

Role of Digital Technology in Teaching-Learning Process

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Abstract: Digital technology has brought significant changes in the progression of society. The paradigm shift in education requires the modern teacher to play a role of digital networkers to bring creativity within students as change enablers by using smart tools. Real time use of smart classrooms and magnetic induction enabled board can generate technology powered knowledge exchange which can settled long in students' mind in the upliftment of teaching learning methodology. The availability of newer technology in digital era demands to improve the performances of all stakeholders of knowledge sharing in a seamless way. Teacher educator has to ensure safety, environment protection and sustainable management. The present paper highlights the issues and challenges related to digital use in teaching and learning which can be driving force in overcoming the obstacles and become successful technology users. To analyze the teachers' perception of the challenges faced in using digital tools in classrooms, a quantitative research design has been used to collect the data from the teacher educators from the state of Jharkhand. The questionnaire has been administered on male and female teachers from the key issues and challenges found to be significant in using the digital tools were: limited accessibility and network connection, limited technical support, lack of effective training, limited time and lack of teachers' competency. The result shows there is a significant difference in the use of digital tools by male teachers is higher than female teachers. The outcome of this research provides proper information and recommendation to those responsible for integrating the new technologies into the teaching and learning process. The result suggests that, growing up with technology, digital natives as B.Ed. teachers are savvy with basic and social-communication technologies. However, their technology proficiency is limited by both narrow scope and insufficient technology driven activities.

Keywords: Digital Technology, Learners, Teacher Educator

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I. INTRODUCTION

The present paper discusses about how digital revolution and active use of the technology creates new possibilities, dilemmas and challenges for teacher education in our contemporary society. In India there is an urgent need to explore this area more deeply because of the high technology density in society in general, the youngsters' massive use of technology in their everyday life and the difficulties experienced by teacher education in integrating and utilising the technology for educational purposes. Teacher educators are increasingly affected by this digital revolution and it is also highlighted that the teacher education students have to achieve digital literacy to be certified as teachers in this new pedagogical terrain. It has become one of the most important basic competencies for teachers in all subjects.

Given this background there is a consensus among policy-makers, researchers, teacher educators and school management that the digital literacy area needs to be explored more deeply in our contemporary educational institutions. However, despite this consensus and good intentions one has to bear in mind that earlier efforts with information communication technology implementation in teacher education have been more strongly anchored rhetorically than in practice. Today we find that there is a discrepancy between the digital literacy visions of the new educational reform and the reality in teacher education institutions. Even if technology access in teacher education institutions is being mandatory but, we still find that there is a lack of essential digital literacy among teachers and there is too much low-speed Internet access in the institutions, neither of which is taken into account in the reformers' ambitious visions for digital literacy (Lie, Beemt 2009; van den et. al., 2011). This illustrates the complexity of this area and, consequently, raises a number of questions. Does the new, converging, Internet-based technology create a fertile ground for this new, mandatory digital literacy in teacher education institutions? If so, what happens to the teacher's role, to students and to subjects when digital literacy becomes mandatory in all subjects?

Therefore, this paper focuses on whether if we are now entering a time of upheaval within technology implementation, and what kind of possibilities, challenges and dilemmas will teacher educators and teachers face when trying to integrate the new, Internet-based technology, in educational activities. The present paper analyzes the teachers' perception of the challenges faced in using digital tools in classroom, a quantitative research design has been used to collect the data from the teacher educators from the state of Jharkhand. The questionnaire has been administered on male and female teachers from the key issues and challenges found to be significant in using the digital tools were: limited accessibility and network connection, limited technical support, lack of effective training, limited time and lack of teachers' competency. The result shows there is a significant difference in the use of digital tools by male teachers is higher than female teachers. The outcome contributes to teacher education and provides recommendation to decrease the gap between this arena and the field of practice.

II. REVIEW OF LITERATURE

Jani & Tere(2015) has investigated the universal digital literacy and approachability for all digital resources for citizens by ensuring that the resources and services are accessible in regional languages and providing digital scaffold to participatory governance ensuring convenience, like making all government certificates and documents available on the Cloud with portability in the article Jani & Tere(2015) "Digital India: A need of Hours" .

Coccoli, Guercio, Maresca & Stanganelli (2014) has conducted a study on "Smarter universities: A vision for the fast changing digital era" which analyses how the availability of newer and newer technology reflects on how the relevant processes should be performed in the current fast changing digital era which leads to the adoption of a variety of smart solutions to enhance the quality of life and to improve the performances of both teachers and students. The Digital Futures in Teacher Education (DeFT) project has acknowledged the broad contextual factors which also addresses the current debates on the role of Information and Communications Technology (ICT) in the curriculum and its relationship to digital literacies (Gruszczynska and Pountney 2012, 2013).

