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ICT and Quality Teaching- An Integrated Approach

Dr. Pooja Arora
Assistant Professor, M. K. College of Education, Jalandhar, Punjab, India

Abstract
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. As new concepts of learning have evolved, teachers are expected to facilitate learning and make it meaningful to individual learners rather than just to provide knowledge and skills. Recent developments of innovative technologies have provided new possibilities to teaching profession but at the same time have placed more demands on teachers to learn how to use these technologies in their teaching. Moreover quality of teaching has been raised by the development of new broadband communication services and convergence of telecommunication with computers. Information and communication technologies (ICTs) are widely believed to be important potential levers to introduce and sustain education reform efforts. Despite evidence of increasingly widespread use of ICTs in education initiatives around the world, however, there is little guidance available for policy makers and donor staff specifically targeted at countries contemplating the use of ICTs to help countries meet the education-related Millennium Development Goals.

Introduction

Globally, educational systems are under great pressure to adopt innovative methodologies and to integrate New Information and Communication Technologies (NICTs) in the teaching and learning process, to prepare students with the knowledge and skills they need in the 21st century. Apparently, teaching profession is evolving from an emphasis on teacher-centered, lecture- based instructions to student-centered interactive learning environments. NICTs integration is understood as the usage of technology seamlessly for educational processes like transacting curricular content, students working on technology to do authentic tasks and developing technology supported products, providing authentic assessments and institutional development. Today a variety of NICTs can facilitate not only delivery of instruction but also learning process itself. Moreover, NICTs can promote international collaboration and networking in education and professional development. There is a range of NICTs options- from Videoconferencing through multimedia delivery to websites which can be used to meet the challenges teachers face today. In fact, there has been increasing evidence that NICTs may be able to provide more flexible and effective ways for lifelong professional development of teachers. Undoubtedly NICTs has brought about many challenges and opportunities for education. The educational system needs to come to terms with these new challenges and take full advantage of the opportunities. If educational institutions have to ensure that their students leave the institutions as confident individuals capable of using new technology creatively and productively then their teachers should have the competence to integrate the emerging technologies and the digital content with all their operations. Therefore, the challenge for higher education institutions, particularly teacher education, has been to create a new generation of teachers capable of employing a variety of technology tools into all phases of academic, administrative, research, and extension functions. A teacher being a pivot in the process of teaching learning, knowledge of ICT and skills to use ICT in teaching learning has gained immense importance for today's teacher. A teacher is expected to know successful integration of ICT into his/her subject area to make learning meaningful. This knowledge development during pre-service training has gained much importance with the notion that exposure to ICT during this time is helpful in increasing student teachers' willingness to integrate technology for classroom teaching.

Education around the world is experiencing major paradigm shifts in educational practices of teaching and learning under the umbrella of ICT enabled learning environment. Whereas learning through facts, drill and practices, rules and procedures was more adaptive in earlier days, learning through projects and problems, inquiry and design, discovery and invention, creativity and diversity, action and reflection is perhaps more fitting for the present times. The major hallmark of this learning transition is from teacher centered to learner focus paradigm. During the last three decades, the changes in educational environment have been phenomenal. The model, focus, role of the learner and technology has been changed drastically from traditional instruction to virtual learning environment as depicted below:

Changing in Teaching-learning Environment

Model	Focus	Role of Learner	Technology
Traditional	Teachers	Passive	Chalk & Talk
Information	Learners	Active	Personal Computer
Knowledge	Group	Adaptive	PC + Network

The knowledge revolution and role of the teacher

The pace of technological revolution and emergence of a knowledge society has changed the traditional role of the teacher and the students. Traditionally, the teacher used to be the source of knowledge for the students and the main source of knowledge remained limited to text book. The development of ICT has changed the epic centre of knowledge. At present, in a number of cases the student is more informed than the teacher. Furthermore, there is likely to be confusion in the teachers mind about his/ her new role in relation to the use of these technologies i.e. teachers find themselves in a situation where they are no longer the principle source for delivery of information. In the new phase of the knowledge revolution the source of knowledge has shifted from a one source to a different source. In other words, we can say that there is a decentralization of the knowledge source. This has an overall impact on the development of learning abilities among the children.

ICT a solution for the improvement of the expertise of teacher

ICT enabled distance education is poised to rule the world. This would not only strengthen the elementary education needs of the country but would also increase the dependence of education on ICT. Technological development always warrants transition to newer technologies by jeopardizing the cost effectiveness of the

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distance education programme. Retaining the already existing technologies for a considerable period of time and subsequently embracing new technologies should have fine balancing, so as to improve also the quality of education. India is one among the few countries in the world, which has not allowed the expenditure on education to shrink over the years. The increase in expenditure on elementary education alone over the last four Five Year Plan periods has been more than the increase in expenditure on education as a whole. With all the inputs around, there is only hope for enhancing the quality of education at the elementary stage.

