

## Exploring the Professional Development of Generation Z Teachers: A Qualitative Case Study on Enhancing Digital-Based Learning in Elementary Schools

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**Abstract:** This study explores the development of professionalism among Generation Z (Gen Z) teachers in enhancing the quality of digital-based learning in elementary schools. The research focuses on their adaptability, digital competence, and innovative teaching strategies in the context of rapidly evolving educational practices. Using a qualitative case study design, data were collected through in-depth interviews with Gen Z teachers at SD Muhammadiyah and analyzed to reveal patterns of digital pedagogy. The findings indicate that Gen Z teachers demonstrate strong digital literacy, actively employing interactive presentation applications, online learning platforms, and educational social media to enrich the learning process. Their professionalism is reflected in their commitment to self-directed learning, collaboration with colleagues, and reflective teaching practices. Supporting factors for professional development include institutional support, participation in teacher learning communities, and continuous training opportunities. However, challenges remain, particularly limited school facilities and students' diverse adaptability to digital environments. This study contributes to the discourse on teacher professionalism by emphasizing the pivotal role of Gen Z teachers in advancing digital pedagogy. It concludes that Gen Z teachers possess considerable potential to improve learning quality through digital innovation, yet sustained institutional support is crucial to maximize their impact.

**Keywords:** Teacher Professionalism; Generation Z; Digital Learning; Digital Competence; Instructional Innovation

## INTRODUCTION

The rapid development of digital technology has transformed nearly all aspects of life, including education (Akour & Alenezi, 2022). In the transition from the Industrial Revolution 4.0 to the Society 5.0 era, digital-based learning has become an essential component for achieving effective and relevant education (Ahrofi, 2025). Teachers are no longer merely transmitters of knowledge but serve as facilitators, innovators, and adaptive users of technology

in the learning process (Zhang, 2024). Recent studies emphasize that teacher professionalism must evolve alongside digital transformation to ensure pedagogical relevance in a rapidly changing environment (Anis, 2024).

Currently, the teaching workforce is increasingly dominated by Generation Z (Gen Z) — individuals born between 1997 and 2012 (Isley, 2022). As digital natives, Gen Z teachers tend to possess strong digital literacy and a natural inclination toward technology integration (Hammad, 2025). However, this technological familiarity does not automatically translate into pedagogical competence (Vural, 2025). Studies show that many Gen Z teachers still face challenges in designing innovative, technology-driven learning experiences and aligning digital tools with effective pedagogical frameworks (Quimpan & Bauyot, 2025). According to the TPACK and DigCompEdu frameworks, true digital professionalism requires not only technical ability but also the integration of pedagogical and content knowledge in digital environments (Cid-Martínez et al., 2025).

At the systemic level, several barriers persist. Limited access to educational technology infrastructure, insufficient institutional support, and inconsistent professional training hinder optimal implementation of digital-based learning (Chindomu, 2024). These structural issues exacerbate the gap between policy expectations and classroom realities, especially in developing regions where technological readiness varies significantly (Verawati & Nisrina, 2025). Consequently, digital learning outcomes remain suboptimal despite growing awareness of their importance (Singun, 2025).

Given these circumstances, this study aims to explore the professional development of Gen Z teachers in improving the quality of digital-based learning within the Indonesian context (Swandi et al., 2024). The research focuses on their adaptability, digital competence, and innovative teaching strategies, while also identifying institutional and contextual factors that support or hinder their professionalism (Caena & Vuorikari, 2022). By examining these aspects, this study contributes to the discourse on digital pedagogy and teacher professionalism in the Society 5.0 era (Tavares et al., 2022).

## RESEARCH METHODOLOGY

This research employs a qualitative approach with a case study method to explore the professional development of Generation Z (Gen Z) teachers in digital-based learning at SD Muhammadiyah, Yogyakarta. Five Gen Z teachers aged 23–30 participated in the study, selected purposively based on their active use of digital learning tools. Data were collected through semi-structured, in-depth interviews lasting 45–60 minutes, focusing on digital competence,

professional growth, institutional support, and teaching challenges. The interviews were recorded, transcribed verbatim, and thematically analyzed using Braun and Clarke's (2019) framework. Data validity was ensured through triangulation of interviews, field notes, and documentation. Ethical approval and informed consent were obtained, with all participants' confidentiality maintained.

