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Enhancing Learning and Teacher Education through ICT in Changing Scenario

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Abstract:

Quality in education is rapidly evolving over time. Quality education is informed by the past; it is relevant to the present context and prepares the individuals for the future to lead a balanced life. Information and communication technologies (ICTs) are a major factor in shaping the new global economy and producing rapid changes in society. Within the past decade, the new ICT tools have fundamentally changed the way people communicate and do business. They have produced significant transformations in various fields of transaction. They also have the potential to transform the nature of education, where and how learning takes place and the roles of students and teachers in the learning process. For education to reap the full benefits of ICTs in learning, it is essential that pre-service and in-service teachers have basic ICT skills and competencies. Teacher education institutions and programmes must provide the leadership for pre-service and in-service teachers and model the new pedagogies and tools for learning. They must also provide leadership and accountability in determining how the new technologies can best be used in the context of the culture, needs, and economic conditions within the country. Teacher education institutions also need to develop strategies and plans to enhance the teaching-learning process within teacher education programmes and to assure that all future teachers are well prepared to use the new tools for learning.

Key Words: Learning, Teacher Education, ICT

Introduction:

Education is a complex social, cultural and ethical process designed in a social or cultural context. It is related with social structures, cultural environments, values and ideals of people, society and the government. All these factors are dynamic. By all these the definition of teaching has been changing depending on time, place and society. A good teaching may be designed to affect maximum learning. In the context of global policy, global society and global economy, each and every country is seriously thinking of heightening the degree of quality in the system of education. Quality in education is rapidly evolving over time. Quality education is informed by the past (e.g. indigenous and traditional knowledge), it is relevant to the present context and prepares the individuals for the future to lead a balanced life.

Information and communication technologies (ICTs) are a major factor in shaping the new global economy and producing rapid changes in society. Within the past decade, the new ICT tools have fundamentally changed the way people communicate and do business. They have produced significant transformations in industry, agriculture, medicine, business, engineering and other fields. They also have the potential to transform the nature of education, where and how learning takes place and the roles of students and teachers in the learning process.

Teacher education institutions may either assume a leadership role in the transformation of education or be left behind in the swirl of rapid technological change. For education to reap the full benefits of ICTs in learning, it is essential that pre-service and in-service teachers have basic ICT skills and competencies. Teacher education institutions and programmes must provide the leadership for pre-service and in-service teachers and model the new pedagogies and tools for learning. They must also provide leadership and accountability in determining how the new technologies can best be used in the context of the culture, needs, and economic conditions within the country. To accomplish these goals, teacher education institutions must work closely and effectively with K-12 teachers and administrators, national or state educational agencies, teacher unions, business and community organizations, politicians and other important stakeholders in the educational system. Teacher education institutions also need to develop strategies and plans to enhance the

teaching-learning process within teacher education programmes and to assure that all future teachers are well prepared to use the new tools for learning.

Education is at the confluence of powerful and rapidly shifting educational, technological and political forces that will shape the structure of educational systems across the globe for the remainder of this century. Many countries are engaged in a number of efforts to effect changes in the teaching - learning process to prepare students for information and technology based society.

The UNESCO World Education Report (1998) notes that the new technologies challenge traditional conceptions of both teaching and learning and, by reconfiguring how teachers and learners gain access to knowledge, have the potential to transform teaching and learning processes. ICTs provide an array of powerful tools that may help in transforming the present isolated, teacher-centered and text-bound classrooms into rich, student- focused, interactive knowledge environments. To meet these challenges, schools must embrace the new technologies and appropriate the new ICT tools for learning. They must also move toward the goal of transforming the traditional paradigm of learning. To accomplish this goal requires both a change in the traditional view of the learning process and an understanding of how the new digital technologies can create new learning environments in which students are engaged learners, able to take greater responsibility for their own learning and constructing their own knowledge. Thomas Kuhn suggests that revolutions in science come about when the old theories and methods will not solve new problems. He calls these changes in theory and methods a "paradigm shift." There is widespread concern that the educational experiences provided in many schools will not prepare students well for the future. Many educators and business and government leaders believe that creating a paradigm shift in views of the learning process, coupled with applications of the new information technologies, and may play an important role in bringing educational systems into alignment with the knowledge-based, information-rich society.