Role of Teacher in Enhancing Learning Achievement of Child

Education, as we know is instrumental in ensuring that the future generation is well informed and competent. Unfortunately, because the quality and accessibility of education varies so greatly between regions, the school system of our country often fails to deliver the level of education necessary to ensure such competency. Many schools have limited resources for buying books, stationery, furniture and other classroom materials. Teachers lack adequate qualification and training to engage their students in learning. Their lesson plans are most often outdated or irrelevant. These jeopardize the available quality of education. ICT enabled distance education, to a great extent, can combat this problem. Because the present day distance learning is ICT-enabled, most of the programmes include computer and Internet training to facilitate the use of essential technology. The acquisition of fundamental ICT skills among teachers and students helps knowledge sharing, thereby multiplying educational pportunities. However, all teachers are not willing to introduce new technologies to themselves first and subsequently to their students. In order to implement ICT-driven distance education programmes, the teachers must first understand and be comfortable with the technologies. They must be given opportunities for acquisition of a new knowledge. This can begin by promoting computer-training programmes for teachers. Monetary incentives can be offered as means of motivation. The use of ICT can effectively enhance learning where traditional models have failed. While these technologies offer advantages, they also pose challenges. Several studies have been conducted in the west about the use of ICT in Middle and High School students. One such study is by Martin Carnoy 14 which is entitled-Education: Possibilities and Challenges-2004-05 Academic Year. According to him, 'Using ICT as a supplement to improve test score results, may, however, be seen to be more effective than traditional teaching one, hence is much more applied.' He also comments about the use of ICT for teacher and administrator training. 'Private firms such as Sylvan quickly saw the potential of ICT as an in-service training medium for teachers, and this now forms an important part of Sylvan's extensive ICT learning systems… An entirely different approach to teacher improvement is web access to course content, lesson plans and network to other teachers. This database or content, approach is used by Net Schools and the IBM foundation. Both these organizations focus on using ICT as teacher training for course content rather than improving pedagogy.'(UNESCO) It can be seen that Distance Learning Technologies have been employed in the education of teachers both at preservice level and at the in-service level. UNESCO has published a summary of case studies conducted in nine countries in different parts of world and most of these studies reflect the necessity of having multi-prong strategies for teacher education and to improve their expertise. For example, 'in China television has been tremendously used for teacher education. In India, there is a multimedia approach for teacher education. In UK, due to heavy shortage of teachers of Mathematics and Science, the Department of Education invited tenders…the Open University was successful in this and the result was Open University's Post Graduate Certificate of Education (PGCE) programme, where ICT plays a large role in enabling interaction between students, tutors, regional support centres and programme providers '.

ICTs and Teacher Education

There are a variety of approaches to professional development of teachers in the context of use of ICTs in education. Professional development to incorporate ICTs into teaching and learning is an ongoing process and should not be thought of as one 'injection' of training. Teachers need to update their knowledge and skills as the school curriculum and technologies change. Two aims of teacher training are fundamental: teacher education in ICTs; and teacher education through ICTs.

Teacher Education in ICT

The most obvious technique for professional development for teachers is to provide courses in basic ICTs knowledge and skills. It is necessary for teachers to become skilled in operating the new technologies and in exploiting them effectively as educational tools. Teachers must master the use of information – skills of research, critical analysis, linking diverse types and sources of information, reformulating retrieved data – if they are to teach their pupils to develop these same skills. There needs to be more emphasis placed on training in pedagogy, as opposed to the current trend in many education systems where the major focus is on specialized knowledge in specific curricular subjects. Teachers must be adequately equipped with more didactic competencies so as to assume their new role as experts in the learning process.

Teacher Education through ICTs

ICTs can support effective professional development of teachers. Using ICTs as tools for training of teachers is as important as introducing the basics of ICTs to the prospective teachers. As sources of information and expertise, as well as tools for distance communication, ICTs can offer many new possibilities for teacher education. Teachers may through the regular use of these technologies promote collaborative learning which include group problem solving activities and articulated projects thereby giving better value to students, improving learning abilities and thus increasing learner's performances.

Role of ICT in bringing efficiency of delivery mechanisms

Efficient delivery mechanisms are an important component of overall school management. ICTs can provide the efficiency of delivery mechanisms of educational services by supplementing conventional delivery mechanisms:

(i) Technology's capacity to reach learners in any place and at any time has the potential to promote revolutionary changes in the educational paradigm. This means eliminating the premise that learning time equals classroom time. Students can be encouraged to revisit the lessons/topics to reinforce learning without active intervention by teachers.

(ii) Another illustration of efficiency is the domain of virtual laboratories. All school systems want to provide labs because science is empirical. But few schools have furnished them

with equipment and supplies and fewer yet are willing to risk using them. Technology allows for video and digital demonstrations as well as digital simulation of laboratory activities in a very real manner – but without the risks and costs associated with laboratory experiments. Simulations will not replace hands-on activity completely. Rather, they prepare the learner to conduct real-life experiments in the same manner as flight simulations prepare the student pilot for test flying.

(iii) Multimedia-enabled learning modules can be developed by a group of master teachers and instructional designers, which can then be shared with all schools to assure quality standards of learning delivery.

(iv) Concerns about costs are always raised in discussions related to technology. Depending on the technology used, start-up costs can be high but economies of scale are significant. That is, the more the technology is used i.e. when more students use the product, the unit costs of producing educational content ware decrease proportionately. Trade-offs must be considered as well when evaluating technology's initial costs.

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