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Innovative classroom practices with ICT

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Abstract
There is a paradigm shift in teaching-learning. Because ICT is instrumental in shifting the emphasis for learning environments from teacher-centered to learner-centered. Where teachers move from being the vital sourced information and transmitter of knowledge to students so, the role of students changes from passivity to activity. According to George Neller, "education must mirror the age it strives to improve it cannot isolate from automation any more than from other social or economic changes." There are three reasons for the increased importance of ICT. They are population expansion. 2) explosion of knowledge 3) changed the trend and attitudes of society.

Keywords: ICT, teaching-learning, pedagogy, teacher education

Introduction
There is a paradigm shift in teaching-learning. Because ICT is instrumental in shifting the emphasis for learning environments from teacher-centered to learner-centered. Where teachers move from being the vital sourced information and transmitter of knowledge to students so, the role of students changes from passivity to activity. According to George Neller, "education must mirror the age it strives to improve it cannot isolate from automation any more than from other social or economic changes." There are three reasons for the increased importance of ICT. They are population expansion2) explosion of knowledge3) changed the trend and attitudes of society.

Prerequisites of ICT Implementation In Teacher Education (Pre Service And Inservice)
Teacher education institutions of India are facing the challenge of preparing a new generation of teachers to use the latest learning tools in their teaching practices effectively. To achieve this, the pre-service and in-service teacher education has made drastic modifications in its entire approach towards preparing teachers. It is a well-known fact that all the knowledge accessibility has gone digital; hence, the teachers need to understand:

- The impact of technology on global society and the implications for education.
- The extensive generation of knowledge has been responsible for creating more useful and engaging in student-centered learning environments.
- The critical importance of the change process in planning for the integration of technology into teacher education.
- The ICT competencies required of teachers related to content, pedagogy, technical issues, social issues, collaboration, and networking.
- The importance of developing standards to guide implementation of ICTs in teacher education.
- Important strategies to consider in planning for the infusion of ICTs in teacher education and managing the change process.

Teachers and professionals sometimes consider ICT as being only a tool in the improvement of teaching and learning. ICT as a device should only be considered as an artifact in the new way of teaching. The teacher remains the prime mover in the teaching process.

- Based on these the prerequisites ICT implementation in teacher education is as follows: Sufficient access to digital technologies and the Internet in their classrooms, schools, and teacher education institutions.
- Availability of High quality, meaningful, and culturally responsive digital content
- Teachers must have the knowledge and skills to use the new digital tools and

Resources to help all students achieve high academic standards.

Why ICT in teacher education?

It is a usual argument from some of the professionals that India is yet to be ready for ICT implementations as we are still striving to fulfill our basic needs. This argument does have a strong justification because of two converging forces

- First, the quantity of information available in the world is exponentially more significant than that available only a few years ago, and the rate of its growth is accelerating.
- A synergistic effect occurs, and information gets doubled now and then.

A delay of one day may push us back to one year, and this process continues. Moreover, the traditional learning system emerged out of the factory model of education was adequate to the extent in preparing large numbers of individuals with skills needed for low-skilled positions in industry and agriculture. The innovation of classrooms was created along with the concept of standardized instruction for everyone. The traditional, teacher-centered approach to learning depicts that the teacher is the expert and the dispenser of knowledge to the students. It is mostly a 'broadcast' model of education where the teacher serves as the repository and transmitter of knowledge to the students. The traditional educational paradigm is often characterized that Learning is a hard, challenging, and often tedious process. According to this view, if students are having fun or enjoying a learning activity, they probably are not learning.

Need and importance of ICT

1. **Belief about economic:** practically all countries are expecting that economy education, future recreation and management will improve through the use of ICT
2. **Improving the social status of teacher:** by providing support better funding and infrastructure for teacher education at different levels of their operation.
3. **Willingness for Action:** There is a willingness to develop in-country policies for developing ICT in general and ICT competence in education both powerful and compulsive means are being used to involve people in the reforms in teacher education.
4. **The new approach of using ICT in teaching** Countries accepted that ICT could be used as
   (1) Teaching-learning tool
   (2) A resource
   (3) Field of study the subject.
5. **Broadened view about ICT in teacher education**
   (1) ICT is used as a recreation tool
   (2) Employment tool
   (3) Curriculum enrichment tool
   (4) Personality development tool.
6. **Introduction of ICT Program in teacher education curriculum**
   (1) Introducing general awareness
   (2) One optional/compulsory
   (3) One full paper of ICT in teacher training.
7. **On-line and off-line networks:** For the professional development of teacher and through on-line/off-line system needs immediate attention, need a more innovative program for the professional development of the teacher.

