

Professional learning community model in improving teachers' pedagogical competence to face Alpha generation

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Abstract

This study examines how the Professional Learning Community (PLC) enhances teachers' pedagogical competence in addressing the learning characteristics of Generation Alpha. Employing a qualitative case study design, the research was conducted in two vocational schools in Aceh Jaya involving 13 participants, including principals, teachers, and a supervisor. Data were collected through in-depth interviews, participatory observation, and documentation and analyzed using thematic analysis with triangulation to ensure trustworthiness. The findings reveal that PLC fosters collaborative learning, reflective practice, and technology integration, which contribute to improved instructional strategies, digital literacy, and teacher confidence. Furthermore, PLC transforms professional practices from administrative routines into continuous, reflective, and student-centered learning processes. This study highlights PLC as an effective and sustainable model for strengthening pedagogical competence and supporting educational transformation in the context of Society 5.0.

Keywords

Generation Alpha, pedagogical competence, professional learning community, qualitative case study, vocational education

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Introduction

The rapid changes in technology and social interaction for the new generation are referred to as Generation Alpha. This generation has grown up in a digital environment since early childhood, resulting in different ways of learning, interacting, and thinking compared to previous generations (Komariah & Kurniady, 2022). This phenomenon requires teachers not only to act as teachers but also to serve as guides who can provide appropriate and adaptive learning. Therefore, improving teachers' teaching skills is urgent and cannot be delayed. Teachers need to actively adjust their teaching methods so that this generation understands them well, incorporating strategies that leverage technology and foster engagement, such as interactive activities and personalised learning experiences. The application of the latest learning technologies, such as interactive digital platforms, data-driven systems, and virtual collaboration, is an important step for teachers in engaging Generation Alpha. The integration of technology with human values can be realized through PLC, which encourages learning innovation and shapes a digitally savvy and characterful Generation Alpha (Apandi et al., 2025; Fukuyama, 2018; Musman et al., 2024).

Several studies indicate that educational ability is an important factor in the success of the learning process. At the same time, Professional Learning Communities (PLCs) (Komariah & Kurniady, 2022) have been proven to improve teaching quality through cooperation and collaboration, reflection, and continuous, sustainable development (DuFour & Eaker, 2009; Rusnali, 2021; Shirley et al., 2010; Stoll et al., 2006). However, very few studies link PLCs to teacher preparation for Generation Alpha, even though this generation has a more interactive, collaborative, and analytical learning style (Komariah & Kurniady, 2022; Pandian et al., 2022). Recent research emphasizes the importance of digital skills for teachers (Falloon, 2020). In line with Fukuyama's (2018) concept of Society 5.0, the integration of technology and human values is fundamental, making PLC a relevant approach for strengthening teachers' pedagogical skills in the digital age.

A Professional Learning Community (PLC) is a method for developing teacher professionalism that emphasizes teacher cooperation, with full support from the school. In its implementation, PLC is considered a group of active learners who exchange experiences, engage in reflective discussions, and develop shared learning visions and goals (Aslam et al., 2023; DuFour & Eaker, 2009; Hudson, 2024; Linh & Kasule, 2022). The theoretical basis of PLC stems from professional collaboration, teacher competency improvement, and organizational change theory that emphasizes the importance of a responsive school culture. Key elements of PLC include collaborative leadership, shared vision and values, cooperation, reflection, and supporting factors such as time, resources, and evaluation culture. Previous research has shown that these factors significantly impact teachers' professional development. In addition, research by Affandi et al. (2019) confirms that resource support and opportunities for collaboration strongly influence PLC effectiveness. Rečs and Geske (2019) emphasize the importance of critical exchange of ideas to create learning strategies appropriate for Generation Alpha.

