ICT EMPOWERED TEACHER EDUCATION IN TODAY'S ERA

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Abstract

Teacher education is an amalgamation of teaching skills, diverse learning styles, curriculum, teachers, educators, students, and infrastructure. Information and Communication Technologies, which have taken a central role in the past few decades, can contribute towards enhancing teaching abilities and learning quality in teacher education. Utilizing ICT in educational settings, however challenging it may be, can accelerate the learning outcomes as it provides proactive learning techniques with an all-inclusive environment. It provides varied opportunities and methods to boost the process of gaining knowledge in a holistic manner. Hence, this paper focuses on integration of ICT in teacher education. In today's digital age, it is a pre-requisite to incorporate strategies of modern ICT in educational programs to make teaching-learning effective. In the recent past, there has been a rapid growth of ICT in education where it has become a focal point of research for scholars.

Keywords

Student Teachers, Teacher Educators, Teacher education, Modern ICTs, Information, Communication and Technologies.

Introduction

Student teachers are being greatly influenced by their teacher educators. Barron & Goldman, revealed that "Educational reformers have long noted that teachers teach as they were taught". If we want to encourage the use of technology as a tool for learning and problem solving, it could be possible only when teachers would be able to incorporate ICT for students at all levels and in all appropriate contexts" (ISTE, 1999, p. 23). It is possible to produce future generation teachers who can effectively use modern ICTs for learning but this will be possible only when teacher educators play role models for their students in effective use of technology in their own classes (UNESCO, 2002). Also Bitter and Pierson in 2005 stated that, "technology literacy is a given order in our society" (p.29). In the Fourteenth Meeting of the Commonwealth Educational Media Centre for Asia (CEMCA) held on 16th September, 2014 at Penang, Malaysia, Dr. Sanjaya Mishra, Director, CEMCA, New Delhi presented the Annual Report for the year 2013-14 and presented a plan for 2014-15. He noted the various range of activities and the progress achieved in CEMCA's initiatives like Open Schooling, Teacher Education, Higher Education, Technical and Vocational Skill Development, Community Media. In the field of teacher education he noted that CEMCA will promote teacher ICT integration in blended learning. ICT training for teacher education is a niche area, where not many institutions are working. CEMCA would conduct capacity building for teacher educators for the state of Maharashtra/Madhya Pradesh. Adoption of Blended Approach and ICT Integration in Continuous Professional Development of Teacher Educators was focused in this meeting in which teacher educators have to be engaged with students in India over the three years of period 2012-2015. Also according to Steketee (2006),"For the sustained implementation of ICTs in schools, pupil teachers must be exposed to effective use of ICTs during their training period".

By integrating ICTs in teacher education programs, teachers can use innovative ways of learning for the students. It is acceptable that teacher education is the only recurring solution to integrate ICTs in classroom environments (Burkholder, 1995; Shermis, 1990; Kearsley & Lynch, 1994; Stoddart & Niederhauser, 1993, as cited in Java, 2004). U.S. Department of Labor, 1999, Tinio, 2002 cited that the creation of a global economy is as – "powered by technology, fueled by information and driven by knowledge". Therefore, all teachers must be competent and confident in using tools of ICT and building trust in the technology. Unless instructors (teachers) don't integrate ICT with their competency and mastery skills, ICT cannot be used for effective instructional delivery. In this regard, the teacher training aims at either teacher education through ICTs or teacher education in ICTs. There must be an instructor's (teacher's) professional development to change the whole educational process.

ICTs and Teacher Education:

Meaning of Teacher Education is that the procedures, policies, and provisions designed to equip pupil teachers with the behaviors, knowledge, attitudes and skills they need to perform their tasks in an effective manner within the classroom. Teacher educators are those professionals who are engaged in the activity of training future teachers. The Education Commission (1964-66) stated that "a sound program of professional education of teachers is essential for the qualitative improvement of education". Qualitative improvement is possible only when ICTs are integrated with it and it is the demand of the time also.

