

Exploring the Perceptions of K-12 Teachers towards Ed-Tech Tools

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Abstract

Technology has impacted nearly all facets of everyday life. Be it commerce or governance, technology is becoming an integral part of developing societies, and education is no exception to it. The necessity to include digital technologies in the educational system is growing due to their rapid development in contemporary practices. In the Indian context, the National Education Policy 2020 also emphasizes the importance of integrating technology at all levels of education. Further, it highlights facilitating teachers' preparation for technological integration. The present study aimed to explore the teachers' perceptions of technological integration in the teaching-learning process and awareness about emerging Ed-Tech tools. The sample consisted of N=50 in-service teachers of primary to higher secondary levels from government and private schools in eastern states of India. These teachers were under in-service training for the academic session 2022-23. The results showed that most educators are supportive of technology-integrated teaching and learning. Furthermore, more than half of teachers have received proper training related to the functioning and applications of different tools and technologies. The study also revealed that some teachers who have average technological skills also held positive attitudes towards technological integration in teaching and learning. It showed that some factors that interfere negatively, made many teachers skeptical about technology integration in educational practices. In this study, we have found that few teachers had never utilized technology in the classroom and were technologically inept. The present study can be a base for further research in order to explore why these teachers couldn't integrate technology into the teaching and learning process.

Keywords: Ed-Tech tools, technological proficiency, technological integration

Introduction

Technology has advanced significantly in the classroom since the 1980s. Today, technology is more than tools like interactive whiteboards, graphing calculators, laptop computers, iClickers and iPods. The pandemic has also added to the surge of different technologies amidst a slew of new challenges for education around the world. The question of how

technological integration started in educational systems can be traced back to when the term "digital natives" was first brought to light by Prensky in 2001. The digital natives are referred to as "the younger generations who grew up with technology-integrated lifestyles." Since then, several researchers have started focusing on technology-integrated learning environments (Lei, 2009; Rainie, 2006; Stearns, 2006; Wood, 2006). In order to integrate

technology in the classrooms, the role of teachers has been more emphasized. The prominent developments in the technologically integrated models for teaching and learning were made by several researchers over a certain period of time (Mishra & Koehler, 2006; Puentedura, 2006). The recent models which have gained attention are the Technological Pedagogical Content Knowledge (TPACK) and Substitution Augmentation Modification Redefinition (SAMR) models. In the Indian context, the Government of India's (2020) National Education Policy has recently highlighted the emerging need for technological integration at each level in the Indian education system. Further, it also has emphasized suitable training of teachers to enhance their technological skills. The policy also proposed to form the National Educational Technology Forum (NETF), for the free sharing of ideas among teachers and administrators. The present study was conducted in curiosity to understand whether the teachers in the present educational system are aware of recent trends, tools and policy recommendations. Further, if they are aware of whether they are effectively integrating technology in real classroom situations.

Objectives

- To study the perceptions of teachers towards technological integration.
- To study the teachers' perceptions about the different Ed-Tech tools in K-12 education.
- To identify the factors that affect the integration and utilization of the Ed-Tech tools in the teaching-learning process.

Review of related literature

Recently several studies have emphasized the need for technological

proficiency among teachers (Guillén-Gámez et al., 2020; Rodríguez-Segura & Schueler, 2022). Gorder (2018) reported that in the last few years, the primary focus of many teachers is on making students aware of technology, but they themselves are unfamiliar with the abilities of integration and active learning utilizing technology. The teachers' opinions can influence successful technological integration and are the major determinant of whether they will employ technology in the classroom in the future. Although many factors influence how successfully technology is integrated, the most important is teachers' competency and aptitude to adapt instructional technology-based activities according to the needs of the learners (Hong, 2021). The other factors include the degree of cooperation, self-assurance and teamwork (Mundy et al., 2019). It was evident from the previous studies that the teachers who use technology in the classrooms were able to enhance learning and also bring out active learning among the learners (Marshall, 2016). However, there is very little emphasis given to teachers' preparation for technological integration both in the pre-service and in-service phases. Zhao et al. (2021) in their study has emphasized that there is still more work to be done in terms of practice and training of the teachers. Porter and Graham (2016), in their study, have tried to highlight a few issues that have affected technological inclusion recently in the classroom. The key issues that were discussed are lack of resources, lack of training and insufficient time. To completely comprehend how instructors in the modern world view technology in teaching and learning, further research in this area is still needed. In order to learn more, we must critically evaluate, consider and synthesize the data underlying teachers' perceptions of how to integrate technology into the classroom.

