ICT in Teacher Education: Present Role and Importance

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ABSTRACT   *ICTs are making dynamic changes in society. They are influencing all aspects of life. The influences are felt more and more at schools. Because ICTs provide both students and teachers with more opportunities in adapting learning and teaching to individual needs, society is, forcing schools aptly respond to this technical innovation. Therefore, this review article discusses the roles of ICTs, the promises, limitations and key challenges of integration to education systems. The review attempts in answering the following questions: (1) What are the benefits of ICTs in teacher education? (2) What are the existing promises of ICT use in teacher education systems of some developing countries? (3) What are the limitations and key challenges of ICTs integration to education systems? The review concludes that regardless of all the limitations characterizing it, ICT benefits education systems to provide quality education in alignment with constructivism, which is a contemporary paradigm of learning.*

Key words: ICT, teacher education.

The role of technology, in a traditional school setting, is to facilitate, through increased efficiency and effectiveness, the education of knowledge and skills. Efficiency will be defined as the quickness by which we obtain knowledge, while the term effectiveness is associated with the amount of imparted knowledge that is operationally mastered. When technology is directly applied to an educational setting, such as a school, both the students and teachers can be viewed as learners. Thus, we can operate under the assumption that any increase in teacher knowledge and utilization has the impact of increased learning in students. Ultimately, technology should serve to increase student achievement in schools.

For teachers, technology, in accordance with knowledge management principles, can be used to develop databases that will alter professional development. One emerging database technology is known as the electronic performance support system (EPSS). An EPSS provides professional development and job related assistance whenever an individual may need such information (McKay & Wagner, 2007). An EPSS goes beyond the simple information storage functions of a database, and can also provide case studies, templates, and situational examples for use by the individuals (McKay & Wagner, 2007). For example, if a teacher has a question on how to write lesson plans in accordance with school district requirements, they could go to an EPSS provided by the district and find instructions and information on how to perform their task. This support system allows the teacher to receive help in a very time efficient manner, as the teacher is not required to find an individual who has the specific knowledge and the time required to instruct the teacher. In addition, the higher the sponsor of the EPSS, such as a federal government sponsored EPSS, the greater the numbers of individuals that can be served by a single database and adhere to the same standards of job performance. Thus in regards to the effect of technology on the field of education, technology will continue to have an impact, in terms of both how we train our teachers and how those teachers instruct their students.

Specifically, technology can remove physical barriers to learning, such as geographic proximity and financial costs, through technology that facilitates distance learning. In addition, the increasing prevalence of databases can be used for job performance assistance as well as changing the way we teach students, giving a new focus on skill based performance over knowledge retention. Even though ICTs play significant roles in representing equalization strategy for developing countries, the reality of the digital divide- the gap between those who have access to, and control technology and those who do not, make a huge difference in the use of ICTs. This means, that the introduction and integration of ICTs at different levels and various types of education is the most challenging undertaking. Failure to meet the challenges would mean a further widening of the knowledge gap and deepening of existing economic and social inequalities among the developed and the developing countries. Thus, the purpose of this review article is to discuss the benefits of ICT use in education, in the enhancement of student learning and experiences of some countries in order to encourage policy makers, school administrators, and teachers pay the required attention to

integrate this technology in their education systems. In so doing, it highlights the benefits of ICT in education, existing promises, and the limitations and challenges of integration to education systems.

In recent years however, there has been a growing interest to know how computers and internet can best utilized to improve effectiveness and efficiency of education at all levels and in both formal and non-formal settings. As there is a shift of theories explaining learning processes, ICTs become handmaiden for learning activities. Voogt's (2003) description on the major roles, distinguished ICTs as an object for study, an aspect of a discipline or a profession, and a medium of instruction. As a medium of instruction, ICTs fit to realize and implement the emerging pedagogy of constructivism (Davis, 1997; Office of Technology Assessment, 1995; Panel on Educational Technology, 1997; Watson, 1996) in Voogt (2003). Moreover, Voogt (2003) differentiated between traditional learning setting and constructivist approaches. The former considers learning as transmission of knowledge to students, which is the sole responsibility of the teacher. On the other hand, the constructivist approach considers learning as authentic and learner centred. ICT, the computer for example is a great help in the constructivist approach, where one can design simulated and individualized learning environments to students.

Active learning: - ICT-enhanced learning mobilizes tools for examination, calculation and analysis of information in order to provide a platform for student inquiry, analysis and construction of new information. The learners therefore, learn as they do and, whenever appropriate work on real-life problems in-depth. Moreover, ICT makes the learning less abstract and more relevant to their life situations. In contrast to memorization-based or rote learning, that is the feature of traditional pedagogy; ICT-enhanced learning promotes increased learner engagement. ICT-enhanced learning can also be 'just-in-time' learning that the learners choose what to learn when they need.

Collaborative learning: - ICT-supported learning encourages interaction and cooperation among students, teachers, and experts regardless of where they are. Apart from modelling real world interactions, ICT-supported learning provides opportunity to work with students from different cultures, thereby helping to enhance learners teaming and communication skills as well as their global awareness. It models learning done throughout the learner's lifetime by expanding the learning pace to include not just peers but also mentors and experts from different fields.

Creative learning: - ICT-supported learning promotes the manipulation of existing information and the creation of real-world products rather than the duplication of received information.

Integrative learning: - ICT-enhanced learning promotes a thematic integrative approach to teaching and learning. This approach eliminates the artificial separation between the different disciplines and between theory and practice, which characterizes the traditional approach. **Evaluative learning:** - ICT-enhanced learning is student-directed and diagnostic. Unlike static, text or print-based education, ICT-enhanced learning recognizes the presence of different learning pathways to explore and discover rather than merely listen and remember.

Through continued usage and development, information systems may be accepted on the level of calculators, a technology tool designed to remove excessive memorization and lengthy calculations. In conclusion, technology has already served an important role in education in multiple fields. Specifically, technology has been of great use to the educational field in terms of its focus on improving the effectiveness and efficiency of the educational experiences of both students and teachers. Continued use and development of technology can serve to further benefit the educational field and recommendations based on the development of existing trends in education should be pursued for great gains in educational achievement.

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Leadership is the capacity to translate vision into reality.

~ Warren G. Bennis