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Digital Pedagogical Practices of Generation Z Teachers in Primary Education: A Qualitative Study

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ABSTRACT

This study aims to analyze the digital pedagogical practices of Generation Z teachers in primary education, focusing on how they design, implement, and adapt digital-based learning, as well as the challenges they encounter. A qualitative case study approach was employed, involving five Generation Z teachers. Data were collected through semi-structured interviews, field notes, and documentation, and analyzed using thematic analysis to identify key patterns in instructional design, technology integration, and professional attitudes. The findings reveal that Generation Z teachers actively utilize digital platforms for learning management, assessment, and instructional media, demonstrating creative, flexible, and student-centered approaches. However, challenges remain, including limited infrastructure, unequal access to professional training, and time management constraints. The study implies that effective digital pedagogy among Generation Z teachers is shaped by the integration of pedagogical competence, digital literacy, and adaptive professional attitudes, highlighting the need for continuous support in infrastructure and professional development.

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INTRODUCTION

The rapid advancement of digital technology has fundamentally transformed educational practices, particularly in primary education, where foundational learning experiences are shaped. This transformation is important because education systems must prepare learners with competencies relevant to a digitally driven society. The integration of technology into pedagogy is not merely a trend but a necessity to enhance student engagement, critical thinking, and learning outcomes. Empirical studies indicate that digital tools, when used pedagogically, can significantly improve students' motivation and conceptual understanding (Binabise et al., 2024; Wang et al., 2024). Furthermore, meaningful technology integration enables personalized and interactive learning

environments, aligning with contemporary educational demands (Aldino et al., 2025; Sabri et al., 2024). However, the effectiveness of such integration depends on how teachers design and implement digital learning strategies. Therefore, digital pedagogy emerges as a crucial component in ensuring that technological advancements contribute meaningfully to educational quality and societal development (Bećirović 2023).

Despite the recognized importance of digital pedagogy, many education systems continue to face challenges in its effective implementation, particularly at the primary school level. One major issue is the gap between technological availability and pedagogical application, where technology is often used superficially rather than strategically to support learning objectives. This problem is significant because ineffective integration may lead to disengagement and limited learning impact. Studies have shown that teachers frequently struggle to align digital tools with pedagogical goals, resulting in suboptimal instructional practices (Runge et al., 2023; Timotheou et al., 2023). Additionally, disparities in access to infrastructure, insufficient professional development opportunities, and limited institutional support further exacerbate the problem (Mhlongo et al., 2023; Oshowole 2024). These challenges highlight that possessing technological resources alone is insufficient; teachers must also develop the competencies required to integrate them effectively. Consequently, addressing this problem is essential to ensure that digital transformation in education leads to meaningful and equitable learning experiences.

In practice, the implementation of digital pedagogy in primary classrooms reveals a complex and varied landscape, particularly among Generation Z teachers. As digital natives, these teachers are generally familiar with technology and tend to incorporate various digital platforms, interactive media, and online assessment tools into their teaching practices. Observations indicate that they often demonstrate creativity and flexibility in designing learning experiences, adapting digital tools to meet diverse student needs (Huda 2024). However, this apparent readiness does not always translate into effective pedagogical integration. In many cases, the use of technology remains fragmented or limited to administrative and presentation purposes rather than fostering deeper learning engagement. Additionally, constraints such as limited infrastructure, inconsistent internet access, and time management challenges influence how digital pedagogy is enacted in real classroom settings. These field realities suggest that while Generation Z teachers hold significant potential, their practices require deeper examination to understand both strengths and limitations.

Existing literature has extensively explored the integration of digital technology in education, emphasizing its potential to enhance teaching and learning processes. Research indicates that Generation Z teachers possess

distinctive characteristics, such as technological fluency, adaptability, and openness to innovation, which position them as key agents in advancing digital pedagogy (Binabise et al., 2024; Erişen and Bavlı 2024). Studies also highlight their tendency to utilize diverse digital tools, including learning management systems, multimedia resources, and online assessments, to support instructional delivery (Kumar and Mamgain 2023; Pramesworo et al., 2023). Moreover, digital pedagogy frameworks stress the importance of integrating technology with pedagogical strategies to create meaningful learning experiences (Bećirović 2023). However, much of this research focuses on general competencies or quantitative assessments, often overlooking the nuanced, context-specific practices of teachers in actual classroom settings. As a result, there remains limited understanding of how these competencies are enacted in real teaching situations, particularly in primary education contexts.