Methodology

The present study has utilized a mixed methods approach to explore the teachers' perceptions towards Ed-Tech tools in teaching and learning. The sample consisted of 50 teachers from government and private schools from mostly eastern states in India. The purposive sampling was followed for this study. The tool used was a self-made questionnaire which was prepared and validated with the help of experts. The questionnaire was designed to check the teachers' awareness and knowledge of Ed-Tech tools and included both close-ended and open-ended questions. The close-ended questions were on a dichotomous scale. It also consisted of a checklist of different Ed-Tech tools from various categories i.e. game-based tools, online discussion forums, learning management software, online meeting software, social media-based software and MOOCs. The questionnaire was distributed or forwarded to the teachers and responses were collected with the help of Google Forms. Approximately 10 days' duration was given to the teachers to reflect on the questions. The reminders related to deadlines were given to achieve the highest response rate from the participants considering their busy schedules. A total of one month has been taken to conduct this survey to cover different levels of teachers and types of schools. The data analysis was done at the end and results and major findings were listed. The data analysis followed a simple

percentage distribution for the close-ended questions, and a descriptive overview of the major themes emerged on the basis of major transcriptions obtained for open-ended questions.

Results

Quantitative phase

The results showed that 46.20 per cent of private school teachers and 53.80 per cent of government school teachers participated in the study (Figure 1). Further, they were categorized into primary (4 per cent), secondary (50.8 per cent) and higher secondary (45.2 per cent) levels (Figure 2). More than half of the teachers (76.9 per cent) were aware of the Ed-Tech tools (Figure 3). Approximately 92 per cent of teachers who were aware, had agreed to the point that they have used Ed-Tech tools in their classroom teaching (Figure 4). 69.20 per cent of the teachers participating in the study agreed that they have received training either in the pre-service or in-service stage related to technological tools and applications (Figure 5). Among the participants, mostly all of them were aware of online meeting applications such as Google Meet and Zoom and social media platforms such as Whatsapp, Youtube and Facebook. Nearly half of them knew about Indian MOOCs such as SWAYAM. It was seen in the study that teachers were less aware of different Learning Management Software such as Edmodo, Moodle, Docebo, Schoology etc. (Figure 6).

