

Pre-Service Teachers' Challenges in Technology Integration

Mary Joy P. Saavedra

Faculty, Bukidnon State University

ABSTRACT

This qualitative phenomenological study explores the challenges pre-service teachers (PSTs) face in integrating technology into their classrooms within the Philippine educational context. With the increasing emphasis on digital literacy and ICT integration in teacher education programs, it becomes essential to understand their experiences. Through semi-structured interviews with ten PSTs, the study uncovered five key themes: (1) technical proficiency and digital literacy, (2) safety, privacy, and security concerns, (3) over-reliance on technology, (4) educational disruption and distraction, and (5) infrastructure limitations. Findings reveal that while PSTs recognize the value of technology in enhancing instruction, they face significant barriers related to competence, confidence, and contextual limitations. These insights underscore the need for a more responsive and supportive teacher education curriculum that equips future educators with not only technical skills but also pedagogical strategies for meaningful technology integration.

KEYWORDS: Pre-service teachers, technology integration, digital literacy, ICT in education

INTRODUCTION

In the Philippines, the landscape of pre-service teacher education is evolving significantly, driven by the integration of technology in teaching and the shifting paradigms of educational standards due to globalization and technological advancements. Pre-service teachers in the Philippines face a unique set of challenges that are reflective of the broader educational and socio-economic contexts of the country.

The overall education framework in the Philippines emphasizes the importance of equipping future educators with the skills and knowledge necessary to handle the digital age's demands. This preparation involves not only traditional pedagogical techniques but also extensive training in the use of educational technology tools. Pre-service teacher education in the Philippines faces numerous challenges, notably in preparing teachers for the integration of information and communication technology (ICT) in the classrooms. Studies conducted by Lausa, Balinario, and Arceño (2024) highlight gaps in ICT readiness among pre-service teachers, stressing the need for continuous quality improvement in teacher training institutions to address these shortcomings. Several challenges also threaten the quality of technological training for Filipino students rooted from infrastructure and facilities, training of teachers, and the effective integration of ICT in the curriculum and the proficiency and confidence with it comes to automated teaching systems (Tomaro, 2018; Duero et al., 2023).

The primary aim of this research is to identify the challenges that the pre-service teachers encounter in integrating technology into their classrooms. The study intends to provide insights that can be utilized to aid in pre-service teacher training curricula to better meet the technological demands of modern classrooms. The findings of this research would contribute to the enhancement of teacher education programs in the Philippines by providing evidence-based recommendations for curriculum adjustments. By understanding the challenges faced by pre-service teachers, educational institutions can better prepare future educators for the digital demands of teaching, ultimately improving the educational outcomes for students across the country.

METHODS

This study employed a qualitative phenomenological research design which explored the challenges and support needs of pre-service teachers regarding technology integration in their classrooms. A total of ten (10) Bachelor of Secondary Education pre-service teachers from a single educational institution were selected using purposive sampling to ensure a representative mix of genders and ages. In this case, participants were selected based on their direct involvement in pre-service teaching and their exposure to technology integration in their practicum experiences. Data collection was conducted through semi-structured interviews, each lasting approximately twenty (20) to thirty (30) minutes, either face-to-face or via online platforms like Zoom and Google Meet, depending on the availability of the participants.

The interviews were designed around a set of open-ended questions aimed at eliciting rich, descriptive accounts of participants' expectations and perceptions regarding the integration of technology into their teaching practices. Questions focused on the challenges they experienced in using technology. The data from these interviews were analyzed using thematic analysis by Braun and Clarke (2006). This involved a coding process where initial codes were identified and categorized to form broader themes that capture the participants' experiences and views. These themes were then reviewed and validated to ensure they represented the data collected.

Ethical considerations were rigorously maintained throughout the research process, with all participants providing informed consent and assured of their right to confidentiality and anonymity. Data was handled with strict privacy measures to remove any personal identifiers. This phenomenological approach aims to provide deep insights into the experiences of pre-service teachers, although it is acknowledged that the findings may not be generalizable beyond the studied sample due to the limited scope and the inherent subjectivity of qualitative analysis.

RESULTS AND DISCUSSION

Technical Proficiency and Literacy

Many preservice teachers (PSTs) identified the need for technical proficiency as a primary barrier to effective technology integration in educational settings. They expressed their concerns about their own literacy in technology as well as that of their students. The complexity of technology and the need for ongoing updates contribute to these challenges. It has been observed that PSTs like to explore more about different technology to be part of their lesson planning and classroom demonstrations such as using online tools and generative artificial intelligence (AI). The rapid pace

of technological change means that PSTs may not have a strong technical background due to their limited exposure to these software and hardware.

Additionally, these experiences of the PSTs may impact on their teaching confidence, student engagement, and overall professional development. Apriyanto et. al (2025) points that successful integration of digital literacy requires a combination of pedagogical strategies, conducive policies, and robust technological infrastructure. It is worth noting that even if the PSTs are familiar with basic technology uses, they often struggle with more sophisticated integration of technology necessary for educational settings (Farjon, Smits, & Voogt, 2019; Giovanni, 2019). Enhancing PSTs' technical skills through training can address these concerns.