The Traditional View of the Learning Process:

The traditional, teacher-centered approach to learning is illustrated as the teacher is the expert and the dispenser of knowledge to the students. It is largely a 'broadcast' model of learning where the teacher serves as the repository and

transmitter of knowledge to the students. The traditional educational paradigm is often characterized by the following views of learning:

- **Learning is hard:** Learning as a difficult and often tedious process.
- **Learning is based on a deficit model of the student:** To make up or remediate learning is most obvious in compensatory education programmes.
- **Learning is a process of information transfer and reception**: Teacher-centered learning reduces students to passive recipients of information and fails to develop their thinking skills.
- **Learning is an individual & solitary process**: Students working alone at their desks completing worksheets or repetitive tasks and unanimously rejected this daily ordeal of dull and ritualistically solitary classroom activity.
- **Learning is facilitated by breaking content, instruction into small isolated units:** The educational system is often geared more too categorizing and analyzing patches of knowledge than to sewing them together.
- **Learning is a linear process:** The textbook or teacher provides only one linear path through a narrowly bounded content area or sequence of standardized instructional units.

Changes in Views of the Learning Process:

In contrast to the traditional teaching-learning paradigm, a new paradigm of the teaching-learning process is emerging, based on three decades of research in human learning that encompasses the following views of the human learning process:

- **Learning is a natural process**: The natural state of the brain is to learn. There are different learning, perceptual and personality styles that must be considered in the design of learning experiences for the individual student. Given interesting and rich learning environments, and supportive and stimulating teachers, students will learn.
- **Learning is a social process**: The communal context of knowledge and learning is beginning to be rediscovered, students learn best in collaboration with peers, teachers, parents, and others when they are actively engaged in meaningful, interesting tasks. ICTs provide opportunities for teachers and students to collaborate with others across the country and across the globe. They also provide new tools to support this collaborative learning in the classroom and online.

- **Learning is an active and not a passive process:** In most fields, people are faced with the challenge of producing knowledge rather than simply reproducing knowledge. To allow students to move toward competence, they must be actively engaged in the learning process, in activities such as solving real problems, producing original writing, completing scientific research projects (rather than simply studying the subjects), dialoguing with others on important issues, providing artistic and musical performances, and constructing physical objects.
- **Learning may either be linear or non-linear**: The mind is a wonderful parallel processor that may attend to and process many different types of information simultaneously. Cognitive theory and research sees learning as a reorganization of knowledge structures. The knowledge structures are stored in semantic memory as schema or cognitive maps. Students "learn" by augmenting, combining, and rearranging a collection of cognitive maps, many of which overlap or are interconnected through a complex network of associations. ICT provides many ways to students to acquire and to process the information and assimilate it into their existing knowledge structures.
- **Learning is integrative and contextualized:** Pribram's holistic brain theory suggests that information presented globally is more easily assimilated than information presented only in a sequence of information elements It is also easier for students to see relations and to make connections. The teacher's role is to help them in several ways to make connections and to integrate knowledge.
- **Learning is based on a strength model of student abilities, interest, and culture:** Based on the work of Howard Gardner and others, schools are beginning to consider the specific strengths and interests that students bring to the learning environment, and are designing learning activities that build on student strengths rather than focusing only upon remediating weaknesses. In addition, schools increasingly recognize diversity as a resource rather than a problem in the classroom. In contrast to the remedial and standardized concept of instruction, diversity and individual differences are valued and the learning process is designed to build on the strengths and assets brought by the learner to the classroom.
- **Learning is assessed through task completion, products, and real problem solving of both individual and group efforts:** Rather than simply evaluating students through paper and pencil tests, assessments are made using portfolios of actual performances and work in both collaborative and individual learning tasks.

The traditional view of the learning process is typically teacher-centered, with teachers doing most of the talking and intellectual work, while students are passive receptacles of the information provided. This is not to indicate that the traditional lecture method is without value, as it allows the teacher to quickly convey lots of information to students and is a useful strategy for recall or rote learning. However, it is not the most effective way to help students develop and use higher order cognitive skills to solve complex real world problems. Today's students no longer want to be passive recipients in the information transfer model of learning. Rather they want to be active participants in the learning process. There is growing recognition that today's world requires that students be able to work collaboratively with others, think critically and creatively, and reflect on their own learning processes.

