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Including ICT in Educational Set-Up…A Today's Need

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Abstract

The advent of the internet and the World Wide Web has pressured new productivity and in turn expectations on these endeavors for the growth and betterment of the society. Therefore, including ICT in today's educational scenario is the need of the day. This paper, while limited by the lack of available empirical data and constraints of desk research aims to present a case study of the current status of ICT in India with a focus on role of ICT in Teacher Education. The paper analyses ICT in various aspects like, its holistic vision, ICT as an object , as an assisting tool, benefits of teacher-training and essential ICT skills followed by the discussion of the benefits of including ICT in Educational system. This paper may prove useful for anyone wishing to undertake empirical research in this, until recently, neglected field or simply needing to gain an overview of the role of ICT in the present educational set-up in India.

***Key words*:** ICT, Teacher Education, ICT Skills.

ICT: A Holistic Vision

ICT is a generic term referring to technologies which are being used for collecting, storing, editing and passing on information in various forms (SER, 1997). A personal computer is the best known example of the use of ICT in education, but the term multimedia is also frequently used. Multimedia can be interpreted as a combination of data carriers, for example video, CD-ROM, floppy disc and Internet and software in which the possibility for an interactive approach is offered (Smeets, 1996). Many countries around the world have established organizations for the promotion of ICTs, because it is feared that unless less technologically advanced areas have a chance to catch up, the increasing technological advances in developed nations will only serve to exacerbate the already-existing economic gap between technological "have" and "have not" areas. Internationally, the United Nations actively promotes ICTs for Development (ICT4D) as a means of bridging the digital divide. ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries.

Much has been said and reported about the impact of technology especially computers in education (Jhurree, 2005). Initially computers were used to teach computer programming but the development of the microprocessor in the early 1970s saw the introduction of affordable microcomputers into schools at a rapid rate. Computers and applications of technology became more pervasive in society which led to a concern about the need for computing skills in everyday life. Hepp, Hinostroza, Laval and Rehbein (2004) claim in their paper "Technology in Schools: Education, ICT and the Knowledge Society" that ICTs have been utilized in education ever since their inception, but they have not always been massively present. Although at that time computers have not been fully integrated in the learning of traditional subject matter, the commonly accepted rhetoric that education systems would need to prepare citizens for lifelong learning in an information society boosted interest in ICTs (Pelgrum, W.J., Law, N., 2003).

Pelgrum and Law (2003) state that near the end of the 1980s, the term 'computers' was replaced by 'IT' (information technology) signifying a shift of focus from computing technology to the capacity to store and retrieve information. This was followed by the introduction of the term 'ICT' (information and communication technology) around 1992, when e-mail started to become available to the general

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public (Pelgrum, W.J., Law, N., 2003). According to a United Nations report (1999) ICTs cover Internet service provision, telecommunications equipment and services, information technology equipment and services, media and broadcasting, libraries and documentation centres, commercial information providers, network-based information services, the use of information and communication technologies in the educative process has been divided into two broad categories: ICTs for Education and ICTs in Education. ICTs for education refers to the development of information and communications technology specifically for teaching/learning purposes, while the ICTs in education involves the adoption of general components of information and communication technologies in the teaching learning process. According to UNESCO (2002) information and communication technology (ICT) may be regarded as the combination of 'Informatics technology' with other related technology, specifically communication technology. The various kinds of ICT products available and having relevance to education, such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counseling, interactive voice response system, audiocassettes and CD ROMs etc have been used in education for different purposes (Sharma, 2003; Sanyal, 2001; Bhattacharya and Sharma, 2007)..

Role of ICT in Teacher Education

Information and Communication Technologies (ICT) that are becoming increasingly pervasive in societies around the world are also reaching schools. With numerous global advancements in ICT it is essential that educators have a thorough working knowledge of these media and their influence on the performance and engagement of their students.

Information and Communication Technology (ICT) can open up amazing possibilities for early childhood learning, extending children's worlds and helping them to expand and explore their thinking. Or, it can be an expensive way to teach the same things in the same way as before. Ann Hatherly argues that it's not the hardware and software that matter, but how teachers use it.

