Digital Technologies in Physics Education: Exploring Practices and Challenges

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Abstract
Recent research has indicated that the utilization of digital technologies among Nepal's secondary school teachers is minimal. A multiple case study research design was employed to explore how Physics teachers at the secondary level utilized digital technologies for teaching Physics and the challenges they encountered in adopting new instructional tools. The study revealed that Physics teachers occasionally incorporated YouTube videos to aid in explaining complex concepts. However, the abundance of digital resources available for Physics classes remains significantly underutilized. Furthermore, students were not encouraged to engage in collaborative learning and communication platforms. Nepal's Physics teachers faced various challenges, such as time constraints, in utilizing digital technologies for teaching purposes. These findings highlight the need for greater support and resources to assist teachers in overcoming these challenges and effectively integrating digital technologies into the classroom. This research provides valuable insights into the level of integration of digital technology in the classrooms of teachers who have access to digital resources and possess the necessary skills to use them effectively.

Keywords
Nepal; digital technology; secondary teachers; physics.

Introduction

Digital technologies are increasingly employed as educational tools worldwide, with claims that they can significantly enhance students' deep learning across all educational levels (Abdulrahaman et al., 2020, Dong et al., 2020). According to Xie et al. (2019), when used appropriately for teaching-learning, digital technology has the potential to bolster students' cognitive skills. Magen-Nagar and Firster (2019) argue that it can also elevate students' creativity, inquiry, collaboration, problem-solving, and exploration abilities. Soomro et al. (2015) note that digital technology can promote social interaction and communication among students and between students and teachers. Concerning learning outcomes in the field of sciences, Soomro et al. found that a higher level of technology usage was associated with more significant improvements in student learning outcomes.

The effectiveness of digital technology in education hinges on the knowledge, skills, and adaptability of educators. Lawless and Pellegrino (2007) emphasize that contemporary teachers should be adept at harnessing the potential of digital tools. They advocate for educators to utilize a range of information sources, including online databases, websites, e-books, and multimedia resources, to infuse innovation into their instructional methods. Through the integration of technology into their teaching practices, educators can customize both the content and the learning environment, opening up greater possibilities for student engagement and success.

Furthermore, digital technology empowers the creation of personalized learning experiences tailored to the unique needs, interests, and abilities of individual learners (Holm et al., 2019). Research has demonstrated a notable uptick in the adoption of digital technology in classrooms on a global scale. Many

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countries are enthusiastic about embracing technology-supported teaching methods as alternatives to traditional approaches (Dudeney, 2012). To maximize the positive impact of digital technology on education quality, educators must possess the requisite competencies and be willing to adapt their teaching practices to effectively incorporate technology. Through the integration of digital tools, teachers can craft engaging, personalized, and innovative learning opportunities that ultimately benefit students.

Nepal's approach to education policies has been strongly influenced by research advocating for the integration of digital technology into teaching practices, with a focus on benefiting students at all educational levels. This perspective aligns with the recommendations of researchers who emphasize the value of incorporating digital tools in education. This alignment is evident in Nepal's educational policy documents. For instance, in 2015, the Ministry of Education introduced a policy aimed at achieving several key objectives, including expanding access to education on an equitable basis, enhancing the quality of education, bridging the digital divide, and optimizing service delivery in education. Similarly, Nepal's Information and Technology Policy (2015) articulates a commitment to integrating digital technology into education with the goals of fostering innovation, improving access to information, and facilitating knowledge sharing.

These policies underscore the vital role of technology in enhancing the quality and accessibility of education in Nepal. By emphasizing the potential benefits of using digital tools to promote equity, elevate education quality, and expand access to information, Nepal's educational policies demonstrate a clear dedication to integrating digital technology into teaching practices.