Teacher training can be of three types:

1. Pre-service training: - It is provided before entering actual classroom teaching.
2. Induction: It is provided during the first few years of service.
3. Continuing Professional Development (CPD): It is provided to the in-service teachers while exercising to enhance the capabilities through new technologies. The practicing teachers need to update them and learn to teach through modern digital technologies, because many of them have not been taught through modern ICTs technologies.

All the three teacher training types require the integration of ICTs for effective learning and teaching. Teacher education curriculum also needs to be updated because of changes in school curriculum. That's why ICTs integration in teacher education is needed.

Modern ICTs and Teacher Education

Technology has transformed the communities completely, the way people think, they work and also changed their life styles. New Education Policy has also focused on using technology in education. The policy intends to build out an exclusive unit for the purpose of development of digital infrastructure, digital content and capacity building to manage e-education at all levels. For this, teachers need to be trained in using ICTs to facilitate the learning process and make the process effective, challenging, achievable and exciting. All higher education students and pupil teachers can also do self- learning with the help of new ICTs just as they do independent study. Gbenga (2006) and Organization for Economic Co-operation and Development (2005) stated the advantages of ICTs are as follows:

- It is used to equip students with skills and training which they need in their future career.
- It helps teachers in lesson planning, delivery of content and students' assessment
- It facilitates to access information and communication inside and outside the classroom through the internet.
- It helps in professional development of teachers as well as students during and after training.
- It gives potential to the learning and teaching process. Teaching learning process can be made highly efficient and effective with the help of new teaching technologies. Both teacher and student carry out the process of teaching learning with great amount of creativity and interest by using new teaching technology.
- Teachers sprinkle considerable impact on their students and definitely it seems at all levels, may it be teacher education. There are some educational aspects of using modern ICT in teacher education, which can support the effective teaching-learning process in any condition. New pedagogical methods can be supported with help of modern ICT.
- Remote resources can be accessed.
- Enabling collaborations.
- Educational programs can be extended and skills can be developed in the workplace.
- There are some modern ICT tools available which are used in providing education in almost all fields. These are the synchronous ICT Tools namely Audio conferencing, Video conferencing, Skype, Google Hangout, Messengers etc.
- There are some modern ICTs strategies also which are used frequently like multimedia and flipped learning approach to enhance the teaching-learning process efficiently. Students take much interest in the subject when they are taught through these strategies.

Teaching-Learning through Technology Mediated Approaches

The learning and teaching approaches have changed from the past dramatically due to implementation of ICT effectively and its integration with the learning-teaching process (Takwale, et al., 2014). It is expected that the teacher plays the role of a moderator, instructor and facilitator in a technology-mediated learning environment in different situations. Therefore, there is an urgent requirement to reform teacher training programs to enhance new competencies and capabilities in usage of modern ICTs. Preece (2006) revealed that both teachers and students must have to learn and construct the belief on modern teaching technologies for performing technologically and likewise for enhancing diffusion of technology in teacher education and minimizing hindrance of technology. ICTs cannot be integrated into teacher education programs effectively until teacher educators may not attain mastery and competence in using new teaching technologies appropriate to the needs of the pupil teacher. Kozma and Anderson (2002) also claimed that ICTs are changing classrooms, schools and institutions and are giving more opportunities to students and teachers. Olaofe, (2005) stated that ICTs development is a required global resolution being a subject of great importance to all human beings. Hepp et al. (2004) stated that ICTs also play an important role in the educational system which can be social, cultural, pedagogical,

professional and administrative. In addition, new ICTs have the potential to prepare 21st century students. New ICT skills make students ready for facing challenges of the future which are based on appropriate understanding (Grimus, 2000).