Educational Environment Shifts From Teaching to earning:

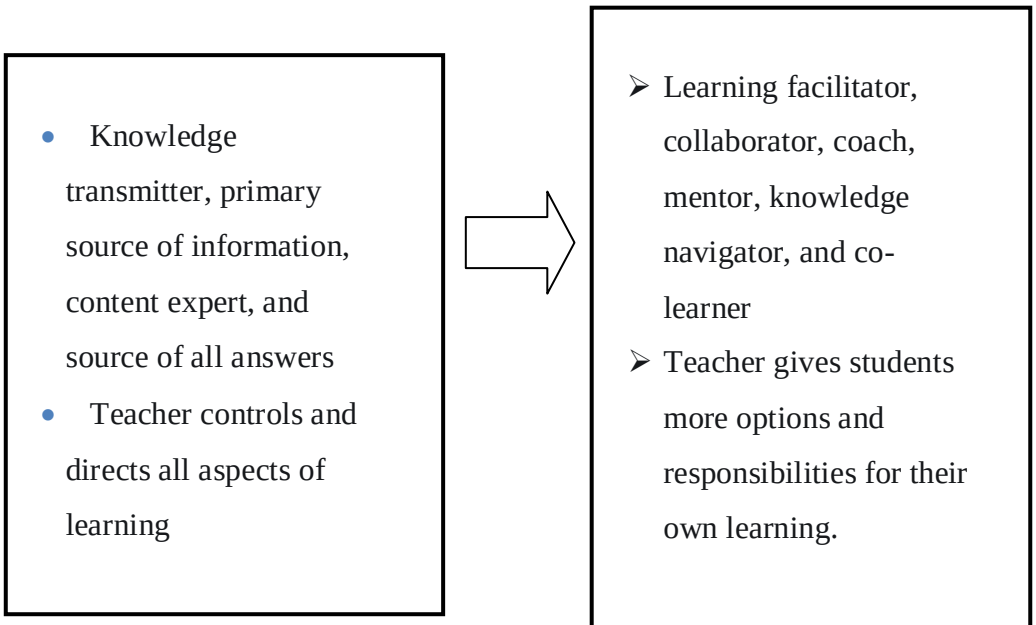
As technology has created change in all aspects of society, it is also changing our expectations of what students must learn in order to function in the new world economy. Students will have to learn to navigate through large amounts of information, to analyze and make decisions, and to master new knowledge domains in an increasingly technological society. They will need to be lifelong learners, collaborating with others in accomplishing complex tasks, and effectively using different systems for representing and communicating knowledge to others. A shift from teacher-centered instruction to learner-centered instruction is needed to enable students to acquire the new 21st century knowledge and skills, identifies the shift that will take place in changing from a focus on teaching to a focus on learning.

	Teacher centered learning environment	**Learner centered learning environment**
Classroom activity	Teacher-centered, Didactic	Learner-centered, Interactive
Teacher role	Fact teller, Always expert	Collaborator, Sometimes learner
Instructional emphasis	Facts' memorization	Relationships, Inquiry and invention
Concepts of knowledge	Accumulation of facts,	Transformation of facts

	Quantity	
Demonstration of success	Norm referenced	Quality of understanding
Assessment Multiple	Multiple choice items	Criterion referenced, Portfolios and performances
Technology use	Drill and practice	Communication, access, collaboration, expression

Shifting the emphasis from teaching to learning can create a more interactive and engaging learning environment for teachers and learners. This new environment also involves a change in the roles of both teachers and students. The role of the teacher will change from knowledge transmitter to that of learning facilitator, knowledge guide, knowledge navigator and co-learner with the student. The new role does not diminish the importance of the teacher but requires new knowledge and skills. Students will have greater responsibility for their own learning in this environment as they seek out, find, synthesize, and share their knowledge with others. ICTs provide powerful tools to support the shift to student-centered learning and the new roles of teachers and students

The change in role of teacher



How can ICTs help to transform the learning environment into one that is learner-centered?:

Research has shown that the appropriate use of ICTs can catalyze the paradigmatic shift in both content and pedagogy that is at the heart of education reform in the 21st century. If designed and implemented properly, ICT supported education can promote the acquisition of the knowledge and skills that will empower students for lifelong learning. When used appropriately, ICTs especially computers and Internet technologies enable new ways of teaching and learning rather than simply allow teachers and students to do what they have done before in a better way. These new ways of teaching and learning are underpinned by constructivist theories of learning and constitute a shift from teacher centered pedagogy in its worst form characterized by memorization and rote learning to one that is learner-centered.