Although prior studies provide valuable insights, several limitations remain that create a significant research gap. First, many studies emphasize technological skills rather than examining the holistic integration of pedagogy, technology, and professional attitudes. Second, research often adopts large-scale or survey-based approaches, which may not capture the depth of teachers' lived experiences and decision-making processes in classroom practice (Runge et al., 2023; Timotheou et al., 2023). Third, there is limited focus on primary education, where pedagogical approaches differ substantially from higher education contexts and require more adaptive and student-centered strategies (Mhlongo et al., 2023; Oshowole 2024). Furthermore, few studies specifically investigate how Generation Z teachers navigate challenges such as infrastructure limitations and professional development constraints while implementing digital pedagogy. This gap is critical because understanding these dynamics is essential for designing effective interventions and policies. Therefore, more in-depth qualitative research is needed to explore these issues comprehensively.

This study offers a novel contribution by focusing on the lived experiences and pedagogical practices of Generation Z teachers within primary education through a qualitative case study approach. Unlike previous research that primarily measures competencies or technology usage, this study examines how teachers design, implement, and adapt digital pedagogy in real classroom contexts. The novelty lies in integrating three key dimensions: instructional design, technology integration, and professional attitudes, providing a holistic perspective on digital pedagogy. Additionally, this study highlights the interplay between teachers' digital literacy and their pedagogical decision-making, offering deeper insights into how digital practices are shaped by contextual factors. By addressing the limitations of prior studies, this research contributes to the development of more nuanced and contextually relevant understandings of digital pedagogy. This is particularly important for informing teacher training programs and educational policies aimed at strengthening digital competence in primary education settings.

Based on the identified gaps, this study addresses the central research problem: how Generation Z teachers implement digital pedagogical practices in primary education, and what challenges influence their effectiveness. This study

argues that while Generation Z teachers possess strong technological familiarity, effective digital pedagogy depends on the integration of pedagogical competence, digital literacy, and adaptive professional attitudes. It is hypothesized that meaningful digital learning occurs when teachers are able to align technology use with instructional goals and student needs, rather than using it as a supplementary tool. To explore this, the study adopts a qualitative approach to capture in-depth insights into teachers' experiences, strategies, and challenges. The findings are expected to contribute to both theory and practice by providing evidence-based recommendations for enhancing digital pedagogy. Ultimately, this research aims to support the development of more effective, inclusive, and sustainable digital learning practices in primary education.

RESEARCH METHODS

This study employed a qualitative approach using a case study design to analyze the digital pedagogical practices of Generation Z teachers in primary education. The qualitative case study was selected because it enables an in-depth exploration of complex phenomena within real-life contexts, particularly in understanding how teachers design, implement, and adapt digital learning practices. This approach is appropriate for capturing participants' experiences, perspectives, and contextual factors influencing their pedagogical decisions. The study was conducted at an elementary school, chosen due to its active implementation of digital-based learning practices and the presence of teachers categorized as Generation Z. The research participants were selected using purposive sampling based on specific criteria, including age classification within Generation Z, teaching experience, and active engagement in digital learning environments.

Data were collected through multiple techniques to ensure comprehensive and rich information. In-depth interviews were conducted to explore teachers' experiences, beliefs, and strategies in implementing digital pedagogy. Classroom observations were carried out to examine actual teaching practices and the integration of digital tools in instructional activities. In addition, documentation analysis was used to review teaching materials, lesson plans, and digital media utilized by the teachers. The combination of these data collection techniques allowed for triangulation, enhancing the credibility and depth of the findings by capturing both reported and observed practices.