This study employed a qualitative approach with a case study method conducted at SD Muhammadiyah, Yogyakarta. The research subjects were five Generation Z teachers (aged 23–30) selected purposively based on the following criteria: (1) a minimum of two years of teaching experience, (2) active use of digital technology in classroom instruction, and (3) engagement in technology-based professional development activities. The purposive selection continued until data saturation was achieved, meaning that additional interviews no longer produced new themes.

Data were collected through semi-structured interviews that were recorded and transcribed verbatim. Each informant participated in one main interview session lasting approximately 45–60 minutes; some informants were later engaged in brief follow-up interviews (15–30 minutes) for clarification purposes. The interview protocol included guiding topics but remained flexible to capture rich narratives. Examples of core questions included: (1) "Describe your experience integrating technology into your daily teaching practice," (2) "What training or support has most effectively contributed to your professional growth?", (3) "What challenges have you encountered, and how did you overcome them?", and (4) "How do you assess the impact of technology use on student engagement and learning outcomes?" Informed consent was obtained from all participants, and field notes were taken to record nonverbal cues and classroom observations when possible.

Data analysis followed a multi-layered **thematic analysis** procedure: (1) familiarization with the data through repeated reading of transcripts, (2) initial open coding to capture meaningful units, (3) clustering codes into categories and developing themes through axial/selective coding, and (4) refining and interpreting the themes. Coding was conducted manually and supported by **ATLAS.ti 9** software for data organization, code tracking, and thematic matrix generation. To enhance analytic reliability, two researchers independently coded a sample of transcripts; discrepancies were discussed until consensus was reached. **Validity** was ensured through source triangulation (interviews, school documents, and field notes), **member checking** (confirming findings with participants), and **peer debriefing** with supervisors and methodological experts.

The researcher adopted a **reflexive stance**, explicitly acknowledging positionality as a field researcher with professional connections to several local schools. Potential biases were mitigated through the use of a reflective journal, maintenance of an audit trail, and involvement of external colleagues during the analysis process.

The **limitations** of the study were explicitly noted: as a single-site study with a small sample, its findings have limited transferability to other contexts. The results are context-specific to SD Muhammadiyah and similar schools in comparable environments. To enhance the generalizability and transferability of future research, further **multi-site or complementary quantitative studies** are recommended, involving larger samples and quantitative measures of digital competence.