Nepal's Information and Technology Policy (2015) mentions ambitious plans to introduce nationwide E-Schools and other initiatives aimed at promoting E-learning and E-Education. Additionally, the School Sector Development Plan (SSDP), which served as the guiding framework for Nepal's school education from 2016 to 2023, outlines intentions to implement programs focused on enhancing teachers' capacity to effectively utilize technology-based curricular materials. Furthermore, the SSDP aimed to provide digital equipment to teachers to facilitate technology-assisted instruction. These policy initiatives are designed to address structural challenges within the education system, enhance access to educational services, bridge quality gaps, and offer opportunities for personalized learning for students.

However, research findings indicate that Nepali teachers and teacher educators have been slow to embrace digital technology in their classrooms, and those who do often utilize low-level technology (Rana, 2018). Many teachers perceive digital technology as a distraction rather than a helpful tool for student learning. They also express concerns that incorporating technology demands additional time, which leaves them with insufficient time to cover the prescribed curriculum. Despite the government's call for widespread use of digital technology in classrooms, the practical integration of technology to achieve broader educational objectives remains limited, as highlighted by research (Dhital, 2018; Rana, 2020).

This study delves into the utilization of digital technologies by Physics teachers within private and public schools situated in Nepal's Gandaki Province. The primary objectives of this study encompass an exploration of the technologies these teachers employ, how they apply digital tools in their physics teaching, and the obstacles they encounter in integrating such technology into their classroom pedagogy. The study's overarching goal is to assess the scope and methodologies adopted by Physics educators in Nepal's Gandaki Province. The study participants possess advanced academic qualifications in Physics and have reported using digital for personal activities such as online banking, shopping, and learning. Specifically, this research endeavors to answer the following questions:

1. How do Nepal's physics teachers infuse digital technology into their instructional practices?
2. What challenges do physics teachers encounter in incorporating digital technology into their classroom teaching?

The increasing prevalence of digital technology in physics education in Nepal is expected to bring about significant changes in teaching and learning methods. However, despite this growing trend, there is currently a dearth of research concerning the utilization of digital technology by secondary-level physics teachers in Nepal. This study offers valuable insights into the extent to which digital technology has been integrated into the classrooms of teachers who have access to digital resources and possess the necessary skills to use them effectively.

The findings of this study hold great potential for the education community in Nepal as well as in the developing world, as they provide an overview of the current state of digital technology use in physics teaching. The study can also lay the groundwork for future research endeavors on the subject. Moreover, the study sheds light on the challenges that teachers encounter while incorporating digital technology into their classroom practices. These insights can be of value to policymakers and other stakeholders, helping them formulate appropriate policies and initiatives to support the effective integration of digital resources in physics teaching. This study serves as a starting point for exploring the role of digital technology in physics education within Nepal and contributes to ongoing discussions about how to harness technology to improve teaching and learning outcomes.

Literature Review

The integration of digital technology into curricula to improve students' learning outcomes, across all education levels and subject areas, has been an ongoing process since 1980 (Sarker, 2019). With digital technology becoming ubiquitous in our daily lives, educational systems worldwide are gradually incorporating it into the teaching and learning processes. According to Bransford et al. (2000) and Ditzler et al. (2016), integrating digital technology into teaching can significantly enhance students' learning achievements. Other researchers, such as Silvernail and Gritter (2007) and Suhr et al. (2010), contend that introducing digital technology into teaching provides students with access to an environment that can stimulate creativity and, subsequently, innovation. Numerous studies, including those by Bransford (2000), Grimus (2000), and James (2020), emphasize that the use of digital technologies in schools helps students better prepare for improved job prospects and a brighter future.

In the field of science teaching and learning, digital technologies have been found to be beneficial for both students and teachers. These technologies assist in the collection of valuable scientific information, facilitate interaction with the scientific community, and promote collaboration among peers (Gillespie, 2006). Additionally, teachers benefit from having access to comprehensive pedagogical resources (Al-Alwani, 2005).