Data analysis was conducted using an interactive thematic analysis process, involving data condensation, data display, and conclusion drawing or verification. In the data condensation stage, raw data from interviews, observations, and documentation were systematically selected, simplified, and coded to identify meaningful units. These codes were then organized into categories and themes during the data display stage, allowing patterns and

relationships to emerge. Finally, conclusions were drawn and continuously verified by comparing findings across data sources to ensure consistency and validity. To strengthen the trustworthiness of the study, triangulation of sources and methods was applied, ensuring that the findings accurately reflect the participants' experiences and the research context.

RESULTS AND DISCUSSION

Results

The findings of this study indicate that the digital pedagogical practices of Generation Z teachers in primary education consist of two main themes: digital pedagogical approaches and the implementation of digital learning, each comprising several subcategories. To provide a clearer conceptual understanding, these findings are also illustrated in Figure 1, which presents the relationships between themes and subcategories identified in this study.

The digital pedagogical approach of Generation Z teachers begins with digital planning, in which teachers design the learning sequence and determine the use of technology in advance. As one participant (N2) stated, "before teaching, I already think about what media is suitable and how to sequence it so that students are not confused." Instructional practices also consider methods appropriate for primary school students, as their characteristics require simple and concrete approaches. This is reflected in N4's statement: "if the method is too complicated, elementary students get bored quickly, so it must be adjusted to their age." During the learning process, teachers foster digital interaction to maintain student engagement. For example, N1 explained, "I often invite students to ask and answer questions through digital media so they remain interactive."

Despite integrating technology, teachers emphasize maintaining educational values, ensuring that learning objectives remain central. As N5 noted, "technology is only a tool; what matters is that the values and learning goals remain." Teachers also demonstrate openness to change, selective media use, flexibility, and adaptability in addressing classroom challenges. Confidence in using technology emerges through continuous experimentation, while reflective practices help evaluate instructional effectiveness. Furthermore, teachers adopt practical and efficient approaches by selecting user-friendly technologies and managing time effectively. Overall, these approaches are largely experience-based, as teachers rely on prior teaching experiences to shape their digital pedagogical strategies.

The implementation of digital learning is characterized by the use of accessible and practical digital media. Teachers select tools that are easy to use for both themselves and students, as emphasized by N3: "the digital media I choose must be easy to use so it does not complicate things." In practice, teachers utilize various learning platforms, such as Google Classroom, to support classroom activities (N1). Presentation media also play a key role in delivering content effectively, with visual slides helping students better understand the material (N5).

Digital learning is designed to enhance student participation, with students becoming more active in asking and answering questions (N2). Teachers also assign digital tasks to promote student independence and responsibility

(N4). Instructional implementation is adjusted based on available facilities, ensuring effectiveness despite limitations (N1). Assessment is conducted digitally to simplify grading processes (N3), while online communication supports interaction beyond classroom hours (N5). Learning materials are designed to be simple, visually engaging, and contextually relevant to students' daily lives. Teachers also demonstrate flexibility in adjusting strategies according to classroom conditions. Finally, digital learning is structured to be time-efficient, enabling optimal learning without compromising instructional goals.

Figure 1. Data Analysis Results Using Atlas.ti 9

The figure illustrates the interconnected structure of digital pedagogical practices, highlighting two main themes: digital pedagogical approaches and the implementation of digital learning. The first theme encompasses various dimensions such as digital planning, adaptive and flexible teaching strategies, reflective practices, technological confidence, and experience-based approaches. The second theme focuses on practical classroom implementation, including the use of digital platforms, interactive media, digital assessment, online communication, and context-based learning strategies. The diagram also demonstrates how these subcategories are interrelated, forming a comprehensive and dynamic model of digital pedagogy. Overall, the figure emphasizes that effective digital pedagogical practices are not isolated components but an

integrated system shaped by pedagogical competence, technological skills, and contextual adaptation.

Discussion

The findings reveal that the digital pedagogical approaches employed by Generation Z teachers in primary education are adaptive, contextual, and student-centered (Wajdi et al., 2024). These results suggest that Generation Z teachers do not perceive technology merely as a supporting tool but as an integral component of pedagogical strategy, consciously and reflectively designed (Binabise et al., 2024). This aligns with the Technological Pedagogical Content Knowledge (TPACK) framework, which emphasizes the integration of technology, pedagogy, and content knowledge (Jibril and Adedokun-Shittu 2024).

