarians. "International Professional Development" helps teachers learn from and contribute to educational ideas and best practice throughout the world.

One of the best ways to develop teachers' ICT skills and promote ICT-pedagogy integration in their teaching is the provision of ICT-based training environments where on-demand access to materials, peers, and networks of experts where expertise and advices can be obtained and active discussion can take place in relation to technology or pedagogy. Use of ICT to support teachers' on-going professional development can be very effective as long as organized support is provided (Pacey, 1999). A well-designed teacher training program is essential to meet the demand of today's teachers who want to learn how to use ICT effectively for their teaching.