Burnett (2011)evaluated that the increasing possibilities offered by new technologies and the diversity of digital practices associated with them with prompted much debate on around the growing gulf between literacy provision in teacher education and the rapidly changing digital literacies in learners' lives. Lie (2009) examines in the article "Digital Natives As Pre-service Teachers: What Technology Preparation Is Needed?" the proficiency of pre-service teachers limited by both the narrow scope and the lack of depth of their technology activities which highlights the need for systematic technology preparation is to help them learn more advanced technologies, classroom technologies, and assistive technologies, and more important, to help them make the connections between technology and teaching and to help them make the transition from digital-native students to digital-native teachers.

Krumsvik(2006)conducted a study on "The digital challenges of school and teacher education in Norway: Some urgent questions and the search for answers" which focuses on whether we now have learned from the past and are entering a time of upheaval within technology implementation and asks what kind of possibilities, challenges and dilemmas teacher educators and teachers face in this new pedagogical terrain. Jukes and Dosaj (2006) have created descriptions of behaviors that they feel differentiate digital native learners from many of their teachers. They argue that digital immigrant teachers prefer a slow and controlled release of information, singular tasking (as opposed to multi-tasking), text over pictures, sound and video, linear and sequential presentation, standardized testing, and delayed rewards. Digital native students, on the other hand, prefer multimedia, parallel processing and multitasking, pictures and video before text, immediate relevance, and instant gratification.

Prensky (2001a, 2001b) argues that one of the consequences of the digital environment is the way that young people think and process information compared to older generations. He argues that this younger generation is used to fast reception and transmission of information, allowing them to parallel process and multi-task. Being brought up on video, DVDs, and gaming, they prefer graphics before text. They expect instant gratification and frequent rewards, as can be seen in video games.

Teacher Education in India

We in India have a large number of teachers and we certainly require many more to suffice the best training lesson for the generations to come. Teacher Education is an important aspect of imparting genuine education to the students. Teacher Education is one way of ensuring that optimal learning takes place in the classrooms. It is very well known that the quality and extent of a learner's achievement are based on the teacher's competence and motivation. Various education commissions and a number of expert committee have discussed the aims of teacher education in India. The National Council of Teacher Education has defined teacher

education as – A program of education, research and training of person to teach from pre-primary to higher education level (National Council for Teacher Education (NCTE), (1998).

According to goods dictionary of education, Teacher Education means, “all the formal and non formal activities and experiences that help to qualify a person to assume responsibilities of a member of the educational profession or to discharge his responsibilities more effectively.”

Owing to knowledge explosion and tremendously fast changing digital technology, the teachers sometimes find it rather difficult to cope with the new intellectual challenges being thrown up by the changed global and local context. Therefore, they need to acquire new knowledge, and reliable and authentic information. Teacher education in India helps the student teacher by providing relevant knowledge, an attitude to grab what is necessary as per the present need and skills to functions effectively in the teaching profession. It equips a student teacher in both conceptual as well as theoretical framework in order to make them understand the professional intricacies(Kaur & Swarup, 2016).

Digital Technology in Teacher Education

The developments in the use of the electronic media have influenced all walks of life. Education is no exception to this. The use of computers and the internet for enhancing the quality of education by making learning more relevant to life has been seen as an ideal by educational institutions. The citizens of tomorrow who are our students now are going to live in the age of the digital technology. How are we preparing them for the same? Are we giving them technology based Education? Are we giving them exposure to the use of computers and the internet? Have we integrated the digital technology into classroom processes? What are the efforts made by the department in this direction? What does policy say about digital technology in Education? There are several such questions which we need to probe into. An understanding of these issues will enable us to use the digital technology more meaningfully in Education (Kaur & Swarup, 2016).

With the growing demands of society and on set of Information and Communication Technology based education, it is necessary to include digital technology in teacher education. With a scenario where information is accessible to a child at one mouse click, a teacher must be equipped with competence to use digital technology for their own professional development. There is a major paradigm shift in the overall education system with implementation of better teaching concepts.

This technology invites learners to be more independent and the curricula to be more dynamic. Teachers need to complement their content and pedagogy expertise by utilizing online facilities. Use of digital technology effectively requires a change in classroom practice rather than mere acquisition of technical skills. Teachers need to familiarize themselves with possibilities approaches and application in the use of digital technology, the facilitation of teaching learning.

There are a variety of approaches to professional development of teachers in the context of use of digital technology in education. Professional development to incorporate digital technology into teaching and learning is an ongoing process. Teachers need to update their knowledge and skills as the school curriculum and technologies change. No more learning is a teacher centric static process; it is more of learner centric and flexible process. Now with the inclusion of digital technology it is observed that Class Room has turned into an active participant's platform where actually the knowledge evolves. Thus professionally powerful teaching is the need of the hour in order to design dynamic ways of human development. Teachers need to acquire knowledge as well as skills to be able to survive and more than that to impart best of knowledge to the students(Kaur & Swarup, 2016).

