

**ROLE OF DIGITAL TECHNOLOGY IN TEACHING-LEARNING  
PROCESS - A REVIEW**

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**ABSTRACT**

Society has undergone enormous changes as a result of digital technology. The paradigm shift in education necessitates that modern teachers take on the role of digital net workers, encouraging students to be change enablers through the use of smart tools. The real-time utilization of smart classrooms and magnetic induction-enabled boards can provide technology-powered knowledge exchange that can stay in students' minds for a long time, hence improving teaching and learning methodologies. In the digital era, the availability of current technology needs a continuous improvement in the performance of all players in knowledge exchange. Teacher educators must ensure that students are safe, that the environment is protected, and that management is sustainable. The current study focuses on the concerns and challenges surrounding the use of digital technology in teaching and learning, which can be a driving factor. A quantitative research approach was utilized to collect data from teacher educators in order to examine the teachers' perceptions on the problems they experience when employing digital tools in the classroom. Limited accessibility and network connection, limited technical assistance, lack of appropriate training, limited time, and lack of instructors' ability were reported to be important concerns and challenges in adopting digital tools in the survey of male and female teachers. The findings reveal that male teachers use digital tools at a far higher rate than female teachers. The findings of this study provide useful information and suggestions to people in charge of integrating new technology into teaching and learning

Key words: Digital technology, Learners, Teacher educator

## **INTRODUCTION**

The current study examines how the digital revolution and active use of technology in our modern culture generate new possibilities, dilemmas, and challenges for teacher education. Because of the high technology density in Indian society, the widespread use of technology by young people in their daily lives, and the difficulties faced by teacher education in integrating and exploiting technology for educational purposes, there is an urgent need to investigate this field further. This digital revolution is having a growing impact on teacher educators, and it has been underlined that in order to be certified as teachers in this new pedagogical landscape, teacher education students must obtain digital literacy. It has evolved into one of the most crucial fundamental skills for teachers of all courses.

Given this context, policymakers, researchers, teacher educators, and school administrators agree that the digital literacy field has to be investigated further in today's educational institutions. Despite this unanimity and good intentions, it is important to remember that prior initiatives to use information communication technology in teacher education were more rhetorically grounded than in actuality. Today, we see a disconnect between the new educational reform's digital literacy visions and the reality in teacher education institutions. Despite the fact that technology access at teacher education institutes is required, we nevertheless discover that teachers lack fundamental digital literacy and that there is too much low-speed Internet access in the classroom.

As a result, the focus of this study is on whether we are approaching a period of technological upheaval, and what opportunities, obstacles, and dilemmas will teacher educators and teachers confront when attempting to integrate new, Internet-based technology into educational activities. The current work examines teachers' perceptions on the problems they experience when using digital tools in the classroom. Data was collected from teacher educators in the state of using a quantitative research design. Limited accessibility and network connection, limited technical assistance, lack of appropriate training, limited time, and lack of teachers' ability were among the top

concerns and challenges identified in adopting digital technologies by the questionnaire provided to male and female instructors.

## **REVIEW OF LITERATURE**

In the article Jani & Tere (2015) "Digital India: A Need of Hours," Jani & Tere investigated universal digital literacy and approach ability for all digital resources for citizens by ensuring that providing a digital scaffold to participatory governance that ensures convenience, such as making all government credentials and papers available on the Cloud with portability, and making resources and services available in regional languages.

Coccoli, Guercio, Maresca, and Stanganelli (2014) published a study titled "Smarter universities: A vision for the fast changing digital era," in which they examine how the availability of newer and newer technology influences how relevant processes should be carried out in the current fast changing digital era, leading to the adoption of a variety of smart solutions to improve the quality of life and the performance of both teachers and students. The Digital Futures in Teacher Education (DeFT) study considered a variety of contextual elements as well as contemporary debates concerning the role of ICT in the curriculum and its a connection to digital literacy (Gruszczynska and Pountney 2012, 2013).

According to Burnett (2011), the expanding possibilities offered by new technologies, as well as the diversity of digital practices associated with them, have sparked much discussion about the widening gap between literacy provision in teacher education and the rapidly changing digital literacy in learners' lives. According to Burnett (2011), the expanding opportunities given by emerging technologies In his work "Digital Natives As Pre-Service Teachers: What Technology Preparation Is Required?" he asks, "What Technology Preparation Is Required?" Lie (2009) is a documentary that looks into the topic of lying. Pre-service teachers' technology proficiency is limited by the limited scope and depth of their technology activities, highlighting the need for systematic technology preparation to help them learn more advanced technologies, classroom technologies, and assistive technologies, and, more

importantly, to help them make the connections between technology and teaching and make the transition from digital-native students to digital-native teachers.