It seems that effective development of pre-service teachers' ICT proficiency is not a straightforward process, but is the one that asks for a careful, multilayered approach (Zuochen and Dragana, 2008). First, a needs assessment is important to find out what ICT skills and knowledge teachers need at schools. Second, designers of teacher education programs should know the pre-service teachers' perceptions of ICT and their attitudes toward ICT integration into curriculum (Murphy, 2000). This is because these attitudes and perceptions are instrumental in how future teachers will use ICT in their teaching (Sasseville, 2004). Although there is a great deal of research on technology and teacher education, because of specifics of various teacher education programs, changes in population trends, and rapid technology advancements, there is a constant need for more research about the role of ICT in teacher education programs in this specific context. Third, teacher education programs need to take into account the two typical arguments in favour of the ICT appropriation in schools. One argument emphasises the importance of technological skills. Supporters of this argument urge teacher education programs to provide future teachers with as many technological skills as possible. The other argument accords a more important role to developing pre-service teachers' perspectives of and pedagogical knowledge about technology integration. Proponents of the latter argument believethat content-related technology knowledge is the most important factor for technology integration in teaching. This knowledge is referred to as technology pedagogical content knowledge (TPCK) (Mishra & Koehler, 2006). The institutions that uphold the teacher education programs need to be aware of these two competing arguments and use the opportunity to build a balanced ICT program for pre-service teachers.

According to Daniels (2002) ICTs have become within a very short time, one of the basic building blocks of modern society. Many countries now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing and numeracy. The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning, and research (Yusuf, 2005). A great deal of research has proven the benefits to the quality of education

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(Al-Ansari, 2006). ICTs have the potential to innovate, accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Davis and Tearle, 1999; Lemke and Coughlin, 1998; cited by Yusuf, 2005).

Several studies have shown that ICT can enhance teaching and learning outcomes. For example, in science and mathematics education, scholars have documented that the use of ICT can improve students' conceptual understanding, problem solving, and team working skills (Culp, Honey & Mandinach, 2005; Gerban, 1992; Tao & Gunstone, 1999; Toomey & Ketterer, 1995; Zhou, Brouwer, Nocente & Martin, 2005). As a result, most curriculum documents state the importance of ICT and encourage school teachers to use them. However, teachers need to be specifically trained in order to integrate ICT in their teaching (Batane, 2004; Jacobsen, Clifford & Friesen, 2002; Markauskaite, 2007; Mitchem, Wells & Wells, 2003; Yildirim, 2000).

Although schools are known to be resistant to innovation and change (Kearsley, 2004), the proliferation of ICT is beginning to affect how teachers teach (Reid, 2002). Since the curriculum documents provide arguments for introducing ICT in the school setting, schools expect that graduates from teacher education programs have a reasonable knowledge of how to use ICT (Montgomerie & Irvine, 2001).

Benefits of Teacher Training and Essential ICT Skills

In order to become a confident user of ICT in the classroom, teachers need to take part in ongoing training. Teachers should understand the benefits of digital literacy.Training in ICT needs to be recognized as essential for teaching such skills, and as an enabler of other teaching and learning practices.

As the Infodev.org report put it:

"Teachers require extensive, on-going exposure to ICTs to be able to evaluate and select the most appropriate resources. However, the development of appropriate pedagogical practices is seen as more important than technical mastery of ICTs."

'One-off training' is not sufficient, schools need to invest in and implement long term ongoing training and continuous professional development in order to keep up with rapidly evolving digital technologies.

Essential Digital Skills for 21st century teachers

The digital skills that teachers need have long moved on from just being able to use word processing and spreadsheets software. Digital skills that 21st Century teachers should have include cloud storage and sharing solutions, social media, web editing, image editing, presentation software, and general multimedia. The 'flipped classroom' model is being heralded by some as the future of 21st Century learning. Video plays a fundamental role in this.

Tim O'Reilly founder and CEO of technology publisher O'Reilly Media say that, video as a learning medium will play an ever increasing role in the classroom. "Videos are an inversion of the learning paradigm, from one in which the teacher lectures in class and then assigns homework to one where the student watches the lecture at home and then does what used to be homework in class, which makes so much more sense".

Classroom education is increasingly moving away from lecturing at students to a more collaborative project based model and digital technology plays a fundamental role in this. Despite the many benefits of using the Internet and other digital technologies there are also a number of dangers that pupils face. Cyber bullying, IT security and identity theft are all areas which teachers should have a good knowledge of in order to be able to help students deal with issues if they arise – and to encourage them to be responsible Web users.

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Having to use ICT in an innovative manner is an important bottleneck teachers have to cope with (Van den Dool, 1998). It can be interpreted as a 'design-question' and allows us to formulate the proposition that 'educational designing' skills form the core of the future teaching profession.