While some researchers have reported positive outcomes resulting from the use of digital technology (European Commission, 2013), others have argued that teachers often fail to integrate digital technologies into their teaching practices (e.g., Harris et al., 2009). In a meta-study, Bingimlas (2009) compiled a list of barriers that explain why science teachers may refrain from using digital technologies in their classrooms. Bingimlas (2009) cited reasons such as (a) lack of confidence or competence, (b) skepticism regarding the utility of digital technologies, (c) insufficient practical training and encouragement, (e) limited available time, (f) restricted access, and (h) inadequate technical support. Several other studies, including Gialamas (2016), corroborate Bingimlas's findings. Furthermore, researchers have identified language as a significant barrier contributing to the limited or nonexistent use of digital technologies in physics teaching.

Nepal's Digital Technologies Policy and Implementation
Nepal's education policy, particularly the recent School Sector Development Plan (2023-2031), underscores the importance of incorporating digital technologies into classrooms across the country. The policy aims to ensure that both students and teachers have easy access to the resources provided by digital technology. Preceding the School Sector Development Plan, the National Curriculum Framework (2007, 2022) emphasized the need to connect schools with digital technology. The National Curriculum Framework (2022) envisions strengthening the capacity of institutions, administrators, and teachers to extensively utilize digital technology for effective teaching and learning purposes nationwide.

Similarly, Nepal's IT policy and the digital technologies outlined in the Education Master Plan have envisioned the development of digital technology infrastructure in schools and the enhancement of human resources, including teachers, to effectively harness digital technologies for teaching and learning. However, despite these policy commitments, there have been limited efforts to equip teachers with the skills needed to effectively use digital technological tools in their teaching, as highlighted by Rana et al. (2018). Studies have indicated that the utilization of digital technologies in Nepali classrooms is infrequent and remains at a rudimentary level.

Interestingly, Nepali schools have been gradually acquiring digital infrastructure over the years. In 2017, the Nepal Government allocated 1.5 billion Nepali rupees to assist 4000 secondary schools in acquiring computers, printers, and internet connectivity (Ministry of Education, 2017). This investment has significantly improved the digital technology infrastructure in schools over the past decade. Despite these developments, there remains a significant gap in the body of research on the use of digital technologies as pedagogical tools at all education levels in Nepal. Furthermore, studies have yet to examine the utilization of digital technologies in the teaching of physics at the secondary level of education in Nepal.

Methods
A multiple case study research method was used to examine the participants' forms and the scope of using digital technology to teach physics. The multiple case study research approach offers a detailed descriptive and interpretive account of the views and experiences of the participants at a deeper level (Creswell, 2018; Yin, 2018). The interpretative approach helps explain human behavior by interpreting the meanings that individuals attach to their experiences and actions.

Context
At the beginning of this research study, there were 19 secondary-level Physics teachers teaching in various public and private schools across Nepal's Gandaki Province. These educators had convened in Lumle, a small town in the Kaski district, one of the districts within the Gandaki Province. They had assembled to participate in an intensive three-day training program titled 'Physics Pedagogy at the Secondary Level.' The primary objective of this training initiative was to enhance the quality of physics education at the secondary level within the Gandaki Province. The organizers of this training program were particularly keen on having the facilitators showcase effective methods of integrating digital technologies into the teaching of physics.

The author of this article conducted two 90-minute training sessions with Physics teachers, introducing them to TPACK and providing guidance on incorporating digital technologies into their classroom teaching. A day prior to the training, participants were given a questionnaire consisting of six open-ended questions to gather information about their current use of digital technology and the resources available to them, as well as any challenges they faced. Out of the 56 teachers who attended the training, only 19 agreed to participate in the study, and only four of them fully engaged with the study.

Participants

The study involved four Physics teachers, each with an average teaching experience of fourteen years, hailing from various private and public schools located in Nepal's Gandaki Province. All the attendees were provided with a questionnaire, and out of the 19 teachers who responded to the questionnaire, only five expressed their willingness to partake in face-to-face interviews. One participant was excluded from the study as they failed to submit their lesson plans despite multiple requests. These participants collectively shared the common background of instructing the mandated secondary-level Physics curriculum to students in grades 11 and 12 in Nepal. A brief overview of the four study participants is outlined below.