• **Active learning.** ICT enhanced learning mobilizes tools for examination, calculation and analysis of information, thus providing a platform for student inquiry, analysis and construction of new information. Learners therefore learn as they do and, whenever appropriate, work on real-life problems in depth, making learning less abstract and more relevant to the learner's life situation. In this way, and in contrast to memorization-based or rote learning, ICT enhanced learning promotes increased learner engagement. ICT enhanced learning is also "just-in-time" learning in which learners can choose what to learn when they need to learn it.

• **Collaborative learning.** ICT supported learning encourages interaction and operation among students, teachers, and experts regardless of where they are. Apart from modeling real-world interactions, ICT-supported learning provides learners the opportunity to work with people from different cultures, thereby helping to enhance learners' teaming and communicative skills as well as their global awareness. It models learning done throughout the learner's lifetime by expanding the learning space 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 regurgitation 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 that characterizes the traditional classroom approach.

• **Evaluative learning.** ICT enhanced learning is student-directed and diagnostic. Unlike static, text- or print-based educational technologies, ICT enhanced learning recognizes that there are many different learning pathways and many different articulations of knowledge. ICTs allow learners to explore and discover rather than merely listen and remember.

Teacher Training Approaches in Global Context:

Research indicates that ICT can change the way teachers teach and that it is especially useful in supporting more learner -centered approaches to instruction and in developing the higher order skills and promoting collaborative activities .Recognizing the importance of ICT in teaching and learning, a majority of the countries in the world have provided ICT teacher training in a variety of forms and degrees. Even though many teachers report that they have not had adequate training to prepare themselves to use technology effectively in teaching and learning, there seem to be several efforts around the world in which countries are effectively using technology to train teachers, and are training teachers to use technology as tools for enhancing teaching and learning. 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.

Various ICT teacher training efforts found in different countries into four categories using the framework in global context.

ICT use as main content focus of teacher training:

This approach has an emphasis on

- Teacher training in how to use ICT in the classroom.
- Selecting appropriate ICT tools and supporting students in the use of those tools,
- Using ICT to promote learning activities, developing new methods of facilitating learning and evaluating student performance.

The curriculum should revise to include three kinds of ICT courses for student teachers:

Basic ICT-skill workshops: Basic ICT skill workshops, paid for by students, are provided by external organizations and cover word processing, PowerPoint, Internet literacy, and other technical skills.

ICT foundation course: ICT foundation course covers: "learning, thinking and the effective use of instructional technologies in the classroom; instructional planning models; selecting, creating, evaluating, and integrating instructional technologies and resource materials; promoting creativity and complex thinking through ICT project work activities; and organizing and managing instructional activities with appropriate ICT resources in the classroom.

ICT elective course: A elective course covers the design and production of computer-based instruction.

In addition to this ICT integration into each curricular subject class must be recommended.

ICT use as part of teaching methods:

This approach integrates ICT into teacher training to facilitate some aspects of training. A variety of ICT are adopted as part of effective training methods. In this case, teachers are provided with examples of ICT-pedagogy integration in their training process. It uses videotape and CD-ROM to help teachers to see how technology can be integrated into their work. 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 video descriptions and demonstrations of how technology is used in teachers' classrooms. They provide "examples of real educators and learners using successful practices of technology to support instruction and learning in their classrooms." Video sequences are viewed by teachers' focus groups who then discuss the strategies and techniques of classroom management, assessment,

etc. In this specific case, teachers learn how to use ICT in their classrooms by actually being engaged in the process of ICT-integrated training. Another example of this approach can be found in the School Administrators' Technology Integration Resource project. It is a global initiative which provides tools and resources to help school administrators successfully integrate ICT into curriculum in their school. It includes how to provide technology, successful practices in introducing ICT, perspectives on staff development, a beginners' guide to the Internet, etc. The focus of this project is not on the basic skill development but on the development of ICT pedagogy integration skills of educators by sharing successful cases and practical ideas. UNICEF's Teachers Talking about learning also illustrates the application of this approach to ICT teacher training. It is designed for international collaboration between teachers in developing countries using the Internet and television. It provides access to teacher training materials and useful links and promotes discussions among teachers. All the cases discussed above use ICT as part of training methods and promote teachers' ICT-pedagogy integration in the classroom by demonstrating examples and allowing discussions among teachers throughout the whole training process. Participants of the training are asked to actually use ICT to learn about ICT skills and develop ICT-integrated pedagogies.

