Teachers' Perspective of Technology Integration Effects on Students Learning At University Level

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Abstract

In order to create technologically proficient students in this age of digital natives, teachers' must improve their own technological literacy. Educators that incorporate technological tools into their lessons need to be knowledgeable professionals. Unfortunately, teachers at public universities are not prepared to make the most of the expansion possibilities offered by incorporating technology into their lessons. In this study, the expertise of four university teachers' were evaluated regarding use of technology in their lessons. Teachers' reflections, classroom observations, instructional artifacts, and semi-structured interviews provided the data. According to the results, educators were least confident in their content knowledge, followed by their technological knowledge, and finally by their pedagogical knowledge relevant to technology integration. Furthermore, they lacked a diversity of teaching techniques to provide a rich learning environment. The information that was gathered and analyzed thematically, as well as the conclusions that were drawn from the perceived understanding of the four educators regarding their confidence in their ability to use technology in the classroom, highlighted the significance of ensuring that all students have access to technology, the value of offering professional development opportunities based on technological expertise, and the requirement to prioritize instructional design for the purpose of technology integration. The resources that teachers require to integrate technology into their lessons in a way that is most beneficial to students are readily available to them. The findings of the study showed that teachers adapted their digital pedagogies in order to meet the requirements of their individual classrooms. To be considered technologically literate and competent, a one must not only have a firm grasp of digital resources but also a full understanding of the context in which such resources are used. For university instruction to be more effective, it is vital that faculty members improve their knowledge, abilities, and use of technology. The results of the study offer both an understanding of the thought processes of educators and evidence of their proficiency in the application of technology in the learning environment.

Keywords: _University Teachers, Technology integration, Students' Learning_

INTRODUCTION

Technology Integration in education

Today's technology is so integrated into daily life and culture that it defies easy categorization. McCrory (2008) states that the term "technology" is used to describe any item or process that can be used in a practical setting. Mishra and Koehler (2008) define technology as a collection

of tools made feasible by human knowledge of how to combine resources to create goods, solve problems, fulfil needs, or satisfy wants. The term "technology" encompasses both new and old methods of production (Koehler & Mishra, 2009). These prior empirical research all came to the same conclusion: the term "technology" encompasses not just the tools (such computers and the internet), but also the knowledge, expertise, and techniques used to complete a task. The term "technology integration" is used to describe the use of digital tools (such as computers, programs, the Internet, and peripherals like projectors and printers) in formal and informal learning settings. According to Hertz (2011), a technology-integrated classroom is one in which students utilize technology to learn and exhibit comprehension of course material, rather than simply to display mastery of a specific tool. As a result, educators have a variety of options for incorporating technology into the classroom, and students can be encouraged to do the same. In order to improve their students' learning, teachers can also make use of technological tools in conjunction with their pedagogical and subject-area expertise.

In today's world, where so many people were born and raised with computers at their fingertips, it's crucial that educators maintain and improve their skills in order to provide students with the best possible education. In addition, global advancements necessitate a swift shift in pedagogical philosophies and methods, necessitating a reworking or reconstruction of the current teacher education programs and structure. When educators are able to keep up with the latest developments in their fields, they are better able to expand their own pedagogical expertise, subject knowledge, and use of technological tools. Over the past three decades, one of the most important factors in raising the overall quality of teachers' instruction has been their participation in ongoing professional development. Teachers also need the option to keep abreast of the usage of digital technologies in the classroom as the importance of using digital resources in instruction grows. One key contributor to effective classroom outcomes is the widespread adoption of technological tools. When it comes to teacher development programs, many people have been concentrating on bettering classroom practices and expanding teachers' knowledge of subject matter (Harris et al., 2017). The need for teacher preparation that can adapt to shifting pedagogical technologies is emphasized by Abanobi & Abanobi (2017).

The role of the teacher has shifted from knowledge keeper to that of coach, mentor, enabler, facilitator, or advisor in today's information-rich, technology-driven society (Knight, Pedersen, & Peters, 2004). The teacher's job is to set the stage for learning and lead the class in the proper direction. Teachers should not rely solely on outdated practices to fulfill this function, but rather should be cognizant of the ways in which technological advances might improve the quality of instruction and student outcomes. According to one study (Swain, 2006), teachers' usage of technology in the classroom may have been influenced by their preparation during their first teacher education. Because most programs only require pre-service teachers to take one technology skills-based oriented course, they aren't preparing them to use technology in a pedagogically sound way (Chai et al., 2010). It is well acknowledged, however, that proficiency in technology is not sufficient for making successful use of technology in the classroom (Hardy, 2010). To put it another way, "preparing pre-service teachers for ICT integration is a complex job given the fast changing nature of ICT and the multiple sources of knowledge which need to be synthesized" (Chai et al., 2010). They all agreed that teachers need to know how to combine technology with pedagogy and content for it to be successful in the classroom (Mishra & Koehler, 2006). This is due to the fact that using technology in the classroom requires not only technical know-how, but also pedagogical expertise and subject matter expertise.

