

Emerging Trends in ICT and its influence on digital competency of teachers in higher education

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Abstract

The quality of education delivered and its methods influence the country's prosperity. India's Gurukul system of instruction was well-known throughout the Vedic era. India's educational system has gone through various eras and phases of development, from the Vedic period to the post-independence period. Individuals inner potential is created via contemplating about their particular potential, according to famous Indian philosophers. Outside of the classroom, modern technological advancements have revolutionised the globe. As a consequence of information technology, students have been affected. This is due to two sorts of changes brought about by technological advancements: The first is through aiding people in actively engaging in social, economic, and political life in a broader society in order to improve human potential. Second, by emphasising technological innovation as a tool for human development as a consequence of increased productivity and economic wealth. Pedagogical adjustments and innovations are becoming increasingly significant as ICT becomes a more fundamental component of secondary school pedagogy. This situation needs a boost in pre-service ICT training for future teachers. The study of ICT integration at the pre-service level for both trainees and teacher-educators is the focus of this chapter in the present circumstances. We observed considerable differences in educational institution best practices and opportunities for growth in this research paper. The objective of this research is to create a model that describes the important features of utilising digital technology to enhance educational institutes and assists in recognising differences across schools, as well as best practices and issues. In this study we discovered substantial differences in best practices and opportunities for improvement across the schools and colleges. It was notably beneficial for those components that largely dealt with the responsibility of being a leader in educational field. The differences in several features across schools were due to school-level practices rather than socioeconomic status. To summarise, we feel that all components of the model should be analysed and improved in order to improve schools utilising digital technology.

Keywords: ICT, Technological revolution, transformation, innovation, education institutes

Introduction

The twenty-first century is a century of information and a century of thought, and it is an entrepreneurial society. The trademarks of this century include the expansion of knowledge, the communication revolution, technological development, the application of science to all parts of life and above all, growing societal ambitions. At the same time, the knowledge is globalcontemplative, analytical, integrative, visionary and synergic. As a result, it is imperative that our young generation have the necessary mindset. As a result, education and training must be prioritized, and since teachers play such a vital part in a child's education, they must be regularly taught and their minds updated while being pragmatic and practical. They must place a premium on lifelong learning, as well as learning for and through life. It is critical that they get ongoing training and retraining in order to fulfill their roles more effectively and meaningfully.

Integrating Information and Communications Technologies (ICT) into education is a must for today's teachers. Nonetheless, integrating technology into the teaching and learning process may not be as simple as it seems. It's not only a question of locating new materials and attempting to incorporate them into regular courses; it also entails encouraging students to utilise ICT equipment and Web 2.0 applications to co-construct their own learning. This distinguishes them from pupils from the previous millennium."The teacher's job must move from that of information supplier to that of catalyst, model, mentor, innovator, researcher, and collaborator with the learner throughout the learning process," according to Hayes.To do so, educators and administrators in the twenty-first century must embrace the multi-media culture around them and acknowledge that the world is no longer a print-centric one; they

must also appreciate the advantages of being media-literate. Instead of using computers as typewriters and calling it innovation, educators must alter established processes.

Enhancing Teaching through ICT

Teacher education is the result of several intertwined imperatives, government policies, professional agendas, institutions, and organisations; and teaching accrediting bodies' benchmarks. Thus, dialogue and innovation, policy and result, curriculum and pedagogy, relevance and usefulness are all intertwined aspects of Teacher Education programmes. From time to time, the UGC committees on teacher education and the NCTE have advised appropriate adjustments. On one hand, there is this, and on the other hand, there is the actual teacher preparation that is taking on. All of these organisations have most likely concentrated on addressing structural barriers to teacher education. But what is most sought is to alter the inner narrative of teacher education programmes; change is required in teacher educators' techniques, materials, approach, and abilities. One of the most serious flaws in the teacher education system is the complete disconnect between what teacher educators teach and what teachers actually do. This may be seen in a variety of ways. For example, although trainee teachers are theoretically trained to utilise current technology to increase classroom communication, the number of teacher education schools that employ modern communication medium may be counted on one hand. Similarly, strategies to improve the evaluation system are taught to pupil teachers, such as continuous comprehensive evaluation, internal assessment, and grading system, but we are unable to adopt these procedures and practices in teacher education, which would make pupil teacher evaluation more relevant, valid, and reliable. The information era has arrived on the planet. Educational technology has been given a significant emphasis in the endeavour to improve teacher education. Intranet/internet-enabled and technology-based education and training It is possible to establish a virtual teacher education centre. All of the essential skills and training may be supplied via various network modalities, but the reality is quite different; even today, our classroom operations are primarily dependent on 'chalk and talk.' Something has to be done about this. ICT literacy must be taught to all teachers. Intensive training in the use of current ICT technologies, including offline and online electronic resources like as CD-ROMS, multimedia, and the Internet, should be included in all pre-service and in-service teacher education programmes. In teacher education, ICT should include all accessible ICT tools such as teleconferencing and data transfer. One of the most compelling arguments for incorporating ICT into Teacher Education is that it puts learning in the hands of users.