Binod

Binod possesses extensive teaching experience, having served as an educator for 18 years, with a focus on instruction in science for a decade. In 2014, his school underwent expansion to include grades 11 and 12, at which point he was appointed to teach Physics. Binod holds a master's degree in Physics education. He observed that owing to resource limitations, many public schools in the Gandaki Province did not offer science subjects in grades 11 and 12. However, Binod's school was able to secure resources through community involvement and donations from visiting tourists, thereby enabling the institution to provide science education to its students. Binod capitalized on the availability of digital technology at the school to enhance his pedagogical approaches. He exploits the potential of YouTube videos and other digital materials to foster conceptual understanding of Physics concepts among his pupils.

Sagar

Sagar taught physics at a private school in Pokhara city for 15 years. He had a master's degree in physics, but no formal training in teaching. Despite this, he was passionate about helping students understand the subject more deeply. However, the physics curriculum he followed is quite prescriptive, leaving limited scope for inquiry-based learning. He primarily relied on lectures to convey the Physics material to his students. Nevertheless, he encouraged them to supplement their learning by exploring additional resources on the internet.

Rajesh

Rajesh had nine years of teaching experience. He worked in a private school in Baglung, a city near Pokhara, that demanded a 100% pass rate with high scores in Physics. “The demanding curriculum and high expectations from the school administration make it challenging to incorporate digital technology into teaching,” said Rajesh, adding, "The curriculum doesn't encourage the use of digital technology to teach Physics. The curriculum is completely outdated." Despite the limitations, Rajesh said he was a proponent of digital technologies. Whenever possible, he used them to illustrate complex Physics concepts to his students. He observed that students showed greater interest and enthusiasm in Physics when simulations were presented to them.

Rohan

Rohan has a 12-year tenure as an educator, with a diverse range of experiences teaching at various private schools. Currently, he is employed as a physics instructor at a private educational institution in Pokhara, his hometown. Rohan earned his Master's degree in Physics from Tribhuvan University in Kathmandu. He initially taught for four years in one of the private schools in Kathmandu prior to relocating to Pokhara in 2015. Despite his awareness of the potential benefits of digital technologies in education, Rohan laments the fact that the pressure to complete the prescribed curriculum leaves him with limited time to effectively integrate digital tools into his teaching practices. Moreover, he highlights the constraint imposed by standardized examinations administered and evaluated by the federal government, which necessitates his primary focus on preparing students for these assessments rather than exploring innovative, technology-based approaches to learning.

Data Collection

Quantitative data was collected using (i) questionnaires, (ii) semi-structured interviews, and (iii) lesson plans from the participants. The questionnaire with open-ended questions was designed to capture the participant's views, practices, and challenges to using digital technologies in Physics teaching. Informal discussions were conducted to determine the teacher's scope of the use of digital technologies in their classroom teaching.

Data Analysis

An inductive approach was used to analyze the data. The data were analyzed using constant comparative analysis (Strauss & Corbin, 1990). The inductive approach using the constant comparative analysis helped create meaning from four data sets by developing categories and themes. The main contents in teachers' written responses, interview data, and lesson plans were organized into descriptive themes (Miles & Huberman, 1994). The constant comparative analysis determined the themes and ideas around which the physics teachers reflected their experiences and actions.

Ethical Considerations

For this study, the author adhered to a robust ethical framework to ensure the integrity of the research process. Informed consent was obtained from all participants, affirming their voluntary participation. It is important to note that, in Nepal, there exists no specific education research protocol, but ethical procedures were applied. Participants were provided with a comprehensive briefing regarding the study's objectives, potential risks, and anticipated benefits, ensuring transparency throughout the process. Pseudonyms were utilized in place of real names to preserve the confidentiality of the participants.