Figure-1: Percentage of teachers belonging to different schools

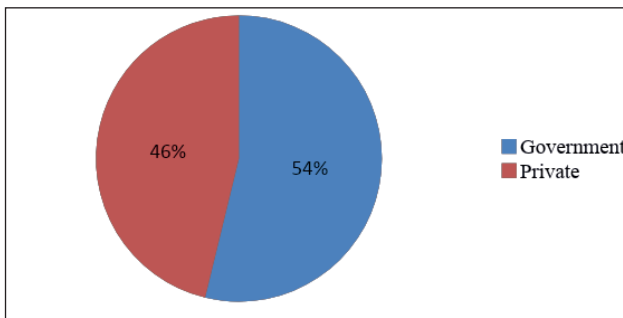


Figure-2: Percentage of teachers belonging to different school levels

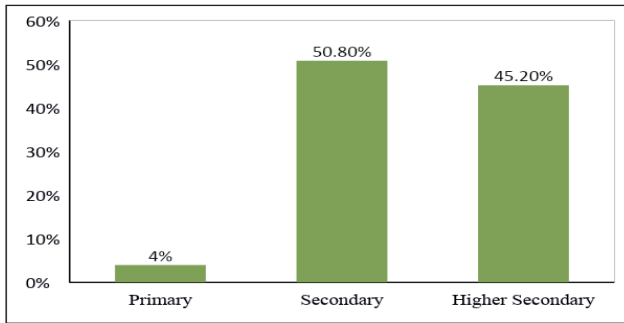


Figure-3: Percentage of teachers knowing about different Ed-Tech Tools

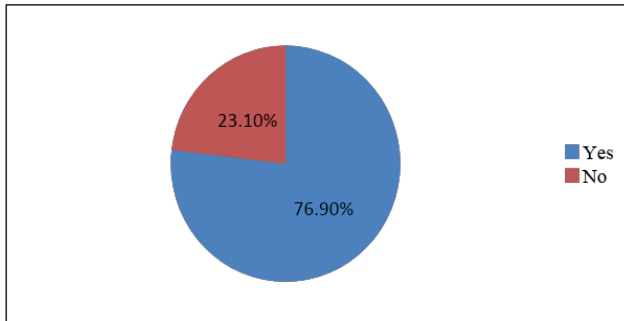


Figure-4: Percentage of teachers used Ed-Tech Tools while teaching

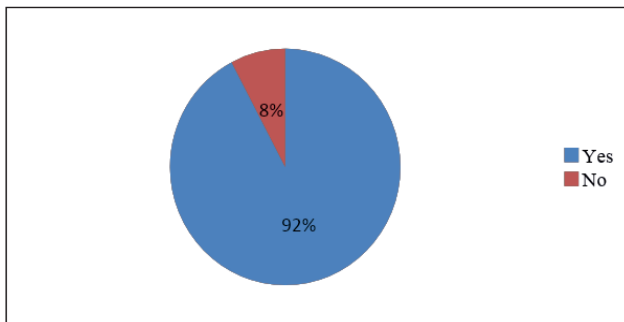


Figure-5: Percentage of teachers received pre-service or in-service training related to Ed-Tech Tools

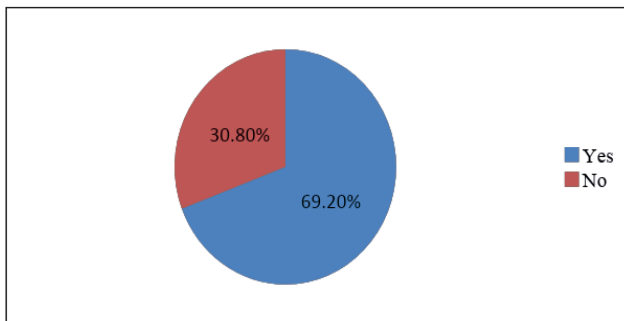
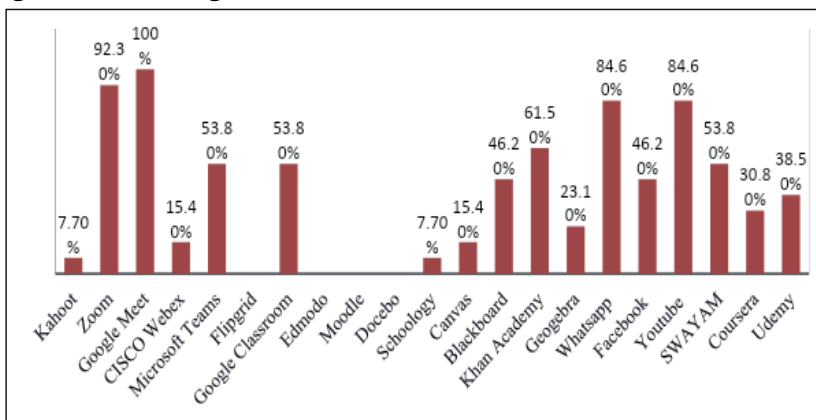


Figure-6: Percentage of teachers who are aware of recent Ed-Tech tools



Qualitative phase

The results of the open-ended questions revealed two prominent themes i.e. the major challenges and benefits of using the Ed-Tech tools that have been perceived by the teachers. The challenges which were largely stated by the teachers are summarized below:

- Need for revamping the teacher education curricula.
- Infrastructure and access-related issues.
- Most of the applications are proprietary licensing.
- Financial funds related issues.
- Technical difficulties and ethical problems.
- Economic affordability of learners.
- Parents' illiteracy.
- Cyber-crimes such as hacking of personal information.
- Distraction.

