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INTEGRATION OF ICT IN TEACHER EDUCATION

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ABSTRACT

Traditionally learning as hard, based on deficit model of students and process of transfer and reception was individualized and facilitated by division of content into small units and a linear process. But the introduction of ICT into teaching-learning process has changed the traditional concept. ICT defines learning as neutral, social, active, linearor nonlinear, integrate and contextualized, based on ability and strength of the student. Hence the use of ICT in Teacher Education can bring a rapid change in society.For this it is essential that teacher must have knowledge of basic ICT skills and competencies. It is for the teacher to determine how ICT can be used in the context of culture,needs and economic conditions. So there is a strong need of curriculum reform in the way that teacher training institutions i.e. primary or secondary need to develop strategies, plan to improve training programme and ensure that all pupil teachers are well prepared to use new tools in future to teach future of the nation i.e. students.

INTRODUCTION

The progress of any country depends upon the quality of education offered and its practices. Indian education was well known for its Gurukul system of education in the Vedic age. Education in India has undergone various phases and stages of development starting in the Vedic age to the post-independent period. At all stages of development there was a concern for bringing in quality education reflecting on the practical aspects in education.

The great Indian thinkers had emphasized on developing the inner potential of individuals by reflecting on unique potential of individuals. Getting educated is solely dependent upon the individual teacher's role to set conditions and generate environments for learning. The recent curriculum framework 2005 as proposed by NCERT (National Council of Educational Research and Training), India focuses on the following issues:

1. Connecting knowledge to life outside
2. Shifting from rote learning to constructing knowledge
3. Providing a wide range experiences for the overall development of a child
4. Bringing flexibility in the examinations

The recent developments in technology have changed the world outside the classroom; it is more eye-catching and interesting for a student then the classroom setting. As a result, students find classroom instructions as dull and devoid of life and do not interest them for learning. The information technology has made learner www afflicted. This is because technological developments have brought developments in two ways: First, by enhancing human capabilities by helping people to participate actively in social, economic, and political life in a society at large. Second, by giving advantage to technological innovation as a means for human development due to economic progress and increased productivity. The power of information is such that almost all decisions made in different sectors like science, technology, economics, and business development will be based on information that has been generated electronically. Information has become a key asset of the organization for its

progress. Therefore, access to information is a key factor in the generation of wealth and there is a strong link between a nation's level of development and its level of technological development. Educators and policymakers believe that information and communication technologies are of supreme importance to the future of education and, in turn, for the country at large. As ICT is becoming an integral element for educational reforms and innovations at secondary schools, this situation calls for an enhancement of pre-service education on ICT for prospective teachers.

There is a growing importance for ICT within the curriculum. Not only it is used to support teaching and learning within other curriculum subjects, but it is also a subject in its own right as a separate discipline. The major objective is that developing skills, knowledge, and understanding in the use of ICT prepares pupils to use such technologies in their everyday lives. ICT tools enable pupils to access, share, analyze, and present information gained from a variety of sources and in many different ways. The use of ICT provides opportunities for pupils to work both collaboratively and independently. As such, the role of ICT within the curriculum is not only to enhance the learning experiences of pupils but also to help them develop the skills essential to participate effectively in the world of affairs. It generates avenues for working in groups developing team spirit, cohesion, and social values. Concept of ICT can be best discussed in the form of a table given below:

Table 1

What, Why & How of ICT

Main Topic	Contents
What is ICT in general?	Information tools, productivity tools, communication tools, problem-solving and decision making tools
Why use ICT in education	Knowledge race, educational reforms, life long-learning
How to use ICT in classroom instruction	Presentation, practice, testing, inquiry, cooperative learning
How to use ICT for personal and professional developments	Distance learning, research, academic productivity
Safe and ethical use of ICT in education and in general	Content filtering, acceptable use policy fair use of e-resources in education, anti-virus

There is little doubt that today's prospective teachers will be expected to teach with technology in the classrooms of tomorrow. However, the resources available to teachers in terms of hardware, software, networking, and professional development vary greatly at different levels. Hence, it is imperative that teachers become directors of their own learning with regard to using information technologies in the classroom. Through learning to teach with technology, teacher preparation programs have a unique place at the beginning of this challenging process. The development of a pedagogically-based framework of constructs that are related to learning to use computers and an approach for its application in teacher preparation shows promise for meeting the following challenges:

First challenge for pre-service education is finding classrooms where pre-service teachers could observe teacher educators using technology appropriately and to understand where and how to include technology in their lessons. The computer has moved from an object to be studied to a teaching and learning tool for teachers and students. Hence, teacher preparation programs could no longer rely on an introductory course. We can't just bolt on the technology in teacher education curriculum; we need to take proactive steps for its integration in teaching learning. Teacher education and technological competence should involve all aspects of the preparation of teachers, i.e., introductory competencies, use of technology in

methods classes, school placements, and student teaching. Pre-service teachers need to develop a vision from the very beginning of their careers for using computers in their classrooms. For this, student teachers must understand computer operations and programming--leading them to develop a vision of the value and use of computers in learning. Therefore, it is crucial that teacher preparation programs should develop the cognitive, social, and physical environments that will help teachers feel efficacious and in control of learning to teach with technology, a domain that is often overwhelming even for experienced teachers.

Another challenge of preparing teachers to teach with technology is that as a result of knowledge generation, our knowledge about computer technology is constantly changing. In addition to this factor, there are various other dimensions like attitude, motivation, computer anxiety, and computer self-efficacy which play an important role in developing skills and competencies among prospective teachers.

The various skills and competencies to be developed on the part of student teachers would be:

1. Surfing the Internet and locating useful information from the Internet for the development of lesson plans.
2. Developing lessons plans incorporating student use of technology in the learning process.
3. Evaluating and selecting appropriate software for a particular subject and per student needs. e.g. SPSS
4. Generating printed documents like student assignments, newsletters, communication, etc. utilizing a variety of applications software like word processing and desktop publishing.
5. Managing student data; using data management tools for efficiently managing learning.
6. Using technology to gather, organize, and report information about student performance like Excel and Access for database management.
7. Developing tools to evaluate technology-based student projects including multi-media, word processing, database, spreadsheet, PowerPoint, desktop publishing, and Internet/telecommunications.
8. Using the Internet to support professional development including locating professional organizations, communicating with other teachers electronically, and participating in on-line professional development workshops and seminars.
9. Developing assignments and project work for students; giving them broader and deeper knowledge in a field of study; developing critical thinking and infusing creativity among students.

APPROACHES TO ICT INTEGRATION IN TEACHER EDUCATION

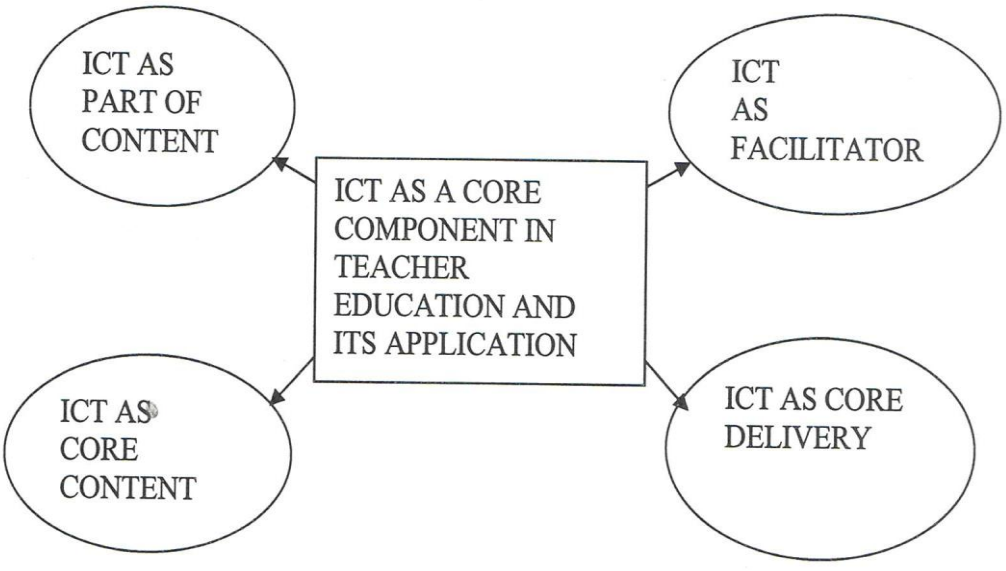
Use of ICT within teacher training programs around the world is being approached in a number of different ways with varying degrees of success. These approaches were subsequently described, refined and merged into following approaches:

1. **ICT Skills Development Approach:** Here importance is given to providing training in use of ICT in general. Student teachers are expected to be skilled users of ICT for their

daily activities. Knowledge about various software, hardware and their use in educational process is provided.