The study data will be securely retained for a period of five years from the conclusion of the interviews. Participants were engaged in an audit and verification process of the interview data for the accuracy and integrity of the findings. Stringent measures have been implemented to protect the digital data repository. All study data have been securely stored in an author-managed Google Drive, fortified by a strong, confidential password, to ensure data security.

Results

The following section answers the first research question, "How do Nepal's physics teachers infuse digital technology into their instructional practices?" This section has addressed (a) the types of digital technologies used by Physics teachers and (b) how they infused digital technologies in classroom teaching.

Digital Tools for Teaching and Communicating

The four Physics teachers incorporated a range of digital learning resources to complement the mandated Physics curriculum. These resources encompassed YouTube videos, physics simulations, Physics-related websites, and lecture videos by prominent physicists. Notably, YouTube videos emerged as the most commonly utilized resource, with Binod and Rohan integrating them into their lessons on a regular basis. Rajesh opted to leverage PHET simulations, which are interactive online educational tools designed to aid students in visualizing and experimenting with scientific concepts, including those in physics. Additionally, Rajesh occasionally crafted numerical simulations and models using MATLAB. Gander (2015) described

MATLAB as a programming language and software environment for numerical computation, data analysis, and visualization.

On the other hand, Sagar encouraged his students to independently explore Physics videos, particularly those from distinguished universities like Stanford and Princeton. He didn't incorporate videos or simulations into his classroom sessions but motivated students to seek and engage with these resources independently. He urged students to pursue self-directed learning by listening to web lectures delivered by prominent physics professors. While the study couldn't confirm if students followed this advice, Sagar remained a proponent of self-learning, inspiring students to seek relevant resources themselves.

Binod employed PowerPoint presentations to convey instructional content, enhancing slides with abstract physics concepts and embedded videos. In his lesson plan, Binod indicated that he integrated YouTube videos after presenting content via PowerPoint slides.

The frequency of using PowerPoint slides varied among the four participants. Binod and Rohan occasionally played YouTube videos during class. Rajesh preferred physics simulations and MATLAB for complex concepts, although the exact frequency and effectiveness of his use of the tools remained uncertain. Rajesh mentioned PHET and MATLAB a number of times in the face-to-face interviews, but the lesson plans he submitted did not have a plan to engage students in any of the web-based teaching learning sites.

The data analysis also highlighted the participants' use of digital technology for communication. Zoom, email, and instant messaging enabled real-time interactions with students, irrespective of location. The Physics teachers primarily employed Facebook Messenger for communication but mainly for information exchange, not as a platform for learning exchanges. For instance, Rohan messaged students to inquire about absenteeism or assignment submissions, while Sagar occasionally sent emails with useful links.

In summary, the participants' utilization of digital technology varied, with some employing it more frequently than others. Nevertheless, this study underscores the potential of technology to enhance Physics education and underscores the vital role of teachers in guiding and supporting students' in-depth learning of Physics content and ideas.

Infusion of Digital Technology into Teaching and Learning

The study participants predominantly favored a traditional teaching mode known as stand-and-deliver, relying on conventional paper-based course materials. Binod, an experienced Physics teacher with eighteen years in the field, exemplified this approach:

> I explain the content to my students. For example, if the curriculum requires me to derive a formula, I do it on the whiteboard. I expect students to copy the derivation for future reference. I also solve complex mathematical problems on all topics that I teach. I chose the problems asked multiple times in the earlier year's evaluation tests. I also dictate notes to my students. It makes it easy for students to refer to my notes when they prepare for the standardised tests.

When asked if he used digital technology to teach physics, Binod mentioned occasional use, primarily for topics requiring visualization. Interviews with four teachers, including Binod, revealed that the majority of Physics teachers employed digital technology sporadically and at a surface level. Qualitative data unveiled a common process for integrating digital technologies. The process included (a) Searching for relevant YouTube videos or simulations, (b)Embedding the video within a PowerPoint presentation or showing it directly from YouTube, and (c) explaining the content on the slides before presenting the video to students.