## RESULTS AND DISCUSSION

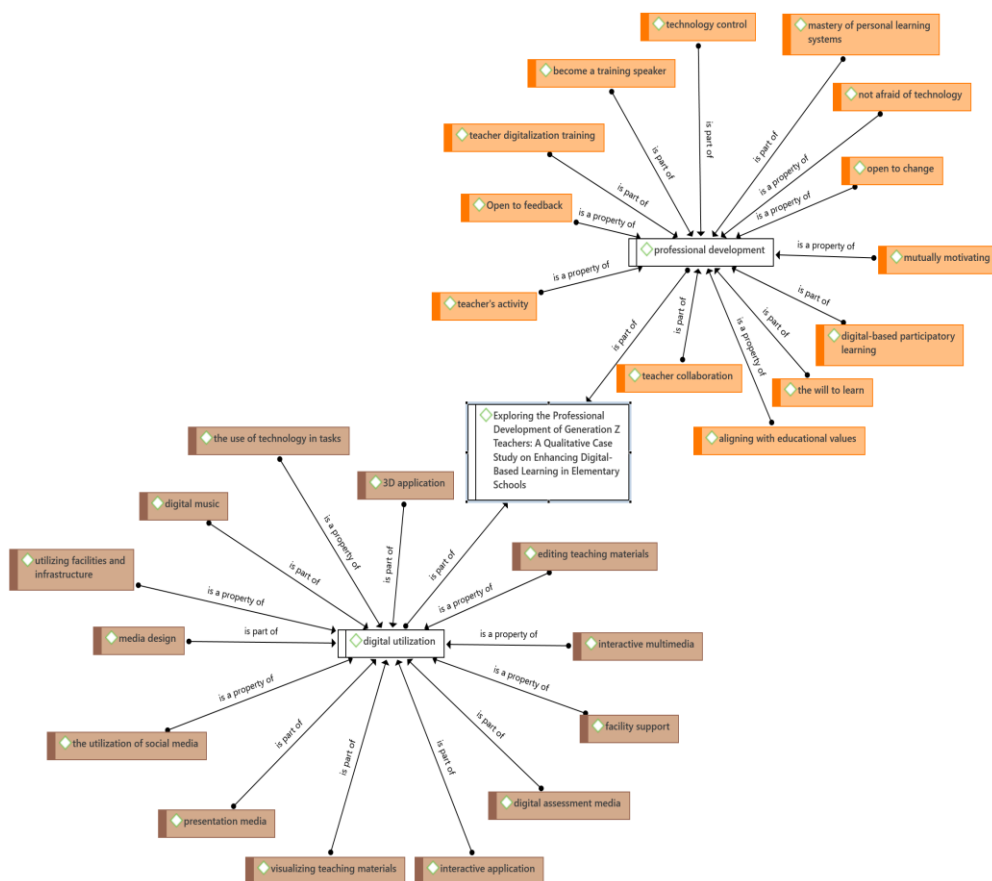


Figure 1. Data Analysis Result Using ATLAS.ti 9

The results of this study show that the professionalism development of Gen Z teachers in improving the quality of digital-based learning consists of two major themes, namely **professionalism development** and **digital utilisation**, each of which has several subcategories as follows:

### **Professionalism Development**

Gen Z teachers demonstrate strong abilities in integrating digital technology into learning. They are not only users but active facilitators. N1 stated, "I make sure students don't just play games when they have laptops; I supervise and give directions on how to use them for learning." N2 added, "I combine digital media with conventional methods to keep students focused." This aligns with TPACK and PCK frameworks that emphasize balance between technology, pedagogy, and content.

Teachers also create personalized learning systems suited to class needs. N2 explained, "I have my own system—usually using Google Classroom—set according to my class rhythm." N3 said, "If there's a new app, I try it first. If it's suitable, I use it in class." These reflect Gen Z teachers' adaptability and innovation in using technology effectively.

Gen Z teachers show flexibility in adjusting to students' learning habits. N4 shared, "Students now prefer videos over books, so I use YouTube and Canva." N5 added, "Every class needs a different digital approach, so we must be flexible." Their openness to new methods shows awareness of student needs and learning styles.

Despite these strengths, several challenges remain. N1 and N3 mentioned limited facilities and unstable internet. N4 added, "Sometimes the projector or Wi-Fi doesn't work properly." These issues highlight the importance of institutional support and continuous digital training for teachers.

The process of motivating each other to try digital learning methods is also evident. N2 explained, "Teacher friends often tell us about good apps, and we help each other in the WhatsApp group." Such collaboration strengthens the climate of cooperation in developing the quality of digital learning.

Digital-based participatory learning is an approach widely used by Gen Z teachers. They encourage students to actively use various creative platforms. N3 stated, "I ask the students to present using Canva or PowerPoint, to make them more active."

A high spirit of learning is also a prominent feature. As N4 said, "I learnt how to edit videos from YouTube so I can create my learning content." This reflects a willingness to continue developing in digital competence.

Although learning is technology-based, educational values and character remain the basis. N5 mentioned, "I make sure the content is educational, not just fun technology." This shows that Gen Z teachers still maintain the essence of education.

In terms of collaboration, Gen Z teachers actively work together across subjects and school levels. N1 revealed, "We once did a thematic project with a science teacher, and I helped with the presentation design aspect." This collaboration enriches learning and broadens the scope of digital integration.

Teachers' activeness is also evident in their habit of seeking information, joining online educational communities, and trying new approaches. N2 stated, "I join webinars every month, sometimes I also join online training from the Ministry of Education and Culture."

Openness to feedback from students, colleagues, and parents is also an important part of professional development. N3 explained, "Children sometimes give me feedback, I listen, then I improve the display."

