

THE ROLES OF INFORMATION & COMMUNICATION TECHNOLOGIES IN EDUCATION

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Abstract

This paper discusses the Roles of ICT in education. Information communication Technologies (ICT) at present are influencing every aspect of human life. They are Playing salient roles in work places business, education, and entertainment. Moreover, many people recognize ICTs as catalysts for change; change in working conditions, handling and exchanging information, teaching methods, learning approaches, scientific research, and in accessing information. Therefore, this paper 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 education? (2) What are the existing promises of ICT use in 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.

INTRODUCTION

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. ICTs greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution, and widen the range of opportunities for business and the poor. One of the greatest hardships endured by the poor, and by many others, who live in the poorest countries, in their sense of Isolation, and ICTs can open access to knowledge in ways unimaginable not long ago we must ensure that information and communication technologies (ICTs) unlock the door of education systems. This indicates the growing demand and increasingly important place that (ICTs)could receive in education. Since ICTs provide greater opportunity for students and teachers to adjust learning and teaching to individual needs, society is, forcing schools to give appropriate response to this technical innovation. 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 paper 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 educational systems.

The Benefits of ICT in Education

The uses of ICT are making major differences in the learning of students and, teaching approaches. Several studies reveal that students using ICT facilities mostly show higher learning gains than those who do not use. The use of ICTs in education also shifts the learning approaches. There is a common belief that the use of ICTs in education contributes to a more constructivist learning and an increase in activity and greater responsibility of students. This limits the role of the teacher to supporting, advising, and coaching students rather than merely transmitting knowledge. The gradual progress in using computers changes from learning about computers, to learning computers, and finally to learning with computers. Most often, secondary teachers use computers for drill-and-practice and word processing. 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. As a medium of instruction, ICTs fit to realize and implement the emerging pedagogy of constructivism.

Learning Resources: Traditional Medium and ICT Medium

Moreover, the difference 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 centered. ICT, the computer for example is a great help in the constructivist

approach, where one can design simulated and individualized learning environments to students.

ICTs are exerting impacts on pedagogical approaches in the classrooms. Their contribution to changes in teaching practices, school innovation, and community services is considerable. Three significant concerns of consideration regarding ICTs impact on education. Firstly, student outcomes such as higher scores in school subjects or the learning of entirely new skills needed for a developing economy. Secondly, we should consider teacher and classroom outcomes such as development of teachers' technology skills and knowledge of new pedagogic approaches as well as improved attitudes toward teaching. Finally, one has to consider other outcomes such as increased innovativeness in schools and access of community members to adult education and literacy. In traditional medium lectures books etc. are used as learning recourses and in the case of ICT medium, computers, multimedia, internet, lecture, books etc. are very effectively used in class rooms. So, the emerging pedagogy of constructivism that fits to the use of ICT to increase students involvement in learning

ICT in Constructivist Class Room

Emerging Pedagogy is the name given to the new view of constructivist learning when compared to the relatively long existing behaviorist view of learning.

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 modeling 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.

ICT provides a great deal of advantage in the delivery of equitable quality education there by providing an opportunity to improve the lives of our people. The need to use new technologies to raise the quality and efficiency of education cannot be overemphasized. It is imperative that we expose our children, parents, and teachers to ICT to improve the quality of education and technical proficiency of our human resources, thus leading to increased productivity and accelerated development. We must also prepare our citizens to adapt to the global economy and participate in electronic commerce. In addition, we must provide our

children with a greater understanding of other peoples and cultures, thus defending our renewed legacy of peace and tolerance.

BENEFITS OF ICT IN EDUCATION

- Offer the opportunity for more student-centered teaching,
- Provide greater opportunity for teacher-to-teacher and student-to student communication and collaboration,
- Give greater exposure to vocational and workforce skills for students,
- Provide opportunities for multiple technologies delivered by teachers,
- Create greater enthusiasm for learning amongst students,
- Provide teachers with new sources of information and knowledge,
- Prepare learners for the real world,
- Provide distance learners country-wide with online educational materials
- Provide learners with additional resources to assist resource-based

learning. Furthermore, the document states ICTs to cover all the technologies used for holding and communicating information and their use specifically in education with overall policy goals of:

- Producing ICT literate citizens,
- Producing people capable of working and participating in the new economies and societies arising from ICTs and related developments,
- Leveraging ICT to assist and facilitate learning for the benefit of all learners and teachers across the curriculum,

□□ Improving the efficiency of educational administration and management at every level from the classroom, school library, through the school and on to the sector as a whole,

□□ Broadening access to quality educational services for learners at all levels of the education system, and

□□ Set specific criteria and targets to help classify and categorize the different development levels of using ICT in education.

Limitations of ICT use in Education

ICT as a modern technology that simplifies and facilitates human activities is not only advantageous in many respects, but also has many limitations. Many people from inside and outside the education system, think of ICT as “Panacea” or the most important solution to school problems and improvements. However, many conditions can be considered as limitations of ICT use in education. The limitations can be categorized as teacher related, student related, and technology related. All of them potentially limit the benefits of ICT to education.

Limitations of ICT use in education as related to student behavior

□□ Computers limit students ‘imagination,

□□ Over-reliance on ICT limits student’s critical thinking and analytical skills,

□□ Students often have only a superficial understanding of the information they

Download.

□□ Computer-based learning has negative physical side-effects such as vision

Problem.