Utilization of ICT in Education

Using ICT, major improvements in pre-service teacher education and in-service teacher professional development may be hastened. By breaking down classroom walls and linking teachers to colleagues, mentors, curriculum experts, and the global teacher community, ICT-based teaching-learning programmes may help teachers overcome their isolation. Using ICT in Teacher Education has an impact on teaching and learning. Electronic instructions are becoming more common. Students sketch reference materials while listening to lectures streamed from their homes, residence halls, or office. CT facilitates educational transactions between providers and users by keeping teacher-learners in touch via e-mail, chat sessions, and other means, encouraging active learning, sharing ideas, providing immediate feedback, encouraging paced learning, and allowing for effective learning pathway mapping. Teachers may use the material found on the Internet and in online databases to design or enhance lesson plans, share ideas, collect information, and locate free animation and simulation to spice up their teaching. The new ICT allows students to study at their own speed using a variety of tools such as online assignments, e-tutorial sessions, and computer-assisted continual evaluation of their progress. As a consequence, the teaching-learning industry has grown increasingly focused on outcomes.

In order for faculty to improve their ICT skills, they must first understand what good 21st-century learning looks like. Teaching and learning must adapt to suit the very different demands of this generation in the twenty-first century, which is packed with spectacular new difficulties as well as thrilling new opportunities and ways. A classroom in the twenty-first century uses project-based learning, the inquiry process, and Bloom's updated taxonomy; it engages in genuine assessment; it links to a worldwide audience; and, finally, it will use technology to engage learners in collaborative knowledge-building. Given that today's children are referred to be digital natives, while today's educators are referred to as digital immigrants, it is very plausible and even anticipated, that students will be more technologically skilled than their professors. This reality might cause teachers to be afraid of failing, and many of them may believe they are not given the support they need to develop these abilities in themselves or their students. Teachers and students must become fluent in all 21st century literacy's: multicultural, media, information, emotional, ecological, financial, and cyber literacy, since the mission of faculty is to equip students to navigate this new environment.

Literature Reviews

The success or failure of training programmes may be determined by how institutions assist teachers in developing these necessary abilities. The institution's general approach to the use of technology for teaching has a significant impact on faculty development practices. A robust strategic plan that prioritised the use of technology in the classroom. Significant investment in technology infrastructure. Assistance for faculty members who wanted to utilise technology for teaching in a variety of ways. Support for students via computer access, Internet accounts, and financial support. Support for faculty members who wanted to use technology for teaching in a variety of ways. Many organisations are attempting to assist schools and teachers in acquiring these 21st-century abilities. The National Education Technology Standards (NETS) for students, teachers, and administrators have been published by the International Society for Technology in Education (ISTE). This standard is utilised in a variety of nations all around the globe. Despite the many hurdles that educators face in improving their ICT skills, many teachers are succeeding, as shown by the following studies:

- Teachers in the UK's "Developing conceptual frameworks for creativity, ICT, and teacher education" research emphasised the benefits of ICT in terms of experimenting with a variety of ideas, collaborating, being creative, editing, and trialling, as well as the immediacy of their work outcomes. 2004 (Loveless, Burton, and Turvey)
- According to the "Outcomes for Teachers and Students in the ICT PD School Clusters Programme" in New Zealand, ICT PD improved teachers' competence in graphics (81%), spreadsheets (67%), databases (57%), and multimedia packages (72%) and the vast majority (86%) of teachers reported at least some element of positive change in their classroom practices as a result of integrated ICT (Hal, 2007)
- Teachers who have gotten training on how to incorporate ICT into the classroom are substantially more likely to be doing so (44 percent) than teachers who have not received such training (34 percent). (Evaluation and Accountability Directorate, Western Australian Department of Education and Training, 2006)
- The research "Which variables hinder or inspire teacher educators to utilise ICT innovatively?" was conducted in the Netherlands. Showed that teacher educators, who were classified as 'personal entrepreneurs,' generated opportunities to experiment with ICT applications, conducted research on the use of ICT in their teaching, commented on their results, and shared ideas with colleagues (Volman, 2005)
- In India, Intel's 'Teach to the Future' national project focused teacher training using ICT tools, as documented in the "ICT in Pre-Service Teacher Training" research, is an example of corporate assistance for teachers to use ICT in education (Prasad, 2005)
- A research was conducted in Australia to give a valid evaluation of teachers' ICT competence. According to the findings of this research, the most significant impediment to teachers gaining ICT skills was a lack of technical assistance and a lack of computers (Western Australia. Dept. of Education and Training. Evaluation and Accountability Directorate, 2006).
- In Cambodia, a project was carried out to educate teacher trainers on software and hardware. This research found that the most common impediment to ICT integration was a shortage of ICT equipment, namely PCs (Richardson, 2009).
- According to an ICT cluster project in New Zealand that analysed the outcomes for Teachers and Students in the Use of ICT, teachers have significant concerns about access to ICT equipment for students (38 percent), equipment reliability (36 percent), and a lack of time for themselves to become familiar with the range of ICTs (37 percent) 2007 (Hal).
- According to the Assessment of Nigerian Teacher Educators' ICT Training study, the training had little influence on classroom practices since so many teachers needed word and data processing abilities, and just 2% of those with prior ICT training were taught how to teach using computers. Almost half of the teachers had never used a computer before (Jegade, 2009).
- A study titled "Integrating ICT into Pre-Service Teacher Education: The Challenges of Change in a Turkish Faculty of Education" found a number of roadblocks, including access to ICT resources, insufficient training, a preference for other teaching methods, a lack of mentor teachers' support, and technical/organizational issues (Alev, 2009).
- According to a research titled "Singapore's pre-service teachers' thoughts on integrating (ICT) during practicum," more ICT assistance and modelling is needed throughout the teacher education programme, particularly during the teaching practicum, to encourage pre-service teachers (Choy, Wong and Gao, 2005).
- In India, the "Survey Report on Pre-service Teacher Training on ICT Use in Education in Asia and the Pacific" found that a significant urban-rural imbalance in infrastructure, instructional facilities, and human resources for the

use of ICT, as well as a lack of electricity and high costs of hardware, software, and other infrastructure facilities, were major obstacles to teachers' consistent integration of ICT (Prasad, 2005).

- According to the research "Teachers Facing ICT: The Case of Greece," even while teachers believe in ICT, they are hesitant to incorporate it into elementary schools (Kiridis, A., Drossos, V. & Tsakiridou, E., 2006).

The majority of teacher education institutes' curriculum give practical rather than theoretical parts more weight. Because ICT disciplines are more practical and application-oriented, more practical than theoretical input is required. This seems to be overlooked while creating and defining educational goals. These are some of the most fundamental issues with technology integration. These are significant roadblocks in integrating ICT into the teaching/learning process. The aims of introducing ICT at the pre-service level, as shown in this scenario, are to create only technical know-how and knowledge of numerous alternative technologies and software packages. Furthermore, since theoretical classes take up more time, less time is spent on practical sessions. The overall strategy for introducing ICT to pre-service teachers is not particularly serious. It is apparent that neither students nor teachers are receiving training on how to incorporate ICT into the curriculum or the teaching/learning process.

Effectiveness on ICT Training for Teachers

It is imperative that all stakeholders in the education sector, from foundation to post-graduate, collaborate with teacher education institutions to make pre-service teacher training contemporary and worldwide. While there is little evidence that teachers are being trained to teach using technology, some studies suggest that participating in educational technology activities during pre-service teacher training has benefits such as increasing graduating teachers' willingness to integrate it into their own classroom curricula, and developing professional knowledge of instructional media and technology. It support the formation of learning communities for the purpose of concentrated critical evaluation on classroom ICT practice, as well as an increase in the number of teachers who utilise technology for their own learning, collaboration, and research. Although the younger teachers are digital natives, they must have prior experience in the sector in order to comprehend how to apply their technological expertise to their vocation.

In truth, most teachers are not adequately equipped to utilise technology in their classrooms. The greatest method to prepare teachers for ICT-based instruction is to let them do it. Technology-supported learning experiences that encourage and allow the use of technology to enhance learning, assessment, and instructional practices should be provided by all institutions participating in educator preparation. To transform what and how they educate, teacher educators will need to rely on developments in learning science and technology. The same requirements that apply to teacher preparation also apply to continued professional development. Throughout their careers, professional learning should support and enhance educators' identities as sophisticated technology users, creative and collaborative problem solvers, and adaptable, socially aware experts. Innovating, problem-solving, creativity, continual improvement, research, diagnostic data utilisation, and adaptable and individualised ways to addressing students' different needs and skills are all required for effective teaching in the twenty-first century. As a consequence, the most successful teachers are those who have sophisticated knowledge, expertise, and abilities rather than those who are primarily content deliverers and classroom managers.