Generally, the following functions of the use of ICT in education are described in literature (SER, 1998, Moonen and Kommers, 1995, Pilot, 1998).

1. ICT as object. It refers to learning about ICT. Mostly organised in a specific course. What is being learned depends on the type of education and the level of the student's. Education prepares students for the use of ICT in education, future occupation and social life.
2. ICT as an 'assisting tool'. ICT is used as a tool, for example while making assignments, collecting data and documentation, communicating and conducting research. Typically, ICT is used independently from the subject matter.
3. ICT as a medium for teaching and learning. This refers tot ICT as a tool for teaching and learning itself, the medium through which teachers can teach and learners can learn. It appears in many different forms, such as drill and practice exercises, in simulations and educational networks.
4. ICT as a tool for organization and management in schools.

Benefits of Using ICT in Education

There are, however, potential benefits offered by current ICTs that are not so easily replicated through other means. It is for this reason they can no longer be regarded as a luxurynor can their incl usion in an early childhood programme be left to chance.Some benefits of including ICT in Education could be traced as:

1. Their propensity to work well in visual and increasingly oral modes makes them particularly well suited, some would say tailor-made for early childhood settings. Indeed, it is hard to imagine documented learning stories having the same impact without the easily constructed visuals facilitated by digital technologies. Within a curriculum that places high value on responsiveness, the speed with which technology allows us to create and share is ideal for meeting young children's desire for immediacy.
2. Another benefit for the inclusion of ICT is that it has t5he potential to encourage and support the kinds of activities associated with the new learning emphasis of the 21st century.
3. ICT gives everyone the power to create, access, use and share information so that individuals and communities can achieve their full potential.
4. Increasingly, ICT is being applied successfully in instruction, learning and assessment. ICT is considered a powerful tool for educational change and reform. A number of previous studies have shown that an appropriate use of ICT can raise educational quality and connect learning to real-life situations (Lowther, et al. 2008; Weert and Tatnall 2005). As Weert and Tatnall (2005) have pointed out, learning is an ongoing lifelong activity where learners change their expectations by seeking knowledge, which departs from traditional approaches. As time goes by, they will have to expect and be willing to seek out new sources of knowledge. Skills in using ICT will be an indispensable prerequisite for these learners.
5. ICT tends to expand access to education. Through ICT, learning can occur any time and anywhere. Online course materials, for example, can be accessible 24 hours a day, seven days a week. Teleconferencing classrooms allow both learner and teacher to interact simultaneously with ease and convenience. Based on ICT, learning and teaching no longer depend exclusively on printed materials. Multiple resources are abundant on the Internet, and knowledge can be acquired through video clips, audio sounds, visual presentation and so on. Current research has indicated that ICT assists in transforming a teaching environment into a learner-centered one (Castro Sánchez and Alemán 2011). Since learners are actively involved in the learning processes in ICT classrooms, they are authorized by the teacher to make decisions, plans, and so forth (Lu, Hou and Huang 2010). ICT therefore provides both learners and instructors with more educational affordances and possibilities.

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6. As Brush, Glazewski and Hew (2008) have stated, ICT is used as a tool for students to discover learning topics, solve problems, and provide solutions to the problems in the learning process. ICT makes knowledge acquisition more accessible, and concepts in learning areas are understood while engaging students in the application of ICT.
7. Support student-centered and self-directed learning. Students are now more frequently engaged in the meaningful use of computers (Castro Sánchez and Alemán 2011). They build new knowledge through accessing, selecting, organizing, and interpreting information and data. Based on learning through ICT, students are more capable of using information and data from various sources, and critically assessing the quality of the learning materials.

Conclusion

ICTs do have certain seductive qualities. The resources themselves are visually appealing and clever and can make us feel good about working at the cutting edge of innovation. Therefore, in the excitement to get on board with the new technologies, a considered evaluation of their merits is very necessaryso that the pupils become responsible and resilient users of technology, should be able to make confident and safe use of the web and of other internet-based services and also able to detect and deal with issues when they arise….as summarized by UK's Computing in the National Curriculum Guide. ICT is used for communication between students and teachers, in which internet, laptops and simulations are being used and (consequently) in which a variety of learning environments are possible. Teacher-centred and whole-class instruction is no longer the dominant teaching method. Other essential points are the booms in the field of ICT and the large availability of information. As a result, with the use of ICT in classroom settings there will be less time for passing on information and more receptive environment to facilitate easy learning. Whether one is a pupil, a teacher, an employee or simply a citizen, we should all have the right – and the means – to be resilient users of technology.

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