Effective use of technology in the classroom requires that these concepts be combined and addressed as a whole. Niess et al. (2009) highlighted that the International Society for Technology in Education has challenged educators to imagine what kids would need to know about technology in order to succeed in today's world. Teachers are being pressured, and in some cases forced, to use technology in the classroom, not just because it's cool, but because it will improve their practice and the learning of their students. This is because tools like these can strengthen students' abilities to continue learning and connecting throughout their lives. The roles and responsibilities of educators are shifting as a direct result of the impact and influence of technology on students' education. Teachers now have the tools to adapt their lessons to the learning styles of students who grew up in the digital age. Teachers' previous strategies and attitudes weren't working with today's tech-savvy students, thus they needed to evolve (Ali, Thomas, & Hamid, 2020).

RESEARCH FOCUS

This research focuses on teachers' knowledge and skills of technology and its integration of their teaching practices in order to improve their own professional capabilities and students' performance. This research also to focuses on the effectiveness of technological knowledge on students' performance through teachers' perceptions particularly reference to a public sector university in Karachi Pakistan.

LITERATURE REVIEW

The importance of using technology in the classroom has grown as a result of the need for educators to maintain the same level of technical fluency as their students. To keep up with the demands of today's "digital natives," who are fluent in using technology but also reliant on it for their daily lives (Prensky, 2001; Richards, 2014), it's necessary to adapt to their preferred learning styles. Features of the 19th and 20th centuries are distinct from those of the 21st century. Niess (2005) argues that the arrival in the 21st century has brought about a proliferation of new forms of technology, communication, and information that have altered not just our day-to-day lives but also our ability to pass on knowledge to future generations. Technology has become increasingly important in the classroom as a result of the exponential growth of information and the pervasiveness of electronic gadgets in modern life (Ali, Azam, & Saba, 2023) [Yalçn & elikler, 2011]. Today's civilizations are highly dependent on technology, and the rapid pace of technological advancement has altered both societal norms and individual attitudes and behaviors (Hixon & Buckenmeyer, 2009). According to Mishra and Koehler (2006), the widespread adoption of digital technology has drastically altered the daily routines of most areas of human employment, leading advocates of technology in education to anticipate comparable effects on the classroom setting. Technology's contributions to education include "the capacity to deliver interactive content, provide immediate feedback, diagnose student needs, deliver effective remediation, evaluate learning, and store examples of student work" (Watson & Watson, 2011;Okwumabua, Walker, Hu, & Watson).

Traditional course materials can now be sent to students in far-flung locations through the internet with relative ease (Kaldoudi, Dovrolis, Konstantinidis, & Bamidis, 2010). As a result, technology has made it easier for teachers to reach out to and interact with pupils who live far away. Therefore, technology has eased the burden of remote learning, whether it be synchronous or asynchronous. Blogs and wikis are facilitating this kind of asynchronous learning and delivery of educational and learning information and materials. According to Lai

(2008), students have benefited greatly from teachers' and students' open communication on various topics via email and video conferencing. Technology has been shown to enhance student-teacher communication when working together on projects (Kaldoudi et al., 2010). Students can experience virtual reality thanks to advancements in digital technology. Students have the opportunity to refine the skills that will be necessary for them to be successful in the job without ever having to put themselves in harm's way in the "real world." Students in one country now have the ability to collaborate with students in another country while working together inside of a digital laboratory environment. Osborne and Hennessy (2003) provided a more succinct summary of the benefits of information and communication technology (ICT) in education by noting that these tools help to speed up and improve the production of school work, boost motivation and engagement, facilitate exploration and experimentation, and promote self-regulated and collaborative learning. Osborne and Hennessy (2003) also mentioned that these advantages help to make the case for the use of ICT in education.

Using technology in the classroom comes with a number of advantages; however, there are also a few disadvantages to consider. According to Al-Bataineh and Brooks (2003), there are challenges associated with adaptability, connectivity, and compatibility, in addition to those associated with locating qualified personnel, the appropriate technology, sufficient resources, and adequate funding. (Chai, Koh, & Tsai, 2010; Yalcn & elikler, 2011) Despite these challenges, governments and other stakeholders in education are investing in technology in the belief that the affordances they bring would facilitate and improve teaching and learning. People are naturally fascinated about the precise methods in which modern educators are utilizing current technological tools into their teaching because of the high stakes that are involved. The availability of innovative technologies and the substantial investments that governments are making in education technology have both contributed to the rise in public interest in the efficacy of technology in the classroom. According to Alayyar et al. (2012), the general public has a legal obligation to be informed regarding the manner in which the expenditure of their hard-earned money on educational technology is managed and whether or not the technology is producing the results that were hoped for in the classroom. Because of the rapid advancement of technology and the various ways in which it is being utilized in schools, academic institutions are coming under increasing amounts of pressure to find ways to more effectively integrate technology into classrooms (Ali, Rehman, and Ullah, 2022).