Krumsvik (2006) conducted a study titled "The digital challenges of school and teacher education in Norway: Some urgent questions and the search for answers," which examines whether we have learned from our mistakes and are now entering a period of upheaval in technology implementation, as well as what opportunities, challenges, and dilemmas teacher educators and teachers face in this new pedagogical terrain. Jukes and Dosaj (2006) developed a set of behavioural descriptors that they believe distinguish digital native learners from many of their professors. They suggest that digital immigrants prefer a gradual and controlled delivery of information, singular tasking (rather than multitasking), text over graphics, music and video, linear and sequential presentation, standardize testing, and delayed rewards. Students who are digital natives, on the other hand..

One of the effects of the digital world, according to Prensky (2001a, 2001b), is the way young people think and process information in comparison to previous generations. He claims that this younger generation is accustomed to rapid information reception and transmission, allowing them to multitask and process information in simultaneously. They favour pictures over text since they grew up with movies, DVDs, and video games. As demonstrated in computer games, they anticipate immediate gratification and regular incentives.

## **TEACHER EDUCATION IN INDIA**

We have a huge number of teachers in India, but we will need many more to provide the best training lessons for future generations. Teacher education is a vital part of providing children with a quality education. Teacher education is one technique to ensure that students learn to their full potential in the classroom. The quality and extent of a learner's achievement is generally known to be dependent on the teacher's skill and motivation. The goals of teacher education in India have been explored by several education commissioners and expert committees. Teacher education is defined by the National Council of Teacher Education as a programme of education, research, and

training for people who want to teach at all levels from pre-primary to higher education (National Council for Teacher Education (NCTE) (1998).

According to the Oxford lexicon of education, teacher education is defined as "all the formal and non-formal actions and experiences that contribute to qualifying a person to accept responsibilities as a member of the educational profession or to discharge his responsibilities more successfully."

Teachers sometimes find it difficult to cope with the increased intellectual challenges posed by the changed global and local context due to knowledge explosion and extremely rapid changing digital technology. As a result, individuals must acquire fresh expertise as well as trustworthy and true information. Teacher education in India benefits student teachers by giving them with relevant knowledge, an attitude to seize what is needed at the time, and the skills they need to perform well in the teaching profession. It provides a conceptual and theoretical foundation for student teachers to understand the complexities of their vocation (Kaur & Swarup, 2016)

### **DIGITAL TECHNOLOGY IN TEACHER EDUCATION**

The evolution of electronic media has had an impact on people from all areas of life. Educational institutions have viewed the use of computers and the internet to improve the quality of education by making learning more relevant to life as an ideal. The residents of the future, who are now our students, will live in the age of digital technology. Is it true that we are providing kids with a technology-based education? Is it possible that we are exposing kids to the usage of computers and the internet? Have we incorporated digital technology into the classroom? What efforts is the department doing in this direction? What is the government's position on digital technology?

It is vital to include digital technology in teacher education in order to meet society's expanding demands and to provide a set of ICT-based education. In a world where a child may access information with a single mouse click, a teacher must be prepared to use digital technology for their own professional growth. With the introduction of better teaching concepts, there is a fundamental paradigm shift in the broader education system.

Learners are encouraged to be more independent, and curricula are becoming more dynamic as a result of this technology. Teachers should use internet resources to supplement their curriculum and pedagogy knowledge. Rather than simply learning technical abilities, successful use of digital technology necessitates a shift in classroom practise. Teachers must get familiar with the various approaches and applications available in the use of digital technology to facilitate teaching and learning.

In the context of the employment of digital technology in education, there are a range of ways to teacher professional development. Professional development in the use of digital technologies in teaching and learning is ongoing. As the school curriculum and technologies evolve, teachers must keep their knowledge and abilities up to date. Learning is no longer a teacher-centered, static process; rather, it is a learner-centered, adaptable one. With the addition of digital technology, it has been seen that the classroom has evolved into an active participant's platform where knowledge is actually evolving. Thus, in order to construct dynamic approaches of human development, professionally powerful education is required. To be able to teach, teachers must have both knowledge and abilities.