ICT for Curriculum Reforms

- Technology resources and pedagogical innovations can become contexts for curriculum reforms in teacher education. Framework and Culture identify the culture and other contextual factors that must be considered in infusing technology into the teacher education curriculum. It includes the use of technology in culturally appropriate ways and the development of respect for multiple cultures and contexts, which need to be taught and modeled by teachers.
- Leadership and Vision are essential for the successful planning and integration of technology into teacher education and require both guidance and support from the administration of the teacher education institution.
- Lifelong Learning acknowledges that learning does not stop after school. In common with the other themes, it is essential that teachers and teacher preparation faculty model lifelong learning as a crucial part of the implementation, and as an ongoing commitment to ICTs in teacher education.
- Planning and Management of Change is the final theme, born of today's context and accelerated by technology itself. It signifies the importance of careful planning and effective management of the change process.

ICT is used in teacher education for many reasons. At one level, the teacher education institutions wish to ensure that newly qualified teachers have the appropriate ICT skills. It may be that in the long term, there will be less need for this ICT skills development, as students will develop better ICT skills before they reach teacher education. The second dimension to ICT in teacher education is the development of students' capacity to make appropriate use of ICT in their teaching. This is more challenging, as student-teachers sometimes tend to use the most prominent applications of ICT, resulting in over-use of these ideas. In most of the teacher education institutions, developing ICT capacity among student-teachers is the responsibility assigned to the ICT specialist. This is an effective way to develop skills, but its utility for educational purposes needs to be emphasized. To achieve a wider spread of ICT usage within teacher education, the staff development programmes can make use of the services of system analysts as well the pedagogical scientists. The third dimension to ICT in teacher education is the use of a virtual learning environment to provide support to student teachers. This is both useful support to the student-teachers and an opportunity for them to develop the experience of a virtual learning environment. Student-teachers should gain experience of the same virtual learning environment as it is intended for school use, but this may present difficulties as the teacher education institutions are funded through different agencies and may have adopted various technologies.

Developing Effective ICT Integration in Teacher Education

The integration of ICT in the teacher is the need of the day. It is necessary to create suitable strategies in this integration.

- Technology should be infused holistically into the entire teacher education programme.

- Throughout their teacher education experience, students should learn about and with technology and how to incorporate it into their own teaching. It should not be restricted to a subject of theory or few practical's. Pre-service teacher education students should learn about a wide range of educational technologies across their professional preparation, from introductory and foundations courses to internship and enhancing professional capacities.

- **Contextual usage of ICT**
  There should be emphasis on professional ICT literacy without confining to theoretical literacy. Professional literacy is best learned in context. Pre-service students should learn many uses of technology in their course work and integrate into internship/field experiences. They should use it in their own learning, and they should explore creative uses of ICT in their teaching. Teacher educators and mentor teachers should expose pre-service teachers to extensive usage of technology and provide opportunities for them to teach with ICT in classrooms.
- **Students should experience ICT supported learning environments in their teacher education programme**
  ICT can be used to support traditional forms of learning as well as to transform learning. Such as using a PowerPoint presentation, can supplement the traditional lecture, but it does not necessarily transform the learning experience. On the other hand, using multimedia cases to teach topics that have previously been addressed through lectures may well be an example of a learning experience transformed by technology. Hence, Students should experience both types of uses of technology in their programme. The innovations in the web based technology has opened up an entirely new world of knowledge before the teachers which can be effectively used for the teacher education.
- This can be done by setting these goals
- To train every teacher-educator in the purposeful use of ICT for teaching and in turn emphasize it on their student-teachers.
- To equip teacher-educators with core skills in teaching with ICT, and develop suitable training models of ICT integration.
- To involve institutions of higher education and industry partners in teacher education programs.
- Strategies for Implementing ICT in Teacher Education.
- Providing a short foundation course that focuses on hands-on ICT experience as the initial stage of pre-service training. (Such a course should concentrate on applying ICT skills to achieve pedagogical objectives, rather than teaching IT skills in isolation.)
- Providing more advanced ICT courses as electives for students who need or want to develop more advanced IT-based pedagogical skills.
- They are integrating ICT components into all of the subject matter areas such Pedagogy of school subjects such as maths, social studies, and languages and so on, so that students have a role model for ICT-integrated teaching and learning.
- Designing ICT-integrated courses in such a way that students have the opportunity to produce ICT-based instructional materials themselves and share outcomes of the course with others.

Implementing Process of ICT in Teacher Education

The significant agencies of implementation of ICT in teacher education are

(a) Curriculum designers: The role of curriculum designer is essential in the ICT implementation in teacher education. The designing should enable the utilization of web resources, Internet communication, and online resources.