2. **ICT Pedagogy Approach:** Emphasis is on integrating ICT skills in a respective subject. Drawing on the principles of constructivism, pre-service teachers design lessons and activities that center on the use of ICT tools that will foster the attainment of learning outcomes. This approach is useful to the extent that the skills enhance ICT literacy skills and the underlying pedagogy allows students to further develop and maintain these skills in the context of designing classroom- based resources.
3. **Subject-Specific Approach:** Here ICT is embedded into one's own subject area. By this method, teachers/subject experts are not only exposing students to new and innovative ways of learning but are providing them with a practical understanding of what learning and teaching with ICT looks and feels like. In this way, ICT is not an 'add on' but an integral tool that is accessed by teachers and students across a wide range of the curricula.
4. **Practice Driven Approach:** Here emphasis is on providing exposure to the use of ICT in practical aspects of teacher training. Focus is on developing lessons and assignments. Using ICT and implementing it in their work experience at various levels provides students an opportunity to assess the facilities available at their school and effectively use their own skills.

Thus, ICT in teacher training can take many forms. Teachers can be trained to learn how to use ICT tools. ICT can be used as a core or a complementary means to the teacher training process (Collis & Jung, 2003). The various ways in which ICT teacher training efforts could be classified into four categories are shown the figure given below:



From the above suggested approaches, regarding ICT as a core component at the pre-service level, integration of all approaches would help in developing proper attributes among prospective teachers. There should be joint efforts of educators and prospective teachers in implementing and sharpening ICT skills. Whatever approach is followed in educational institutions to develop knowledge about ICT, it has inherent limitations. Coupled with other reasons, we are not making student teachers fully confident in using ICT in their daily classroom activities. As reported by Larose F. in their study, the level of computer literacy of the teaching staff is satisfactory but there is little transfer of these competencies to teaching

practices (Larose F., et al. 1999). Efforts are required on the part of teachers to make use of the available facilities for the best use in teaching /learning.

TEACHER EDUCATOR INITIATIVES

Whatever may be the inputs in the training and however well designed it is, the transformation can't be achieved without the leadership, commitment and initiatives of the teachers and teacher educators, both could take up initiatives like:

1. Self-learning using the tutorials available on the net, or print medium.
2. Hiring an ICT expert by a group of teachers/teacher educators.
3. Enrolling for online professionally development courses. There are many websites offering free training modules.
4. Enrolling for the best commercially available ICT training programs
5. Coaching by a colleague-Mentoring
6. Attending ICT training courses, seminars, conferences and workshops.
7. Communities of teachers' collaborative groups to integrate ICT into their
8. curriculum (same subjects, different subjects, same school/college, different school/college)
9. Online learning by means of videoconferencing, discussion forum, chat, blogging etc.
10. Visiting institutions where the ICT is already being integrated.
11. Action researches trying out various models of technology integration and publishing the result of the same.
12. Membership and active participation in national and international associations, whose primary concern is technology. The organizations like international society for technology in education (ISTE), All India Society for Electronics and Computer Technology (AISECT), Society for Educational Technology, Research and Development (SETRAD) etc. could be- considered.
13. Take up diploma or Certificate courses on ICT offered through distance mode by national or international universities and organizations. The University of Hull currently offers a course "M.Ed. In e-learning" through online mode (http://ces.hull.ac.uk/courses/ MEdineLearning.html)
14. Exploring the possibility of faculty exchange program to get placed in an organization where the ICT integration in already in place.
15. Taking up short-term or long-term projects related to ICT from ERIC, UGC, and ICSSR. This may be in collaboration with the schoolteachers
16. Keeping up-to-date with the latest developments in ICT through journals, magazines, newspapers and the internet,
17. Teacher educators modeling the ICT integration in their academic work.
18. Planning and implementing ICT in-service training programs for schoolteachers the best way to learn is to teach.
19. Creating a pool of ICT competent past teacher trainees and involving them in the training programs.

20. Designing and implementing self financing certificate course in ICT for in-service teachers.

The objective at the pre-service level is not to prepare technocrats, but to develop techno-pedagogues. Teachers should be in a position to integrate technology into teaching/learning as well as develop the art and skill of "webogogy" (i.e., to make use of Internet technology, exploring it, accessing information from it to use in teaching learning, etc.). So, objectives must be set at the attainment of application and skill levels rather than just at the knowledge and understanding levels. The professional development of teachers needs to be given importance. There must be congruence between the school curriculum and teacher training curriculum at the secondary level. Otherwise, teachers are not ready to utilize their knowledge to effectively design teaching/learning processes, project work, and assignments. In addition to offering ICT as a compulsory and special course, integrated approaches need to be studied along with methods courses. This will help student teachers to develop the concept of 'techno pedagogy' to a greater extent.

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