METHODOLOGY AND PROCEDURE

The qualitative research approach (Creswell, 2014) was used in this study, and the experiences of four university faculty members, (two male and two female) in applying technology practices were studied and reported on. Making use of a semi-structured questionnaire Data was collected and analyzed using interviews, observations, teaching materials, and the teacher feedback. Before being considered for employment, teachers must have professional qualifications and have undergone trainings and professional development programs on technology and its use in educational settings. The research objectives and technical knowledge components were used to inform the development of tools (questionnaires, interviews, and observations) targeted at gathering data related to teachers' knowledge and teaching practices, as well as their use of technologies in their classes. The questionnaire was evaluated by experts in the field, and it was piloted with other teachers, who were determined to be valid; nevertheless, those data were deleted from the final analysis. The interview questions centered on the new standards and how teachers incorporate technology into their teaching practices in light of 21st century skills and the present digital world. This was done so that we could validate

the technological implementation and teaching approaches that we witnessed and observed in action in the classroom during the interviews. The checklists were created as a framework for the observations, and they included information about how teachers led the lessons. When faculty members at universities were requested to take part in interviews and observations. Just four of the six faculty members were able to take part in the research. Each interview lasted 50 to 60 minutes and was scheduled at the convenience of the faculty members. The interviews were place in a quiet section of the campus, away from other students and faculty. To avoid misunderstandings, the conversation was held in a combination of Urdu and English languages. Teachers were observed and their practices were recorded using observation checklists from the beginning to the end of meetings.

THEMATIC ANALYSIS AND FINDINGS

Key findings

The findings indicated that teachers had the least degree of confidence in their subject knowledge, followed by their technological expertise, and then their pedagogical understanding with regard to how technology may be integrated into the classroom. They also lacked strong plans for creating and implementing technology integrated instruction, a variety of teaching methodologies to present students with, and an inadequate grasp of how technology links with content areas and how to make alignments across content standards. In addition, they had an inadequate understanding of how technology interacts with content areas and how to make alignments across content standards. In addition, the thematic analysis of this study indicated that there should be adjustments made in the educational setting for both students and teachers, as well as in the physical configuration of classrooms. For example, providing access to helpful forms of technological apparatus. Increasing one's own digital literacy through education in emerging types of technology. Altering the set-up of the classroom in order to facilitate simpler learning. Providing a variety of training and educational programs with a focus on technological skills. Putting an emphasis on the significance of instructional design as it relates to the implementation of technology in the classroom.

DISCUSSIONS

Although integrating technology into the classroom is crucial to education's development, doing so in places like public institutions can be challenging due to instructors' lack of preparation. This research set out to examine the aforementioned issue by gauging the knowledge of four teachers from different educational institutions. In order to compile the data, we employed interviews that were only semi-structured. The findings indicated that teachers had the least amount of trust in their topic knowledge, which was followed by their technological competence, and then their pedagogical knowledge about the implementation of technology in the classroom. The results of three interviews with educators revealed five recurring themes in relation to the use of technology in the classroom.

These themes are as follows: (1) the necessity of placing a premium on instructional design for technology integration; (2) the provision of technical resources; (3) the necessity of fostering students' critical thinking skills through the use of technology; (4) the necessity of technology-based professional development opportunities for acquiring and enhancing technology literacy; and (5) reimagining the learning space to better accommodate technology. Because of these findings, the technological pedagogical and content knowledge (TPACK) framework's derivation and classification of technology integration competences for university instructors

may be utilized. The competencies can serve as a roadmap for teachers seeking additional information on how to successfully integrate technology into their lesson plans and classrooms. This study contributes to a better understanding of teaching strategies utilized at the university level by shedding light on the opinions held by faculty members regarding the incorporation of technology and identifying key skills for practice. The data and analysis also demonstrated that the professional competency of instructors, as assessed by their knowledge of the area and their use of technology, does not have a significant effect on the achievement of pupils. Second, teachers typically lack confidence in their own abilities when it comes to integrating various forms of technology and technical tools into the classroom. This is made even worse by the scarcity of possibilities for professional growth that concentrate on the incorporation of new technologies and the advancement of professional knowledge.