The basic technology-mediated approaches are:

1. **Learner Centered**:
   Technology-mediated approach explores the best in each student. New teaching ICTs like online live meetings, flipped learning etc. are learner centered because the learners are benefitted to maximum extent. Constructivist learning approaches are also learner centered. In these approaches, learning is a process in which learners construct meaning through experiences and through reflections of these experiences (Muganga, 2015; Tinio 2003). Also in the era of Covid-19 pandemic, students got the opportunity to construct knowledge with other students with the help of modern ICTs in a challenging, authentic and holistic way. Learners are motivated when they are directed to acquire learning goals of professional development like self-guidance and information accession (Marton & Säljö, 1976a; Zimmerman, 2000). Barr and Tagg, 1995; Tinio, (2003) stated that the teacher plays a role of facilitator and guide in process of learning and he engages the learners in this process in which he/she can develop understanding of complex concepts, attitudes and competencies for long time which is key to success in a modern workplace. Students' learning approaches and Students' self-regulated learning are two more research traditions dominant in student centered learning (Apiola & Tedre, 2013; Biggs, 1987; Lonka, Olkinuora & Mäkinen, 2004). All these efforts can be successful when teacher education institutions and programs running in them confluence with modern ICTs in teaching and learning.

2. **Learning Centered:**
   With the help of a teacher, learners learn by designing and preparing meaningful learning experiences. Learning is a natural, active and social process. Throughout the world, ICTs supply golden opportunities to students and teachers for collaborating with each other. Also these give modern tools for supporting this cooperative and collaborative environment in the classroom learning as well as online learning. Many researches have shown that learning outcomes found maximum when new ICTs are integrated with teaching and learning. Modern ICTs provide students many keys to acquire and process the information. Learners integrate these keys with their learning structures of existing knowledge. ICT presents powerful tools which are capable of transforming traditional teaching learning setup into learner centered, learning centered and interactive classroom environments. All teacher education institutions and all schools urgently need to hold new ICTs with appropriate setups.

3. **Inquisitiveness Promoted:**
   By developing the questioning ability, the teacher buoys up the learner for asking questions which leads to critical thinking in learners. All these can be made more improved by integrating new ICTs. When ICT supported education is implemented and designed properly, it can promote the inquisitiveness and accession of the skills and knowledge which will equip students for learning lifelong. When ICT is used properly, Internet technologies and computers provide new ways for teaching and learning. With the help of ICT, students promote inquisitiveness in them and teachers feel curiosity to find new ways of teaching and learning which make students capable of achieving maximum learning outcomes. All these would be possible only when teacher educator and pupil teacher will be capable of using ICTs and this will be possible only by improving teacher education programs and teacher education institutions.

4. **Innovation Centered:**
   Innovation, team spirit and creativity are promoted in the learner by the teacher. Again all these can be made more effective and efficient with the help of new ICTs. Thomas Kuhn introduced a new term "paradigm shift" stating that science revolutions become very important when new teaching learning problems cannot be solved by old theories and teaching methods. Therefore, traditional teaching learning methods and schools cannot produce future ably civilization. Many countries are trying and making efforts to change old teaching learning systems into ICT based system to enable students to compete globally and become successful and to change society. All these can be changed only when there will be change in teacher education programs i.e. ICT enabled teacher education and by innovations in teacher education programs.

5. **Cooperative behavior and collaborative learning:**
   Cooperative behavior and collaborative learning environments are developed and learning arises through discussion, interaction and debate which are termed as "learning for development". More and more students can connect from very far away distances and explore different ideas through new ICTs. "Collaborative learning" and "Inquiry based learning", are the phrases commonly used and focuses on the active role played in the learning process by the students (Froyd and Simpson, 2008). Modern ICTs provide a big platform of Cooperative and collaborative learning to both instructor and learner from every corner of the world through web online meetings and also through many other software systems.

6. **Developing of learning experience design (LX design):**
   It is the process of creating learning experiences which enable the learner to acquire the desired learning outcomes in a human centered and goal oriented way. The simplest way to design a learning experience is to start working backwards from the desired learning outcome. Learning experience design is ingrained in a combination of several design disciplines with the field of learning.