Binod emphasised that he made his students watch the entire video before raising questions related to its content. He posited that stopping the video in the middle causes distractions. He decided which videos were suitable for his students. He said the chose particularly those that addressed abstract concepts. Interview data suggested that Binod and Rohan typically organized video-watching sessions up to five times a year. Students did not have a say in selecting relevant videos for the class.

Analysis of data revealed that the teachers typically provided context before playing a video. "I discuss the concept before showing the video," explained Binod. Surprisingly, after viewing the videos, the teachers seldom engaged students in discussions or sought their opinions on the video-covered concepts. It is likely that even when utilizing digital technologies, teachers adhered to a teacher-centered approach to instruction. Additionally, the study revealed that the participant teachers did not integrate digital technologies into Physics labs. "A fixed number of experiments are recommended for grades 11 and 12. None of the experiments require students to use digital technologies. Students set up the experiments, collect data, and perform the analysis on paper," said Rohan.

The following sections delve into addressing the second research question: "What challenges do physics teachers face when integrating digital technology into their classroom instruction?" Based on the interview data, it became evident that teachers encountered several challenges. These challenges included the limited quality of digital infrastructure, insufficient skills to effectively implement digital technologies for teaching physics, the demanding nature of the content-heavy curriculum, and pressure from school leadership to prioritize high scores over deep conceptual understanding. These factors collectively acted as impediments to the enthusiastic adoption of digital technologies for the teaching and learning of physics at the secondary level. The challenges of the teachers are explained in themes below:

Inferior Digital Infrastructure

The study showed that teachers predominantly relied on low-level technology to impart Physics knowledge to students in Nepal. All participating teachers proficiently utilized basic technological devices like projectors and whiteboards. However, challenges arose when attempting to integrate more advanced digital technologies. Internet connectivity emerged as a significant hurdle, with all teachers lamenting the slow internet speed at their schools. Binod pointed out the disruptive buffering during video presentations, which left students disengaged and frustrated.

Additionally, power cuts during class hours hindered the use of digital resources, as noted by Rohan and Rajesh. Sagar highlighted the complexity of implementing digital technologies, stating, "My teaching is no different than how I was taught a decade and a half ago." Furthermore, the study revealed that many students lacked internet access at home due to data cost constraints. Teachers believed that universal internet access would enable a broader utilization of digital technology for teaching. However, expensive mobile data prevented students from using internet-based educational resources, depriving a significant portion of the student population of access.

The study underscored the need for schools to invest in robust digital infrastructure, as slow or unreliable internet connectivity hampered communication, collaboration, and access to online learning resources. The absence of essential digital equipment such as laptops and projectors in classrooms further complicates the integration of digital tools. Teachers expressed frustration at the time-consuming process of taking students to computer labs to access these devices, leaving little time for meaningful use in a typical 45-minute class.

Teachers Need Digital Technology Integration Skills

The study revealed that all participants expressed a strong desire to integrate digital technology into their Physics teaching to create interactive and engaging learning environments. However, three teachers (Binod, Rohan, and Rajesh) acknowledged their need to develop technology integration skills. They lamented the lack of opportunities for training in this area and a lack of self-motivation to explore online resources independently. Rajesh, for instance, had not attended any professional development programs related to digital technology during his tenure.

While participants had some basic knowledge of technology integration, they stressed the importance of proper training to effectively incorporate digital technology into their teaching. They recognized the need for training to bridge the gap between their desire to use technology and their ability to do so effectively.

Time Pressure

One of the major challenges in integrating digital technology into Physics teaching was the demanding curriculum. Teachers expressed concerns about having limited time for computer-based experiments due to the pressure to cover the extensive syllabus. This time constraint led to a focus on traditional lecturing and providing notes to complete the curriculum, emphasizing memorization and test preparation over deeper learning.