□□ Students may be easily distracted from their learning and may visit unwanted sites.

□□ Students tend to neglect learning resources other than the computer and

Internet.

- Students tend to focus on superficial presentations and copying from the

Internet.

- Students may have less opportunity to use oral skills and hand writing.

Use of ICT may be difficult for weaker students, because they may have problems with working independently and may need more support from the teacher.

The other limitation of ICT use in education is technology related. The high cost of the technology and maintenance of the facilities, high cost of spare parts, virus attack of software and the computer, interruptions of internet connections, and poor supply of electric power are among the technology related limitations of ICT use in education.

Teachers Attitude Towards ICT

Teachers' attitude plays an important role in the teaching-learning process that utilizes computers and internet connections. Although teachers' attitude towards use of these technologies is vital, many observations reveal that teachers do not have clarity about how far technology can be beneficial for the facilitation and enhancement of learning. Of course, some teachers may have positive attitudes to the technology, but refrain from using it in teaching due to low self-efficacy, tendency to consider themselves not qualified to teach with technology. In this respect, Bandura (1986) describes self-efficacy as "individual's opinion of capabilities to organize and perform courses of actions to achieve particular types of performances." Moreover, as identified by Brosnan (2001), attitude, motivation, computer anxiety, and computer self-efficacy are factors affecting teachers' use of computers in their lessons. Teacher resistance and lack of enthusiasm to use ICT in education may also be another

limitation. Furthermore, many teachers may not have the required IT skills and feel uncomfortable, nor do they have trainings needed to use the technology in their teaching. Unless teachers develop some basic skills and willingness to experiment with students, ICT use in education is in a disadvantage. On the other hand, the limitation of ICT use in education is related to student behavior. Appropriate use of computer and the internet by students have significant positive effects on students' attitude and their achievement. Nonetheless, it is very common to observe limitations related to student behavior. Students tend to misuse the technology for leisure time activities and have less time to learn and study. Internet access at home, for instance, may be a distraction because of chat rooms and online games, reducing the time spent in doing assignments and learning. Therefore, the impact of availability of ICT on student learning strongly depends on its specific uses. If ICT is not properly used, the disadvantage will outweigh the advantage. For example, while students use the internet, it may confuse them by the multiplicity of information to choose from. As a result, the teacher spends much time to control students from websites unrelated to the learning content. Then, for caution, it is important to identify the major limitations of ICT use in education as related to student behavior. The various literature in the area, identify the following

The Key Challenges of ICTs Integration in Education

The integration of ICTs in education systems may face various challenges with respect to policy, planning, infrastructure, learning content and language, capacity building and financing. ICT-enhanced education requires clearly stated objectives, mobilization of resources and political commitment of the concerned bodies. The issues such as analysis of current practices and arrangements, identification of potential drives and barriers, curriculum and pedagogy, infrastructure and capacity building to be considered in the formulation of policy and planning.

In addition, it is wise to specify educational goals at different education and training levels as well as the different modalities of ICT use that can facilitate in the pursuit of the goals. Policy makers then, need to know the potentials of ICTs in applying different contexts for different purposes. Other challenging points at the level of policy and planning are identification of stakeholders and harmonization of efforts across different interest groups, the piloting of the chosen ICT-based model, and specification of existing sources of financing and the development of strategies for generating financial resources to support ICT use over the long term. The infrastructure challenges that may exist are absence of appropriate buildings and rooms to house the technology, shortage of electric supply and telephone lines, and lack of the different types of ICTs. Because of this, one need to deal with infrastructure related challenges before the planning of ICTs integration to education systems.

Suggestion for Effective Use ICT in Education

- The teachers should increase the use of ICT for preparation of the teaching-learning materials
- The authority should motivate teachers to use ICT
- Training should be provided to the teachers for developing skills required for using ICT

Conclusion

With respect to challenges of capacity building, we have to develop competencies of teachers and school administrators for the successful integration of ICT in the education system. In fact, one impeding factor of ICTs integration in education systems is the skill gap of people implementing it. For instance, teachers need professional development to gain skills with particular applications of ICT, integration. This paper attempts to answer questions on the roles of ICTs in education, existing promises, limitations and the challenges of its integration in

education systems. Information communication technologies are influencing all aspects of life including education. They are Promoting changes in working conditions, handling and exchanging of information, teaching-learning approaches and so on. One area in which the impacts of ICT is significant, is education. ICTs are making major differences in the teaching approaches and the ways students are learning. ICT-enhanced learning environment facilitates active, collaborative, creative, integrative, and evaluative learning as an advantage over the traditional method. In other words, ICT is becoming more appropriate in the realization and implementation of the emerging pedagogy of constructivism that gives greater responsibility of learning for students. Several surveys are showing that ICT use in education systems of developed nations has comparatively advanced than ICT use in education systems of developing nations. In addition, the major promises of ICTs use in education systems of developing countries focus on training teachers in new skills and introducing innovative pedagogies into the classrooms, investing on ICT infrastructure for schools and creating networks among educational institutes, improving overall standard of education by reducing the gap in quality of education between schools in urban and rural areas, initiation of smart school with objectives to foster self-paced, self assessed, and self-directed learning through the applications of ICTs, and developing ICT policy for education and training. On the other hand, this article discusses the major limitations of ICT use in education as teacher related, student related, and technology related.

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