Participation in digital training is evidence of teachers' commitment to improving competence. N4 said, "The training on making digital teaching media is very helpful, especially the hands-on practice."

Interestingly, some Gen Z teachers have become presenters in digital training for other teachers. As N5 said, "I have been a presenter at Google Workspace training for elementary school teachers in this sub-district." This shows an increase in teachers' professional capacity to the level of sharing knowledge with peers.

### **Digital Utilisation**

Gen Z teachers show adaptive and creative utilisation of technology in supporting the teaching and learning process. They utilise various digital tools to design assignments and assess student learning outcomes efficiently. As expressed by N1, "I make the assignment in Quizizz or Google Form so that I know the grade immediately." This shows the efficient utilisation of digital platforms in learning evaluation.

The infrastructure available at school, such as LCDs, Wi-Fi, and borrowed laptops, is also maximised by teachers. N2 said, "If the network is good, I immediately play learning videos from YouTube." This proves the utilisation of digital media as an alternative learning resource.

To create a conducive classroom atmosphere, some teachers even incorporate digital music elements. N3 explained, "I use instrumental music when the children are writing, so that the atmosphere is calm."

The use of 3D-based applications has also begun, especially in science learning. N4 shared her experience, "We once used a 3D human anatomy application for science class." This indicates the courage to explore more complex interactive media.

Gen Z teachers also have the skills to edit teaching materials independently. N5 revealed, "I edit the video myself, use CapCut, and then upload it to private YouTube." This independence shows mastery of learning content production technology.

In everyday learning, interactive multimedia is widely used to enhance the attractiveness of the material. N1 stated, "I combine videos, interactive questions, and simple games using Wordwall." With this approach, teachers are able to present the material in a more interesting and fun way.

The ability to utilise digital is also supported by school facilities and personal equipment. N2 mentioned, "Fortunately, there is a projector from the school, so I can present more interestingly."

Gen Z teachers actively incorporate digital platforms in both formative and summative assessments. N3 mentioned, "I make daily assessments in Google Form; the scores come out immediately." This efficiency demonstrates how technology supports real-time feedback and data-driven decision-making in classrooms.

Interactive tools such as Canva, Kahoot, and Live Worksheets are widely used to increase student engagement. N4 shared, "Children are more enthusiastic if the assignment uses Kahoot." This aligns with digital pedagogy principles, emphasizing active learning through gamification and visual interactivity.

Visual presentation is also a central focus. N5 said, "I make my infographics to introduce new themes every week," while N1 added, "I design slides myself, so it's not boring." Such creativity reflects professional digital competence and aligns with teacher professionalism theory that values innovation and communication clarity.

Social media is used as a creative platform for documentation and student appreciation. N2 explained, "We upload children's assignments on the class Instagram as documentation." Meanwhile, N3 emphasized, "I use Canva to make interesting learning posters or worksheets." These practices illustrate Gen Z teachers' ability to merge technology, pedagogy, and creativity, though sustainability remains a challenge without ongoing institutional support.

## DISCUSSION

### **Professionalism Development of Gen Z Teachers in Improving the Quality of Digital-Based Learning**

The professional development of Gen Z teachers in digital-based learning requires the integration of pedagogical competence, technological literacy, and adaptability to change (Mukhlisa et al., 2025). As digital natives, Gen Z teachers tend to be more receptive to new technologies and innovative learning methods (Quimpan & Bauyot, 2025). Their professionalism is therefore not only measured by technical mastery but also by collaborative ability, reflective practice, and a sustained willingness to learn (Aris et al., 2022).

A key indicator of Gen Z teachers' professionalism lies in their competence to design and manage digital learning environments effectively (Isley, 2022). They can operate various technological tools while maintaining instructional quality and learner engagement (Veluvali & Suriseti, 2022). This ability is reinforced by a positive disposition toward experimentation and openness to educational innovation (Bubou & Job, 2022).

To deepen the theoretical grounding, future analyses should engage more critically with frameworks such as Technological Pedagogical Content Knowledge (TPACK) and Professional Learning Community (PLC) theory (Meletiyou-Mavrotheris & Paparistodemou, 2024). These perspectives could help synthesise the relationship between digital competence, professional identity, and continuous improvement, providing a more holistic understanding of Gen Z teachers' professional development (Binabise et al., 2024).