ICT as core technology for delivering teacher training:

In this approach, ICT is used as the major way of providing the learning experience of teacher training. The content of this approach does not necessarily focus on ICT skill itself but rather covers a variety of ICT applications. The digital technology is frequently becoming the core technology of ICT teacher training.

- Virtual High School It is the Internet-based ICT teacher training. VHS facilitates a collaborative of participating secondary schools.
- Teachers Learning Conference (TLC) course which trains teachers to develop and teach a Net-Course for VHS and a Net-Course Instructional Methodologies.
- NIM which trains teachers to teach an existing online VHS course.
- The TLC is designed to train teachers to become online course instructors and course developers whereas the NIM is designed to prepare classroom teachers to become online course instructors only.
- The TLC provides instruction on the pedagogy and methodology that each teacher will need to develop an effective Net-Course to be offered to the VHS students.

- A facilitator, VHS teacher, is assigned to each TLC participant to ensure that they have the correct resources to achieve training objectives. The focus the NIM is on content and curriculum, as well as good online course delivery.

ICT used to facilitate professional development and networking:

ICT, particularly Internet and Web-based communication technologies, being used to support teachers' on-going professional development and networking. Many countries have developed a website or websites to provide online resources for teachers and facilitate teachers' networking based on the assumption that professional development should be an integral part of daily practice for all teachers and 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.

Discussions and Conclusions

This analysis of approaches in ICT teacher training indicates that there are possibilities and challenges in adopting ICT in teacher training and professional development. Overall, governments and teacher training institutions seem to recognize the importance of integrating ICT in learning and teacher training. In addition, the Learn Link project in several developing countries is being implemented with close relationship with each country's government to integrate its activities into the nation's educational vision and policies. It is also observed in the analysis that a variety of ICT-integrated training environments have been created to provide more effective ICT training and teacher tends to integrate ICT in their teaching if they experience ICT skills as a learner. Teacher training approaches in this paper show that many cases adopt ICT into their training process not just as content of the training but rather as an integrated training environment and thus allow teachers to experience ICT-based pedagogies. Another possibility with the use of ICT in teacher training is that it connects teachers to a larger international teaching community. Several cases analyzed above operate the Internet-based teachers' learning community and support teachers to interact with peer teachers as well as teachers in other countries. Moreover, they invite experts to provide expertise to teachers through online forums or emails. Best practices in using ICT in teaching and learning and successful pedagogies are now being shared among teachers scattered around the world and make them more accountable towards teaching-learning process in changing global scenario.

References:

Ahmad Sajjad, (2009), Evolving a Framework for teaching and learning, Edutracks, vol8, no9 ,Pp11.

CEO Forum, (2001). Key Building Blocks for Student Achievement in the 21st Century: Assessment, Alignment, Accountability, Access, Analysis, School Technology and Readiness Report 2001, Washington.

Dash Manoj Kumar, (2007), Integration of ICT in Teaching Learning: A Challenge, Edutracks, vol6, no 12 ,Pp11.

Dellit Jillian, (2004) Using ICT for Quality in Teaching- Learning Evaluation Processes, South Australia Adelaide,

Jung Insung, (2005), ICT-Pedagogy Integration in Teacher Training: Application Cases Worldwide, Educational Technology and Communications, Division of Education, International Christian University, Osawa, Mitaka-shi, Tokyo.

Khvilon Evgueni,(2002), Information and communication in teacher education A planning guide, Division of Higher Education, UNESCO.

Pandey Saroj, (2002), Professionalization of teacher education in India : A critique of Teacher Education Curriculum reforms and its effectiveness, New Delhi Department of Teacher Education and Extension NCERT.

Sansanwal D N, (2009), Use of ICT In Teaching – Learning & Evaluation**,** Central Institute of Educational Technology, NCERT, New Delhi and State Institute of Education, Chandigarh

Umesh, (2007), Assuring Quality of Teacher Education in Present Scenario Edutracks, vol 6, no9 , Pp13.