Furthermore, digital pedagogical approaches are characterized by flexible planning and context-sensitive media selection, tailored to the developmental characteristics of primary school students (Wajdi et al., 2024). Teachers demonstrate the ability to adapt instructional strategies based on classroom conditions, available resources, and student responses (Sigalla and Kimario 2025). This reflects contextual pedagogical competence, where teachers align digital practices with students' cognitive and social development stages (Blyznyuk et al., 2025). These findings reinforce the view that effective digital pedagogy is not standardized but situational and adaptive (Oguntoye 2024).

Digital interaction and experiential learning are also key features of Generation Z teachers' pedagogical approaches (Dogan and Arslan 2025). Teachers use technology to promote active participation, two-way communication, and student engagement (Aspandi and Muttaqin 2025). This approach aligns with constructivist learning theory, which positions students as active participants in constructing knowledge through meaningful learning experiences (Al Abri, Al Aamri, and Elhaj 2024). However, the effectiveness of digital pedagogy is influenced by external factors such as infrastructure availability and institutional support (Timotheou et al., 2023). Limited resources and unequal access to technology remain significant challenges (Mhlongo et al., 2023), highlighting the need for policy support, infrastructure development, and continuous professional training (Binabise et al., 2024). Overall, these findings indicate a shift in teachers' roles from knowledge transmitters to designers of learning experiences.

In terms of implementation, digital learning practices among Generation Z teachers are practical, flexible, and oriented toward instructional effectiveness (Wajdi et al., 2024). Teachers integrate technology into daily activities, including content delivery, assignments, communication, and assessment (Mayildurai et al., 2024), reflecting a transition toward more dynamic and responsive learning environments (Arrasyid et al., 2025). Flexibility is a defining characteristic, as

teachers adjust technology use based on classroom conditions, available facilities, and student readiness (Mane 2025). Digital learning is often blended with offline methods to maintain effectiveness, demonstrating teachers' ability to manage contextual learning environments (Lu and Wang 2023).

Moreover, digital learning implementation supports active student engagement through interactive media and digital assignments (Lu and Hanim 2024). The simplicity of selected tools enhances learning effectiveness, particularly for primary school students (Tanaka 2025). However, challenges related to infrastructure and technical support persist (Kosgei, Kipkoech, and Limo 2023; Pons et al., 2023). Therefore, sustainable digital learning requires consistent institutional support, including infrastructure provision and policy development (Nwakoby and Iloka 2025). In conclusion, the successful implementation of digital learning depends on teachers' pedagogical competence and their ability to align technology with students' characteristics (Suchita et al., 2023).

CONCLUSION

This study highlights that Generation Z teachers in primary education demonstrate strong capabilities in developing and implementing digital pedagogy in adaptive and contextual ways. The most important insight from this research is that effective digital pedagogy goes beyond the mere use of technology; it requires thoughtful instructional planning, appropriate selection of methods and media aligned with students' developmental characteristics, and the preservation of educational values. Generation Z teachers utilize digital tools to enhance interaction, engagement, and learning effectiveness while continuously adjusting their practices to classroom conditions and available resources. These findings underscore a significant shift in the role of teachers—from knowledge transmitters to designers of meaningful learning experiences—reflecting the demands of 21st-century education. The strength of this study lies in its contribution to the academic discourse on digital pedagogy by providing a holistic understanding of how pedagogical competence, digital literacy, and professional adaptability intersect in real classroom practices.

However, this study is not without limitations. The findings are context-specific and based on a limited number of participants, which may affect their generalizability to broader educational settings. Additionally, the study focuses primarily on teachers' perspectives, without incorporating students' experiences or learning outcomes as complementary data. Future research is therefore recommended to explore digital pedagogical practices across more diverse school contexts and to employ longitudinal approaches in order to examine the sustainability and long-term impact of such practices. Further studies could also integrate multiple stakeholder perspectives to provide a more comprehensive understanding of digital pedagogy in primary education.

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