Moreover, teachers faced pressure to ensure their students performed well on high-stakes assessments, which often led to a narrow focus on covering curriculum content rather than promoting a deep understanding of Physics concepts. Participants noted that their own performance was evaluated based on students' standardized test scores, further reinforcing this emphasis on curriculum coverage.

Lack of Support System

The study found that three participants encountered resistance from their school administrations when attempting to integrate digital technology into their teaching. Schools did not invest in necessary digital resources or provide training for teachers in technology integration. Participants believed that their schools were resistant to embracing alternative instructional approaches beyond traditional methods.

Rajesh explained that the school administration showed little interest in transforming the teaching and learning experience through digital technologies. This lack of support created missed opportunities to equip students with essential 21st-century skills.

Discussion and Implication

This study explored how secondary-level Physics teachers in Nepal integrated digital technologies into their teaching practices and the challenges they encountered. Four Physics teachers were part of the study, and they utilized various digital resources, such as YouTube videos, physics simulations, websites, and lecture videos, to supplement the government-mandated curriculum. Notably, YouTube videos emerged as a favored teaching tool, with teachers like Binod and Rohan frequently incorporating them into their lessons. Rajesh used PHET simulations and MATLAB for numerical simulations, while Sagar encouraged self-directed learning through reputable university websites.

Additionally, these participants employed digital technology for communication and instruction, making use of PowerPoint presentations and tools like Zoom and email for real-time interactions.

Challenges in adopting digital technology included inadequate digital infrastructure, the need for training, time constraints due to the demanding curriculum, and a lack of support from school administrations. Despite recognizing the potential benefits of digital technology for enhancing students' skills across various domains and supporting in-depth learning, the study found that teachers primarily used digital devices to passively play YouTube videos, without encouraging student reflection on the content. Moreover, teachers determined which videos students watched, limiting students' sense of autonomy and choice. These findings underscore the necessity for greater support and training for teachers to effectively integrate digital technologies into their teaching practices, promoting active learning, reflection, and an enriched educational experience for students.

Teachers tended to play YouTube videos when they perceived the content as abstract, aligning with Rana's (2020) observation that the incorporation of digital technology in Nepal's classrooms has been constrained. The study also revealed that teachers predominantly employed technology for real-time communication, such as addressing prolonged absenteeism or missed homework, without incorporating personalized learning support for students. None of the teachers actively promoted the use of digital technology for collaborative and peer learning.

Furthermore, the study highlighted several formidable challenges hindering teachers' ability and willingness to incorporate digital technology into their classrooms. These challenges encompass inadequate digital infrastructure, a lack of knowledge about digital technology integration, time constraints, and insufficient support systems to navigate the complexities of digital teaching. Addressing these challenges would require substantial efforts and resources, including investments in digital infrastructure, teacher training programs, and the development of robust support systems to enable educators to effectively integrate digital technology into their teaching practices. Overcoming these obstacles may pave the way for high-quality, digitally enhanced Physics teaching.

The study's findings partially align with those of European Commission (2013) and Bingimlas (2009), who investigated the challenges teachers face in implementing digital resources in their teaching. Like Bingimlas's findings, Nepali Physics teachers identified a lack of effective training, insufficient time, and limited access to computers with internet connectivity as significant obstacles preventing them from using digital resources to teach Physics lessons. These challenges faced by Nepali Physics teachers appear to be common and not unique, suggesting that the issues related to implementing digital resources in teaching are global in nature and warrant attention from policymakers and educators. These findings could inform the development of training programs and policies to address the challenges faced by Nepali Physics teachers, such as providing effective training, increasing access to technology, and mitigating time constraints. Furthermore, the findings underscore the importance of ongoing teacher professional development in effectively integrating technology into teaching and learning. Lastly, this study may inspire further research on the challenges and opportunities of implementing digital resources in teaching in Nepal and similar contexts.

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