ICT-Equipped Teacher Education

In teacher education programs, integration of ICT-based applications with methods, contents and pedagogy become more powerful for meaningful and effective learning of students. Institutions having teacher education programs should equip the teacher educators with latest knowledge, pedagogy and technology to develop quality system of education and to produce future teachers for the society (Singh, 2014). There are some strategies which can make the teacher education program ICT-equipped and successful.

- Teacher educators must be updated on new digital technology.
- Institutions of teacher education must be equipped with new ICT resources for both teacher educator and pupil teacher.
- Professional abilities should be developed to integrate new ICTs in teacher education.
- Classrooms need to be well equipped with basic ICT infrastructural facilities like internet, computer and projector etc.

Suggestions for effective implementation of ICTs in teacher education

1. ICT provides an excellent facility for higher education especially for teacher education programs. If a teacher educator is capable of using new ICTs in teaching, pupil teachers will be capable of using these and he or she will further use these new teaching technologies in his or her teaching. By including the new teaching technologies in teacher education, the whole system of teaching learning will be enhanced.
2. Every Teacher should be well equipped with the knowledge of new technologies of ICTs. They should know about the use of new technologies.
3. Demand of today's era is that new teaching technologies should be included in the syllabus of teacher training programs. For this, course content and curriculum should be planned on the basis of implementation of ICTs and also supported by technology-mediated approaches.
4. Government and private institutions of all types of education should organize seminars, workshops and Faculty Development Programs etc. on new teaching technologies to make the teachers aware about these.
5. Pandemic situations may also possibly occur in the future like the present situation of corona virus. Therefore to comfortably handle these situations in teaching learning processes and to promote online teaching, there should be an urgent need to include all types of new teaching technologies in teacher education programs.
6. In teacher education institutions, there should be well-equipped ICT Labs with good internet facility, computer systems, satellite communication and all other required electronic media to supply the better quality of learning to pupil teachers in this modern world.
7. Our government should also take the initiatives to make the ICTs reachable to common people, poor and below poverty line by providing them ICT related devices such as laptops, smart phones and tablets etc. Central government and many state governments have started doing the same from Covid era and before.

Challenges in Implementation of ICT in Education

Though the ICT has changed the traditional way of teaching and learning yet there are some of challenges which should be a matter of concern. The risk situations which may occur due to the use of ICT in the classrooms, are many more and some of these can be identified with some difficulty. Some of the challenges are as follows:

(a) low computing skills
(b) Lack of ICT infrastructure
(c) Failure of implementation of the collaborative system
(d) Higher costs of hardware and software
(e) Failure of Internet service provider system or power supply system
(f) Lack of technological skills among teaching faculty
(g) Unavailability of devices among students

Conclusion

Chaudhary and Garg, (2005), revealed that it is our responsibility to empower children and make them capable to face the challenges of the future and it can be made possible through education and modern technology. This can be done only by improving teacher education with modern technologies. Teacher educator himself/herself must have to be capable of using the ICTs in his/her teaching, then only he/she can make his/her students capable of using ICTs so that they can use it in their future and facilitate their teaching. ICTs can be beneficial to students and teachers in communication with one another and group to group through networking and communication channels, by sharing learning spaces, learning resources and stimulation of cooperative and collaborative learning. It provides a technique to work together in new ways with virtualization. In spite of the many hazards, utilization of modern technology in teacher education and its effective integration in the learning and teaching processes have become unavoidable in today's era. Teacher education program offered by the present system of education must be upgraded by adopting technology-enhanced learning and effective management practices. The great challenge is to change the curriculum and process of teaching learning to make students capable in understanding this changing world efficiently. So the institutions of teacher education must offer well-managed and quality education to all students along with modern ICTs facilities. There is an urgent need to collaborate technology-mediated approaches of education with teacher education programs to enhance the education system in all aspects.

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