Teachers must not only learn how to utilise technology for personal use, such as research, collaboration, lesson planning, and administrative tasks, but they must also learn how to use technology in the classroom. Although there are few publications and studies on the subject, field service may help a new teacher learn how to utilise technology with their kids. The function of the 21st century teacher has evolved into that of a facilitator, assisting students in locating, comprehending, and using the tools necessary to acquire and produce new knowledge. It's evolving from a solitary task to a collaborative one including colleagues, students, and distant experts. The training must assist pupil-teachers in learning to interact, practice with new technology tools in the classroom, and have peer critiques and mentorship in order to be effective.

Teachers' Information and Communication Technologies (ICT) Competencies Standards were recently created by UNESCO (CST). This project stated that: Teachers must be prepared to empower students with the benefits that technology can bring, while also being aware of the need for leading faculty to develop those skills (competencies) required in making them comfortable with the incorporation of ICT in the educational process. Teachers in both real and virtual schools and classrooms must be prepared with technology resources and abilities, as well as be able to successfully teach subject matter information while combining technology ideas and skills. The UNESCO ICT-CST project is built on three approaches to ICT usage that should be seen as three progressive stages that faculty should do one at a time in order to get the necessary abilities to face the new millennium's teaching challenges:

- The approach to technological literacy;

- the approach to knowledge deepening; and
- the approach to knowledge production.

Because identifying the specific demands and qualities that each of these three methods necessitates in various nations would be difficult, if not impossible, the project framework is specified only in broad strokes. This enables each institution to implement the initiative in a manner that ensures its success. It's simple to adjust it to a certain situation and set of needs. In order to achieve so, the following six components of the educational system must be considered: Policy and vision, curriculum and assessment, pedagogy, ICT, teacher professional development and organisation and administration.

The three methods and six components previously described are combined to produce a matrix, in which each intersection of an approach and a component constitutes a module for teacher training in ICT concerns. If teaching in a technological environment is the way of the future, then all teachers must have opportunity to develop their ICT confidence and competency. The International Computer Driving License certification (used in over 148 countries and 41 languages, making it accessible to practically any educator) is one globally recognised ICT training option. Teachers will also need ongoing support and professional development to promote technological risk-taking in the classroom. Every educational institution must recognise the necessity of providing teachers with the necessary tools to assist them in meeting the new problems that they will encounter in their own classrooms. Teachers have a significant role in the effective adoption of ICT in the educational process, according to UNESCO. This implementation "will be dependent on teachers' ability to structure the learning environment in nontraditional ways, to merge new technology with new pedagogy, to create socially active classrooms that encourage cooperative interaction, collaborative learning, and group work," according to the report.

Peters (2003) goes beyond the requirement for faculty to be trained in ICT concerns and advises that educators address the pedagogical shifts that have resulted from the introduction of the knowledge society, which includes the use of ICT. The following competencies are required for people, teachers, and students to meet the challenges of the knowledge society:

- Media competence
- Competence in dealing productively with plurality
- Competence in dealing productively with change
- Competence in active, conscious, and responsible life planning
- Social competence (relationships with others)
- Communication competence
- Collaboration competence
- Information competence
- Knowledge management expertise

Conclusion

The goal of integrating ICT at the pre-service level is to develop techno-pedagogues rather than technocrats. Teachers should be able to integrate technology into their teaching and learning, as well as cultivate the art and skill of "webogy" (i.e., to make use of Internet technology, exploring it, accessing information from it to use in teaching learning, etc.). As a result, rather than focusing on information and comprehension, goals should be defined at the application and skill levels. It is critical that teachers' professional development be prioritised. At the secondary level, there must be alignment between the school curriculum and the teacher training curriculum. Otherwise, teachers will be unable to effectively design teaching/learning processes, project work, and assignments using their knowledge. Integrated approaches must be studied alongside methodologies courses, in addition to delivering ICT as an obligatory and particular course. This will assist pupil-teachers in further developing the concept of "techno pedagogy". As a result, managing change in teacher education is a difficult and time-consuming task that necessitates understanding, concern, caution, and reflection. Teachers' education planners and administrators must provide academic leadership in order to prepare reflective teachers who can effectively manage the educational system at various levels of education, including pre-primary, primary, elementary, secondary, and higher secondary. Only when there are comparable changes in the administration of teacher education programmes can effective transformation in schools be achieved.

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