The emerging evidence from recent studies further strengthens the argument that teachers' pedagogical competence and digital readiness must be developed in a structured and collaborative manner. As demonstrated by Andre et al. (2025), the successful integration of technological tools into classroom practices is closely linked to the quality of teachers'

pedagogical skills, particularly in the design of learning experiences that stimulate creativity and student engagement. Likewise, [Amin et al. \(2025\)](#) emphasize that pedagogical competence—including planning, implementation, and classroom management—remains a decisive factor in determining learning outcomes, underscoring the need for continuous support to overcome recurring instructional challenges. These insights reinforce the urgency of implementing systematic professional development models such as PLCs, which promote collective learning and provide continuous opportunities for teachers to refine instructional practices, enhance digital literacy, and respond to the evolving characteristics of Generation Alpha. Thus, the limited research integrating PLC with the specific learning needs of Generation Alpha underscores the importance of this study and the contribution it aims to provide for advancing pedagogical innovation in vocational education.

Conceptually, Generation Alpha refers to individuals born from 2009/2010 onwards who have grown up in a highly advanced, technologically innovative virtual environment. ([Komariah & Kurniady, 2022](#); [McCrindle & Wolfinger, 2018](#); [Rusnali, 2021](#); [Stoll et al., 2006](#)). This generation is the first to be born entirely in the virtual era and has a close attachment to technological devices, so they are often described as virtual natives. The unique characteristics of Generation Alpha include their tendency to use gadgets in daily activities, their ability to multitask, and their preference for learning models that are more visual, interactive, and experience-based ([Sabila et al., 2024](#)). [Amanah et al. \(2025\)](#) emphasize that learning for this generation requires a more innovative and adaptive pedagogical approach to accommodate their critical and creative thinking. Therefore, educational strategies designed for Generation Alpha need to be personalized, flexible, and context-specific to address their complex and dynamic learning needs.

Nonetheless, investigations into the implementation of the Professional Learning Community (PLC) model that specifically amalgamates teachers' pedagogical skills with the traits of Generation Alpha in Indonesian vocational schools remain scarce and have not been extensively examined. The novelty of this research lies in the development of a PLC model grounded in reflective collaboration and digital literacy to strengthen teachers' pedagogical competencies in addressing Generation Alpha in the era of Society 5.0. The initial hypothesis of this study states that PLC is an effective structure for addressing the challenges of 21st-century education, particularly in interacting with Generation Alpha, who grew up in the digital era. Through collaboration, joint reflection, and practices oriented to students' needs, PLC is believed to be able to improve teachers' pedagogical competencies while encouraging relevant learning innovations. [Linh and Kasule \(2022\)](#) emphasize that strengthening teachers' skills through professional collaboration significantly improves the quality of learning. Thus, this study provides theoretical and practical contributions: theoretically, it expands the understanding of the effectiveness of PLCs in the context of Generation Alpha education, and practically, it offers guidance for teachers and schools in building an adaptive, collaborative, and relevant learning ecosystem in line with the demands of the digital transformation era.

Literature Review

Professional learning community (PLC)

A Professional Learning Community (PLC) is a model for developing teachers' professionalism that emphasizes collaboration among educators with full institutional support.

In its implementation, PLC is viewed as an active learning group that exchanges experiences, engages in reflective discussions, and builds a shared vision and learning goals (Aslam et al., 2023; DuFour & Eaker, 2009; Hudson, 2024; Linh & Kasule, 2022). The theoretical basis of PLC derives from professional collaboration, teacher capacity-building, and organizational change theory, all of which highlight the importance of a responsive school culture.

Key elements of PLC include collaborative leadership, shared vision and values, teamwork, reflection, and supporting factors such as time, resources, and evaluation culture. Previous studies have established that these factors substantially affect teachers' professional development. Affandi et al. (2019) emphasized that PLC effectiveness depends heavily on resource availability and opportunities for collaboration, while Rečs and Geske (2019) underscored the value of critical idea exchange in designing learning strategies suitable for Generation Alpha.

Beyond strengthening teacher professionalism, PLCs also transform teaching practices from individualistic to collaborative and reflective, placing students at the center of learning. Sanchez (2018) noted that "transformational learning within a PLC occurs when educators engage in critical reflection, experiential sharing, and strategic planning." Similarly, Rečs and Geske (2019) affirmed that "teachers actively involved in PLCs enhance their professional competence while contributing to improved student outcomes." Andre et al. (2025) further reinforced that pedagogically skilled teachers within collaborative digital environments are better able to foster creativity and engagement among students, demonstrating the synergy between pedagogical competence and technology integration, which is essential for adapting teaching methods to meet the needs of diverse learners. Thus, PLC becomes a crucial instrument for creating adaptive learning that balances technological advancement with humanistic values in line with the Society 5.0 vision.