The major benefits of using Ed-Tech tools that were stated by the teachers are mentioned below:

Teacher 1: "It makes the teaching-learning process easier and makes the class more interactive because students not only learn by listening to

the lectures of teachers but also can see related visuals in the form of videos of related topics."

Teacher 2: "As a Mathematics teacher, I feel that few diagrams, such as 3D shapes, are complicated to be represented on board. They require great visualization and it can be done by ICT tools."

Teacher 3: "It keeps children interested."

Teacher 4: "ICT helps in streamlining the transaction of curricular content."

Teacher 5: "Very much."

Teacher 6: "Better understanding and visualization."

Teacher 7: "Use of diagrams, videos and e-content."

Teacher 8: "It is student-friendly. Students find it more attractive to learn something new."

Teacher 9: "In Biology, it is easier to teach using animated videos of every cycle and process."

Teacher 10: "They make the delivery of concepts much easier and lively and help the students imagine the concepts better."

Major Findings and Discussion

Our findings showed that the teachers

have a positive attitude towards using the Ed-Tech tools in teaching and learning. Similar results have been shown in several research studies where the majority of the teachers have shown favourable attitudes towards technological integration in the classroom to improve learners' academic performance (Abel et al., 2022; Bilwani & Zehra, 2016; Ghavifekr & Rosdy, 2015; Munyengabe, 2017). Further, we also found that some of the teachers have highlighted the commonly used Ed-Tech tools and also listed some tools that were not mentioned in the questionnaire. The results also showed that most of the teachers were using Google Meet and Zoom for teaching purposes, Google Classroom and Google Forms for formative assessments (short tests including MCQs one-word answers), taking attendance and collecting assignments. Some of the previous studies also reported similar findings (Dantes et al., 2022; Timothy & Silva, 2022). These studies revealed the effective and majorly used online platforms such as Zoom, Google Meet etc. and their helpful features that support teaching and learning. Apart from these, our findings also reported that the teachers had used Scratch, animated GIFs, Youtube tutorials, Aveti Learning, power points, smart boards, projectors, interactive panels, Whatsapp and Telegram groups for teaching and learning. Ogbonnaya (2019), in his study, also highlighted the perceived usefulness of different social media platforms, as mentioned above, in the teaching-learning process. Recently the focus of research has been more shifted towards AI-based Ed-Tech tools in K-12 education. Chounta et al. (2022) in his study also reported the importance of AI based tools and the need for teachers'

preparation regarding emerging technologies.

Implications

- The Ed-Tech is an emerging area of research therefore more emphasis should be given to new tools and technologies which have the potential to enhance the learning experiences
- This type of study can be a base for further research which can be extended by including certain interventions related to teachers' preparation and professional development in the context of particular regions

Limitations

Our study is a small scale pilot survey which has included few selected schools based on accessibility. We have considered limited Ed-Tech tools in each category. We have tried exploring the pre-conceived perceptions of the teachers towards the Ed-Tech tools rather than going for certain interventions and examine any change.

Conclusion

In this study the teacher perceptions of technological tools for pedagogic practices were analyzed, categorized and interpreted. Several challenges, issues, drawbacks, problems and interventions were investigated to learn more about how teachers view the use of technology in real classroom situations. This study will be helpful for different stakeholders involved in the teaching and learning process who will be able to understand the teachers' position and perceptions of integrating technology in real classrooms.

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