### **NEED OF THE STUDY**

The classroom environment is evolving. There is a technological divide between societal growth and teacher instructional activities in the classroom. If we look at our culture, we can see how technology has transformed our civilization yet teaching and learning activities at the teacher level have remained largely unaffected by technology. Teacher educators learn from a variety of sources, which is why digital technology is so important in the educational industry. As a result, the current study is critical and important since it demonstrates the role of digital technology in teacher education.

The findings of this study will be useful to college administrators, policymakers, and teacher educators in understanding the impact of digital technology on teachers in using digital tools. These findings include: limited accessibility and network connection, limited technical support, lack of effective training, limited time,

and teachers' competency. Finally, the study's findings will serve as a reference point for other scholars interested in this field of study.

Many studies (Al-Alwani, 2005; Ghavifekr, Afshari, & Amla, 2012; Gomes,2005; Osborne & Hennessy,2003; Ozden,2007) have been undertaken to study the obstacles of technology integration in education. This study examines teachers' perceptions of digital technology tools in the classroom, as well as perceived hurdles to their utilization. As a result, the study's key goals are as follows:

To determine teacher educators' attitudes toward using digital technology in the classroom for teaching and learning.

To determine the challenges of using digital technology in the classroom for teaching and learning among teachers.

To determine the extent to which teacher educators employ digital technology tools in the classroom for teaching and learning.

## **RESEARCH DESIGN**

The data received from all of the respondents was collected and analyse using quantitative methods in this study. The researcher who addresses the research objectives of teacher educators' perceptions of the usage of digital technology tools in colleges.

## **INSTRUMENTATION & SAMPLING**

Respondents were given a tool developed by Simin Ghavifekr, Thanusha Kunjappan, Logeswary Ramaswamy, and Annreetha Anthony, which had seven sections and 114 items. The questionnaire used a 5-point Likert Scale, with 5 representing "often," 4 representing "frequently," 3 representing "sometimes," 2 representing "rarely," and 1 representing "never." The survey was handed out to the participants by hand. The following sections of the questionnaire were included:

(a) Personal Information, (b) Experience with Digital Technology for Teaching, (c) Digital Technology access for teaching, (d) Support for teachers for Digital Technology use, (e) Challenges of using Digital Technology tools in teaching and learning, (f) Teacher Educators' Digital Technology skills, and (g) Teacher Educators' opinion about the impact of Digital Technology use on students' learning outcomes.

### **DATA COLLECTION PROCEDURES**

The technique for collecting data by the researcher is defined as data collection. The questionnaire was administered at random to 130 teacher educators. They have one week to complete and return the questionnaire to the researcher. All of the participants volunteered for the study and picked their responses based on their personal experiences. Some questionnaires had missing information, which meant that they couldn't be used as a contribution to this study. Finally, the researchers employed 100 questionnaires to analyse the data.

### **DATA ANALYSIS PROCESS**

The information acquired from the respondents was compiled and analysed with the Statistical Packages for the Social Sciences (SPSS) version 21. Inferential analysis is part of the investigation. The mean and standard deviation were examined using descriptive analysis. The research findings were also analyzed using inferential statistics (t-test)

### **HYPOTHESIS TESTING**

There is no link between gender and the use of Digital Technology tools in the classroom to help teaching and learning.

There is a link between gender and the use of Digital Technology tools in the classroom to help teaching and learning.



	Levene's Test for Equality of Variances	t-test for Equality of Means							
	F	Sig.	t	df	Sig.(2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	Upper
Equal variances Assumed	.055	.815	.174	98	.862	.040	.229	-.415	.495
Equal variances not Assumed			.174	41.031	.863	.040	.230	-.424	.504

Gender	N	Mean	Std. Deviation	Std. Error Mean
Male	50	2.08	.997	.199
Female	50	2.04	.992	.115

The results show that the use of Digital Technology tools in teaching and learning in the classroom of the male (M=2.08, SD=.997) is higher than the use of Digital Technology tools in teaching and learning in the classroom of the female (M=2.04, SD=.992) is insignificant,  $t=.174$ ,  $d.f.=98$ ,  $p=.0005$ ; however, since the  $p>.05$ , the null hypothesis is rejected and the alternate hypothesis is accepted, and the means of the two groups are significant. As a result, the statistics provide adequate evidence to suggest that males use Digital Technology in the classroom for teaching and learning at a higher rate than females.