Collaboration between teachers is also an important part of professional development (Bergmark, 2023). Through good cooperation, teachers can share best practices, motivate each other, and create a more innovative and adaptive learning ecosystem (SWARGIARY, 2025). This collaboration is not only limited to informal discussions, but also structured in professional forums such as learning communities or in-school training (Irby et al., 2023).

Furthermore, Gen Z teachers show a high willingness to learn to keep up with the latest technology and learning approaches (Khan et al., 2024). Their openness to feedback and change makes them more flexible in developing learning strategies that are relevant to the needs of today's learners (Rajaram, 2023).

Finally, the professional development of Gen Z teachers is also directed to align digital competencies with educational values (Binabise et al., 2024). This means that technology is used not merely for sophistication, but to support meaningful and ethical learning (Sætra & Danaher, 2022). This reflects a long-

term orientation that teacher professionalism is not only technical, but also touches on the moral and social aspects of education (Nissilä et al., 2022).

### **Gen Z Teachers' Digital Utilisation in Improving the Quality of Digital-based Learning**

Gen Z teachers utilise digital technology as the primary means to improve effectiveness, efficiency, and student engagement in the learning process (Cain et al., 2022). This digital utilisation includes the use of various hardware and software, such as computers, laptops, LCD projectors, smartphones, and learning applications such as Canva, Google Classroom, Quizziz, and WhatsApp as communication media and learning instruments (Putra et al., 2024).

The use of digital platforms by Gen Z teachers indicates a transition from conventional learning models to more interactive, flexible, and student-centred learning models (Mayildurai et al., 2024). For example, teachers can create more visually appealing learning designs with Canva, organise online quiz-based evaluations, and facilitate discussions through social media or online groups. This indirectly increases students' interest and motivation in learning.

In this context, Gen Z teachers not only act as material deliverers but also as facilitators who utilise technology to manage classes, assess learning outcomes, and provide real-time feedback (Regmi, 2024). The accessibility of technology allows teachers to tailor learning materials to students' needs in a more personalised and adaptive way (Sigalla & Kimario, 2025).

The utilisation of digital technology also encourages project-based learning approaches and online collaboration, which enrich students' learning experience (Mabe et al., 2022). Gen Z teachers tend to encourage students to actively seek information, complete group tasks through online platforms, and present the results creatively. These activities not only shape academic skills, but also 21st-century skills such as critical thinking, communication, collaboration, and digital literacy.

However, the utilisation of digital technology by Gen Z teachers still requires careful planning and strong pedagogical mastery. Technology is not the end goal, but rather a tool to achieve more meaningful learning goals (Yu, 2023). Therefore, teachers need to be able to develop learning designs that are relevant, inclusive, and still consider student characteristics and the availability of facilities and infrastructure (Debasu & Yitayew, 2024).

Overall, Gen Z teachers' use of digital learning has contributed to positive transformations in the basic education system (Lesinskis et al., 2023). With their spirit of innovation and technological capabilities, Gen Z teachers

have the potential to be a motor of change in creating quality and relevant learning for the times (Binabise et al., 2024).

## CONCLUSION

The professional development of Gen Z teachers in digital-based learning reflects a shift toward adaptive and innovative education. The findings show that teachers enhance collaboration, creativity, and digital practices through platforms like Google Classroom, Canva, and Quizizz. This supports constructivist and connectivist learning theories that emphasise interaction and learner autonomy. The study also reveals challenges such as limited infrastructure, inconsistent institutional support, and uneven digital competence among teachers. These issues highlight the need for continuous professional training and sustainable digital ecosystems within schools. Practical models such as peer mentoring and blended workshops could strengthen teachers' digital professionalism. However, this research is limited to a single case study with a small, localised sample, which may restrict broader generalisation. Future studies could conduct comparative analyses across regions or explore longitudinal developments of Gen Z teachers' digital competencies. Institutional policy alignment and investment in digital literacy also warrant further investigation.

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