The participants in this study talked and indicated that they could accomplish, comprehend, or know the most of the activities mentioned in the items of the interview questionnaire; nevertheless, they were unable to totally execute the technological due to a lack of a suitable environment in the institutions where they worked. The outcomes of this study shed light on the fluid nature of the connection that educators have with various forms of technology. According to the findings, educators modify their degree of technical savvy to account for the particulars of the learning environment, and they have been seeking to develop their skills despite the scarcity of accessible means to do so. This is the case despite the fact that there are fewer available means. As a result, it is essential to lay a greater emphasis on the significance of contextual variables on the development of technology, its usage, and its application at the level of public sector universities, and it is also essential to embed technologies in the context. On the other hand, there is a paucity of research that focuses on the Pakistani context, and in the past, researchers have not placed a significant amount of importance on the relevance of contextual elements.

This study's results are in line with those of other studies conducted in a variety of settings around the world (Carpenter, et al., 2020; Harris & Hofer, 2017; Kirikcilar and Yildiz, 2018; Ali, Thomas, Ahmed, Ahmed, and Ahmed 2020; Ali, Busch, Qaisrani, and Rehman 2020; Ali, Thomas, and Hamid 2020; Ali, Ahmad, and Sewani 2020; Ali, Rehman, & Ullah, 2022; Ali, Azam, & Saba, 2023; Ali, Rehmat Shah, & Ahmad, 2023).As the literature of this study illustrates, several investigations have been undertaken on the relationship between teachers' technological expertise and the learning of their students in a range of settings across the globe and at various educational levels. These studies have been conducted at different educational levels. By exploring the effect of teacher technical expertise on student performance within the context of public sector universities in Karachi, Pakistan, the current study makes a substantial contribution to the existing body of research by addressing a gap in the existing body of information.

CONCLUSION

According to the findings of this research, one may draw the conclusion that university instructors lack the confidence to make effective use of various technologies in their classes. They are lacking in comprehension of fundamental computer and technology literacy. As a result, the impacts of instructors' professional knowledge and the integration of technology on the performance of their students are minor. According to the findings of the investigation, educators have been teaching content in a piecemeal fashion; nevertheless, there is a pressing requirement for the creation of a holistic, blended, and integrated nature as an alternative to

simply teaching each of the disciplines in isolation. The incorporation of up-to-date technical knowledge, skills, and a heightened awareness of these tools' potential in the classroom is a responsibility that falls squarely on the shoulders of educators.

Implications of the Research on Teachers' Educational Practice

This study shows that educators lack the technical expertise to effectively integrate technology into their classrooms. Their professional teaching and technological skills fell short, resulting in unproductive lessons for their students. This was especially true when it came to incorporating and making use of technological tools. Therefore, one must have concurrently and integrated developed their technical and computational thinking and usage of technological gadgets in order to build technological knowledge. The results of this study suggest that classroom instruction is improved when technology is used in tandem with human interaction. We need to move away from teaching technology as a separate subject and toward an infusion or embedded paradigm where technology is used in all subjects. Instead of learning content without the use of technology, teachers should be trained in a variety of teaching methods and strategies, including the pedagogies and tools they might use to teach those methods and skills.

Therefore, it's important to teach and model content, technology, and pedagogical abilities all at once. According to Koehler and Mishra (2009), a blended, integrated, and connected approach to technology, pedagogy, and material that takes into account the classroom circumstances will help students learn more effectively. Based on the results of this research, efforts to expand teachers' technology literacy should prioritize training them to think holistically. To meet the needs of today's tech-savvy students, educators must invest in their own professional development and keep up with the latest developments in the field of digital education. As a result, professional development programs for educators should shift their focus from preparing educators to teach with technology to preparing students to effectively integrate technology into their own classrooms and pedagogies.

Suggestions for future research

This study uncovered new avenues to explore in the field of technology integration. There is a widespread belief that teachers in Pakistan's public universities lack the necessary skills to effectively integrate technology into their classrooms, and that this lack of knowledge has a negligible impact on students' ability to learn. As a result, there is a pressing need to conduct in-depth research into the phenomenon of inadequate use of technology in education settings that cannot meet the challenges of the 21st century and this digital era. This calls for extensive investigation.

The quality of education in public institutions is still inadequate since students' academic performance is not good despite the fact that professors are properly qualified and professionally prepared and have also been blending technology in their teaching. Researchers should look at the causes of the widespread poor quality of education in this country. After all, a teacher's primary objective should be to maximize student learning. There is a need for more investigation into the ways in which the learning environment in the classroom and the scarcity of digital resources at the university level influence instructors' adoption of technology. So that researchers may investigate the topic of insufficient use of technology in education, it is necessary that future studies on stipulate the context focus on mixed methods designs.

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