Need of the study

The scenario of the classroom is changing. There is a technological gap between the progress of the society and instructional activities of the teacher in the classroom. If we see in our society on the one hand technology has revolutionized our society and on the other hand the teaching learning activities at teacher level have remained so far away from technology. Teacher educators learn from multi sources and for this reason use of digital technology is very much essential in educational field. So the present study has great need and significance because this study shows roles of digital technology for teachers' education.

The findings of this study shall also be useful to college administrators, policy makers and teacher educators in understanding the influence of digital technology on teachers in using the digital tools were: limited accessibility and network connection, limited technical support, lack of effective training, limited time and lack of teachers' competency. Finally, the findings of the study will act as a reference point to other interested scholars interested in this area of research.

Many studies have been conducted to investigate the challenges to technology integration in education (Al-Alwani, 2005; Ghavifekr, Afshari & Amla, 2012; Gomes,2005; Osborne & Hennessy,2003; Ozden,2007) . This study provides teachers' perception and perceived barriers to the use of digital technology tools in classroom's teaching and learning process. Therefore, the main objectives of this study are as follow:

- i. To identify teacher educators' perceptions in implementing digital technology tools in teaching and learning in classroom.
- ii. To determine the challenges of digital technology tools in teaching and learning in the classroom among B.Ed. Teachers.
- iii. To identify that to what extent do teacher educators use digital technology tools in teaching and learning in the classroom.

However, in this paper Digital Technology tools refers to the common technology-based tools that are using in B.Ed. colleges such as computer, Laptop, LCD, digital photocopy machine, digital Audio and Video devices, digital camera, scanner, DVD player and multimedia projector.

Research Design

In this research, quantitative methodology has been used to collect and analyze the data obtained from all the respondents. A questionnaire developed by Simin Ghavifekr, Thanusha Kunjappan, Logeswary Ramaswamy and Annreetha Anthony has been used by the researcher which addresses the research objectives with regard to teacher educators' perception on the use of Digital Technology tools in B.Ed. Colleges in Jharkhand state.

Instrumentation & Sampling

A tool developed by Simin Ghavifekr, Thanusha Kunjappan, Logeswary Ramaswamy and Annreetha Anthony consisting of 7 sections and 114 items was administered among respondents. The questionnaire has been based on 5-point Likert Scale ranging from: 5=always, 4=often, 3=sometimes, 2=rarely and 1=never. The survey has been distributed by hand to the respondents. The various sections of the questionnaire included: (a) Personal Details,(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,(g) Teacher Educators' opinion about Digital Technology use impact on students' learning outcome.

Data Collection Procedures

Data collection defines the procedure for collecting data by the researcher. The questionnaire has been distributed to 130 teacher educators randomly. They have been given one week to fill the questionnaire and return it to the researcher. All of the participants volunteered themselves in the research and chose their answers based on their perceptions.. Some questionnaires have been with missing information that details could not be used as a contribution in this research. Finally 100 questionnaires have been used by the researchers for data analysis.

Data Analysis Process

The data collected from the respondents have been gathered together to be analyzed using the Statistical Packages for the Social Sciences (SPSS) version 21. The analysis includes inferential analysis. The researchers used descriptive analysis to analyze the mean and standard deviation. Inferential statistics (t-test) has also used to analyze the research findings.

Hypothesis Testing

H0: There is no relationship between gender and the use of Digital Technology tools to support teaching and learning in the classroom.

H1: There is a relationship between gender and the use of Digital Technology tools to support teaching and learning in the classroom.

	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
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 result shows in independent t-test means, 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 learning of the female (M=2.04, SD=.992) is insignificant, $t=.174$, $d.f.=98$, $p=.0005$, however, since the $p < .05$ so the null hypothesis is rejected and alternate hypothesis is accepted, and the means of two groups are significantly different from each other. Thus, the data provide sufficient evidence to conclude that the use of Digital Technology in teaching and learning in the classroom by males are higher than among the females.

III. CONCLUSION

This study is more related to identifying the perceptions in implementing Digital Technology tools in teaching and learning in the classroom among B.Ed. teacher educators. Furthermore, it examines the challenges of using Digital Technology tools in supporting classroom teaching and learning in the classroom teaching and learning. Based on the study the findings indicate that average level of the perceptions in implementing digital technology tools in teaching and learning in the classroom among teacher educators, high level of challenges of using digital technology tools in teaching and learning in the classroom among teacher educators and recognizing the effectiveness of the extent of digital technology tools in supporting teaching and learning in the classroom.

With the advent of digital technology in education, teachers from their own belief about the role of digital technology as a teaching tool, the value of digital technology for student learning outcomes and their own personal confidence and competency (Prestridge, 2007). Barriers exist in integrating digital technology in teaching and learning (Ertmer, 2005). The barriers are extrinsic to the teacher and include lack of resources, time, access and technical support. Findings of this research suggest that teachers were still giving comment on the barriers in implementing digital technology tools at teacher education institution in teaching and learning.

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