Safety, Privacy, and Security

Concerns about data privacy and the safety of technology use in educational environments are given significant emphasis in the results. PSTs highlight a heightened awareness and apprehension about the risks associated with using digital platforms and tools in classrooms. These risks mainly revolve around data privacy and security of technology systems used to manage and store sensitive information. These concerns PSTs who are uncertain about the security of digital tools may hesitate to incorporate technology into their teaching, potentially missing out on the benefits of digital education tools. The PSTs were also concerned with the capacity of electrical wirings that might exceed its limits and might cause accidents knowing that if all of the students will use digital at the same time and it is being plugged in using electricity.

This reflects a growing awareness of digital safety issues, as underscored by (Johnson et al., 2016), who emphasized the importance of robust digital security training in teacher preparation programs. Ensuring that PSTs are well-versed in privacy laws and data protection strategies is crucial for their readiness to manage technology in the classroom. PSTs are apprehensive about the risks associated with digital platforms and tools used in the classrooms, reflecting broader concern about student data security and personal privacy (Altun, 2019).

Over-Reliance on Technology

PSTs expressed concerns about potential over-reliance on technology, fearing that it could lead to a decrease in the quality of learning and increased student inactivity. In this digital age, everyone can use technology for their convenience. However, when it comes to classroom setting, PSTs mentioned that they are afraid that their students will depend more on using technology. This may lead to overdependence on technology to the point that everything that they will do, will depend on the available technology. For example, students will be asked to write an essay, it will be easy for them to ask online tools such as those AI powered generative tools like ChatGPT, Gemini, Perplexity, and other AI tools. Other PSTs mentioned also that overreliance on technology might cause some problems especially if it fails or becomes inaccessible during the lesson; the teachers might not be able to proceed to the next part of their lesson.

These apprehensions are consistent with the observations of Alessa (2023), who discussed the balance between technology use and traditional teaching methodologies. Addressing these fears requires education PSTs on effective pedagogical strategies that incorporate technology as a complement rather than a substitute for traditional teaching methods. Corroborating this, Çela (2024) highlights that AI-assisted learning can enhance certain educational outcomes, but excessive reliance on it can hinder independent problem-solving abilities. Moreover, prolonged use of

technology such as smartphones negatively affects sleep quality, mental and physical health academic performance, and social interactions among students (Kee et al., 2025), proposing that educators use technology to enhance rather than replace traditional learning activities.

EDUCATIONAL DISRUPTION AND DISTRACTION

The potential for technology to cause more distractions than benefits was a significant concern among the PSTs. This theme highlights the complex relationship between technology and classroom dynamics. As perceived by the preservice teacher, a common concern is that while technology can be a powerful educational tool, it also introduces potential distractions that can undermine its benefits. One of the participants underscored the dual challenge of ensuring equitable access to technology and managing its potential to distract students. This concern reflects real world classroom scenarios where students may get sidetracked by non-educational content on their devices, leading to reduced focus and engagement in their studies. Participants expressed concerns about students losing focus, the negative impact on attention spans, and the inconsistent availability of technological resources. These insights highlight real-world classroom struggles where teachers have to balance the benefits of technology with its potential to distract and disrupt learning. Effective integration of technology requires careful planning and adaptability to enhance educational experiences without undermining student engagement and focus.

This issue is highlighted in the work of Hasmirati (2024), who found out that integrating technology into educational management can enhance efficiency and student engagement, but requires proper implementation strategies.. Training PSTs in classroom management techniques for digital environments can help mitigate these challenges. Also, investigations into classroom dynamics suggest that while technology can enhance learning, it can also significantly disrupt attention and engagement if not integrated thoughtfully (Bahciyan, et al., 2019).

Infrastructure Limitations

Many PSTs pointed out the limitations posed by inadequate physical infrastructures such as internet connectivity, especially in rural areas. This highlights the significant challenges in the availability of adequate internet connectivity and the lack of technological devices. One of the participants mentions the unstable internet connection which is a common barrier that disrupts the smooth integration of technology in teaching. Similarly, another participant observed the unavailability of gadgets emphasizing the difficulty in utilizing digital tools to enhance learning. These experiences reflect the broader reality for many students and teachers who struggle with limited resources, making it challenging to fully benefit from educational technologies. Addressing these limitations is crucial for ensuring that all students have equal opportunities to engage with and benefit from modern educational practices.

Similar findings were presented by Aini (2025), who called for significant investment in educational technology infrastructure is needed to ensure equitable access to digital resources across different geographical and socioeconomic contexts. Insufficient infrastructure significantly limits the scope and effectiveness of technology use in education (Caner & Aydin, 2021).

CONCLUSION AND RECOMMENDATION

This study explored the challenges faced by pre-service teachers in integrating technology into their classrooms. It was revealed that PSTs encounter barriers related to technical proficiency, concerns about digital safety and privacy, over-reliance on technology, classroom distractions, and infrastructure limitations. These issues reflect both internal challenges within teacher preparation programs and external constraints such as resource availability and institutional support. Despite recognizing the value of educational technology, PSTs often feel underprepared to integrate it meaningfully and equitably into their instruction.

In response to these, it is recommended that teacher education institutions strengthen digital pedagogy training by embedding practical, pedagogical, and ethical dimensions of technology use across the curriculum. Programs may incorporate hands-on experiences, promote reflective practices, and offer explicit instruction on data privacy and classroom management in digital environments. Additionally, educational stakeholders may address infrastructure gaps and provide equitable access to digital tools and internet connectivity, especially in underserved areas. By aligning technology integration training with real-world teaching contexts, institutions can better equip future educators to navigate the digital demands of confidently and effectively 21st century classrooms.

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