

Information and Communication Technology Based Teacher Education “A Global Perspective”

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Introduction

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. The recent developments in technology have changed the world outside the classroom; it is more eye-catching and interesting for a student than 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 Information and Communication Technology (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 school 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.

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

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assessments and institutional development. Today a verity 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.

ICT integration in institutions is being perceived as a necessity and is growing exponentially. The pervasive use of technology in all spheres of life, the knowledge economy and the paradigm shift together, generate demands on the institutions to adopt ways that help inculcate 21st century skills amongst 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:

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.

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.

Subject-specific approach

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.

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.⁷

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.

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

- Surfing the Internet and locating useful information from the Internet for the development of lesson plans.
- Developing lessons plans incorporating student use of technology in the learning process
- Evaluating and selecting appropriate software for a

- particular subject and per student needs
- Generating printed documents like student assignments, newsletters, communication, etc. utilizing a variety of applications software like word processing and desktop publishing
- Managing student data; using data management tools for efficiently managing learning
- Using technology to gather, organizes, and report information about student performance like Excel and Access for database management
- Developing tools to evaluate technology-based student projects including multi-media, word processing, database, spreadsheet, PowerPoint, desktop publishing, and Internet/telecommunication
- 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
- 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

Role of ICT in Curriculum

One can generally differentiate three distinctive roles for ICT in the curriculum

Learning about ICT

ICT as a subject of learning in the school curriculum, such as computer literacy, computer sciences and information literacy.

Learning with ICT

The use of various computer capabilities such as computation multimedia, internet or World Wide Web (WWW) as a medium to enhance instruction or as a replacement or other media without changing beliefs about the approach to and the methods of teaching and learning.

Learning through ICT

Here ICT is integrated so completely as essential tool in a course/curriculum that the teaching and learning of that course/curriculum is no longer possible without it.

As per the report published by UNESCO in 2003 the advanced countries including Australia, South Korea and Singapore have integrated ICT's into their educational system. Countries using ICT's but have not fully integrated ICT's in educational include China, Thailand, Japan, Malaysia, Philippines and India.

The best use of information communication technologies

in India has been i.e. Video conferencing facility which was introduced to import knowledge about the new technologies by UGC-CEC network with the help of ISRO and Doordarshan in the year 1994. CEC (Consorting for educational communication-an inter university centre of University Grants Commission) is responsible for maintaining the quality of e-content material on higher education. All the CEC material will be available on website through internet all over the world which can be accessed and used for educational purpose in most of the subjects taught in the country in two to three years time.

ICT Training Inputs for Teachers and Teacher-Educators

For the successful implementation of ICT, teacher trainees, teachers and teacher-educators need to be trained in the following dimensions. The commercially available training programs are designed to provide exposure only to system software, some of the application software and the basics of internet.

Awareness phase

The input should be to make the teachers aware of the importance and possibilities of ICT-the current trends and future projections.

Learning theories and technology integration

Traditional and modern view of learning, shift from teaching to learning, constructivism, role of ICT in lifelong learning.

Basic hardware skills

Hands on experiences in operating a) the PC and laptops-switching on, shutting down, and networking, b) storage devices- using floppy drive, CD ROM drive, flash drive, and burning CD-ROM, c) output devices-using printers and speakers, d) input devices-using keyboard (Including shortcuts), mouse, modem, scanners, web cam, digital camera, camcorders, date loggers and d) display devices-data projectors, and interactive white boards.

Understanding system software

Features of desktop, starting an application, resizing windows, organizing files (Creating, editing, saving and renaming), switching between programs, copying etc.

Using application/productivity software

Word processing, spreadsheet, database, presentation, publishing, creation of Portable Document Format (PDF) files, test generation, data logging, image processing etc.

Using multimedia

Exposure to multimedia CD ROMs in different subject,

installing programs, evaluating CD ROMs, approaches to using CD ROMs, creating multimedia presentations.

Using internet

e-mail, communities, forums, blogging, wiki: subscription to mailing lists, e-mail and internet projects, web searching strategies (navigating, searching, selecting, and saving information) videoconferencing, designing web pages, freeware and shareware, evaluating website resources, virtual fieldtrips, learning opportunities using the web, and netiquette.

Pedagogical application of ICT tools

Specific use of application software in different subject, appropriate ICT tools and pedagogy, unit plan integrating ICT tools, approaches to managing ICT-based learning groups, assessment of learning, electronic portfolio and assessment rubrics, creating each errand student support materials, supporting students with special needs.

Introduction to open source software

Concept, types, advantages, working on open sources application software.

Social, legal, ethical and health issues

Advantages and limitations of computer use, privacy violations, copyright infringement, plagiarism, computer security (hacking, virus, misuse, abuse and staying safe) healthy use (seating, light, sound, radiation, exercise)

ICT for professional and personal productivity

ICT for administration, record keeping, reporting and transfer of information, attendance, research, careers in computers and professional development opportunities.

As an advanced training website development, installation and use of server based applications, training in course management system, e learning course content development using various authoring tools; audio/video/image editing, animation etc. can be introduced. In addition to the hands on experiences every training program could include an ICT awareness /familiarity quiz, exhibitions of ICT books and multimedia CD ROMs by commercial agencies, poster session on success stories, case study presentations and analysis, ICT based demonstration lesson in the schools (whole class, small group, internet based, etc) exhibitions and presentations by commercial agencies on emerging technologies.

Conclusion

The most visible symbol of globalization has been the spectacular development of ICTs. ICTs are integrates in to

all aspect of life, Today and therefore, it is important for pre service teacher to fill confident and be competent in their use. They will use them as a resource for preparation and as a tool to gather knowledge and communication. Teacher is the architect of our future generation. The role of teacher society is both significant and valuable. Learning with computer and internet, in which technology facilities learning across the curriculum, integrating skills development with curriculum application.

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