## CONCLUSION

The purpose of this survey is to find out how B.Ed. teacher educators feel about using Digital Technology tools in the classroom for teaching and learning. It also looks at the difficulties of employing Digital Technology tools in the classroom to help teaching and learning. According to the findings of the study, teacher educators have an average level of perceptions about implementing digital technology tools in teaching and learning in the classroom, a high level of challenges about using digital technology tools in teaching and learning in the classroom, and a low level of recognition of the effectiveness of the extent of digital technology. In the classroom, these tools can help in teaching and learning.

Teachers' beliefs about the function of digital technology as a teaching tool, the value of digital technology for student learning outcomes, and their own personal confidence and expertise have all shifted as a result of the introduction of digital technology in education (Prestridge,2007). Barriers to integrating digital technology into teaching and learning are being removed (Ertmer,2005). Extrinsic impediments to teaching include a lack of finances, time, access, and technical assistance. Teachers were still commenting on the challenges to integrating digital technology tools in teaching and learning at teacher education institutions, according to the findings of this study.

## REFERENCES

- Al-Alwani, A. (2005). Barriers to Integrating Information Technology in Saudi Arabia Education. Doctor al dissertation, the University of Kansas, Kansas.
- Burnett, C. (2011). Shifting and Multiple Spaces in Classrooms: An Argument for Investigating Learners' Boundary-Making around Digital Networked Texts. *Journal of Literacy & Technology*, 12(3).
- Coccoli, M., Guercio, A., Maresca, P., & Stanganelli, L. (2014). Smarter universities: A vision for the fast changing digital era. *Journal of Visual Languages & Computing*, 25(6), 1003-1011.
- Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration?. *Educational technology research and development*, 53(4), 25-39.
- Ghavifekr, S., Kunjappan, T., Ramasamy, L., & Anthony, A. (2016). Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perceptions. *Malaysian Online Journal of Educational Technology*, 4(2), 38-57.
- Ghavifekr, S., Afshari, M., & Amla, S. (2012). Management Strategies for E-Learning System as the Core Component of Systemic Change: A Qualitative Analysis. *Life Science Journal*, 9(3), 2190-2196.

- Gomes, C. (2005). Integration of ICT in science teaching: A study performed in Azores, Portugal. *Recent research developments in learning technologies*, 13(3), 63-71.
- Gruszczynska, A., Merchant, G., & Pountney, R. (2013). " Digital Futures in Teacher Education": Exploring Open Approaches towards Digital Literacy. *Electronic Journal of e-Learning*, 11(3), 193-206.
- Jani, J. (2015). Digital India: A Need of Hours. *International journal of advanced research in computer science and software engineering*, 5(8).
- Jukes, I., & Dosaj, A. (2005). Understanding Digital Kids (DKs): Teaching & learning in the new digital landscape. The Info Savvy Group.
- Kaur, M. P. (2016). Teachers Education in India: Inclusion of ICT in Teachers Education. *International Education and Research Journal*, 2(2).
- Krumsvik, R. (2006). ICT-initiated school development in lower secondary school (Doctoral dissertation, Ph. D. thesis. The University of Bergen, Bergen, Allkopi).
- Lei, J. (2009). Digital natives as pre-service teachers: What technology preparation is needed?. *Journal of Computing in Teacher Education*, 25(3), 87-97.
- National Council for Teacher Education (NCTE) (1998) NCTE Document New Delhi, Published by Member Secretary, NCTE.
- Osborne, J., & Hennessy, S. (2003). Literature Review in Science Education and the Role of ICT: Promise. Problems and Future Directions A Report for NESTA Futurelab <http://hal.archives-ouvertes.fr/docs/00/19/04/41/PDF/osborne-j-2003-r6.pdf>.
- Özden, M. (2007). Problems with science and technology education in Turkey. *Eurasia Journal of Mathematics, Science & Technology Education*, 3(2), 157-161.
- Prensky, M. (2001). Digital natives, digital immigrants part 1. *On the horizon*, 9(5),1-6.

Prensky, M., & Berry, B. D. (2001). Do they really think differently. *On the horizon*, 9(6), 1-9.

Prestridge, S. (2007). Engaging with the transforming possibilities of ICT. *Australian Educational Computing*, 22(2), 3-9.

Van den Beemt, A., Akkerman, S., & Simons, P. R. J. (2011). Patterns of interactive media use among contemporary youth. *Journal of Computer Assisted Learning*, 27(2), 103-118.