(b) Teacher Educators: The traditional role of the teacher educators can play a significant role in better implementation of ICT in teacher education. From a technological point of view, teacher Educators may be subdivided into at least three categories:

- Those having generally positive attitudes towards ICT-usage, encourage their students to acquire computer literacy, thus raising the standard of teaching and learning in the whole system
- Those who are neutral towards the use of ICTs in education
- Those with explicitly negative attitudes towards all new technologies.
- Hence the role of teacher educators having a positive attitude toward ICT is dominant in building an ICT enabled environment in the process

(c) Technologists: Technologists may be defined as follows

- ICT-experienced colleagues in teacher education
- Professors of ICTs, highly competent, but slightly less orientated to Technology-related pedagogical perspectives
- Technical ICT experts and computer 'gurus,' having no educational background
- Practicing teachers qualified in ICTs
- Student teachers competent in ICTs

Research Findings of ICT Use in Teacher Education

Important findings include

1. Use of ICT demonstrated a significant positive effect on achievement on all the notable subjects in preschool through higher education regular and particular needs of students.
2. Shreds of evidence show that interactive video was especially useful when the skills and concept to be learned.
3. It was found that a positive effect on student's attitudes towards learning and development of self-concept.
4. Grouping of students to the level of their knowledge in using technology.
5. Students who have experience of ICT show higher self-esteem and achievement.
6. The learning environment is controlled by the student's co-operative learning, which intern stimulate increased teacher –taught Interaction.
7. Students are most active in online interaction.

Effective Use of ICT /Guiding Principles

UNESCO document has given a broad framework for designing teacher education program that will care context and contents. Four themes of the curriculum are (1) background and culture, (2) leadership and vision, (3) lifelong learning, (4) planning and management of change. Four competencies and curriculum (1) pedagogy (2) collaboration and networking (3) social issues (4) technical issues

Challenge and reality curriculum: follow a curriculum which will be based on problem approach to laboratory approach.

Educational Goals and Vision of Learning through ICT

Before applying ICT in colleges of teacher education, there is a need for specified goals and vision. A vision of NCTE2015 curriculum framework is ICT along three broader strands1) teaching-learning 2) administrative and academic supported systems 3) broader implication for society. According to primacy to the role of teacher, enhancement of the expertise and engagement teacher should see that ICT is an important curricular resource and a important part of education, taking critical perspective on ICTs as well as promoting constructivist approaches that privilege participation and co-operation over mere access, are principles that the course will help teachers to explore. Applying these principles that support teacher professional development models that are self-directed need-based, decentralized, collaborative in line with NCFTE 2009 vision for teacher education.

ICT's are technologies along with developing such understanding the course will help student teacher to learn integrating technology tools for teaching and learning material development, developing a collaborative network for sharing and learning. This will address traditional challenges of teacher education and the need for adequate and appropriate learning material. Communication and information sharing are two social processes. New ICTs making these more accessible and cheaper have significantly impacted our socio-cultural, political, economic sphere.

The course will help student-teacher to develop an understanding of the shift from an industrial society to post-industrial formation society, where both production and consumption of information is both more facile/simple as well as essential.

This has positive and negative implications and possibilities for democracy, equity, and social justice, all core components of educational aims. ICT course will help student-teacher reflect critically and act responsibly to prevent how ICTs are used to support centralization and prioritisation of larger structures; it will show student-teachers ICTs can be adopted to support decentralized structures and processes, as well as build the 'digital public' to make education a participatory and emancipator process (Benkler, 2006) [28] here 20 skills teacher has to develop. They are as follows

1. Word processing skills
2. Spreadsheet skill
3. Database skill
4. Electronic presentation
5. Web navigation
6. Web site design
7. The ability to use the digital camera
8. E-mail management
9. Computer Network knowledge applicable to a teacher education system
10. File management &windows explorer skills
11. Downloading software from the web (experience including eBooks
12. Installing computer software onto a computer system
13. Web ICT or blackboard teaching skills
14. Video conferencing skills
15. Computer-related storage devices
16. Scanner knowledge
17. Knowledge of PDAs
18. Deep web knowledge
19. Educational copyright knowledge
20. Computer security knowledge

The teacher cannot be expected to learn these technical skills in teaching after an on-line approach. New technology and new resources and changed assessment practices are inevitable for the teacher in the present era of technology.

Rescheduling of college time table

It is important to build time into daily schedule allowing teachers to collaborate and to work with their students. As the college continue to acquire new technology for student and teacher can find more time to incorporate the changes.

Technical support and infrastructure

Increased use of ICT required a robust technical infrastructure and adequate technical support. Management has a responsibility to create not only nominal access to computer and network. There must be sizeable infrastructural facility is necessary and need of the hour.

On-going evaluation

On-going evaluation is necessary to find out the appropriateness of technology or in line with aims and objectives. Such assessment will bring change if learning goals are not met. Administrators can acknowledge and recognize incremental improvements in student outcomes as well as in changes teachers' curricula and practices. Gradual progress, rather than sudden transformation, is more likely to result in long-term change.

Conclusion

The changing expectations of society and the changing demands of the global market has enhanced the importance of educating the children to meet these demands. Every country, including India needs a productive citizen who can help the country to progress and compete with the international community. Hence the teachers should be well equipped to prepare the children for this ever-growing knowledge society. The age-old strategies of teaching-learning may not be suitable to meet these needs. The information overflow and techniques of accessibility are to be met effectively. Hence ICT should be considered not just a discipline of study but as a tool to access, create, and contribute information for this information society. It is through updating teacher education one can produce productive citizens to this country.

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