Pedagogical competence

The conceptualization of pedagogical competence highlights teachers' strategic role in understanding, designing, implementing, and evaluating learning processes that meet students' needs. Law No. 14 of 2005 on Teachers and Lecturers explicitly defines pedagogical competence as encompassing an understanding of student characteristics, mastery of learning theories, the ability to design instructional strategies, and the skill to assess learning outcomes. Anggraeni et al. (2025) emphasized that pedagogical competence forms the foundation of effective teaching because it directly relates to teachers' capacity to understand learners' potential. Amin et al. (2025) confirmed that teachers' ability to comprehensively plan, implement, and evaluate learning activities reflects their pedagogical expertise. However, challenges remain in classroom management and in consistently applying reflective practice, which can hinder the overall effectiveness of teaching and learning outcomes. They also observed that teachers who integrate ICT into their lessons succeed in stimulating student motivation and participation, proving that pedagogical and technological literacy must coexist in modern education.

Likewise, Kashah (2023) asserted that teachers with strong pedagogical competence can design innovative learning experiences that foster student independence, which is essential for adapting to learners' diverse needs in a technology-rich environment. Consequently, pedagogical competence is not merely a normative obligation but also a transformative foundation for student-centered learning in the digital era.

In operational terms, pedagogical competence can be described through four key aspects: understanding learners, planning instruction, implementing learning, and evaluating outcomes. Each aspect can be assessed through specific indicators—for instance, using methods suited to students' learning styles, designing lesson plans based on learners' needs, managing classrooms effectively, and applying authentic assessment tools. Amanah et al. (2025) highlighted that teachers' ability to choose relevant strategies determines the achievement of learner-centered goals, while Nafisah et al. (2025) stressed the need for contextual and authentic evaluation as a vital component of continuous professional growth.

Based on these findings, Andre et al. (2025) demonstrated that integrating teachers' pedagogical skills with digital competence can substantially boost creativity and engagement. In contrast, Amin et al. (2025) emphasized reflective practice and consistent evaluation as pathways to improving instructional quality. Together, these studies demonstrate that pedagogical competence is multidimensional, integrating knowledge, reflection, and innovation to meet the complex demands of the digital-native Generation Alpha.

Generation Alpha

Generation Alpha refers to individuals born from 2009/2010 onwards who have grown up in a digitally saturated environment (Komariah & Kurniady, 2022; McCrindle & Wolfinger, 2018; Rusnali, 2021; Stoll et al., 2006). They are the first generation to be born into the digital age, and they are very attached to technology. People often call them "virtual natives." Their characteristics include extensive device use, multitasking, and a preference for visual, interactive, and experiential learning. Mulyasa (2021) argued that teaching this generation requires innovative and adaptive pedagogical approaches that accommodate their critical and creative thinking styles.

Educational strategies for Generation Alpha should therefore be personalized, flexible, and contextual to address their complex learning needs. Zainuddin & Keumala (2024) recommended integrating technology with humanistic approaches to balance digital literacy, emotional intelligence, and social skills. The pedagogical competencies discussed earlier—especially technological adaptability and reflective practice as highlighted by Amin et al. (2025) and Andre et al. (2025) are thus essential foundations for engaging this generation meaningfully in twenty-first-century education.

Research Methodology

Research design

This study employed a qualitative case study design to explore how the Professional Learning Community (PLC) model enhances teachers' pedagogical competence in addressing the learning characteristics of Generation Alpha. The case study approach was selected because it allows for an in-depth understanding of complex educational practices within their real-life context. This design is particularly appropriate for examining collaborative professional development processes such as PLC, which involve continuous interaction, reflection, and contextual adaptation within school environments. Through this approach, the study aims to capture authentic experiences and provide a comprehensive understanding of how PLC contributes to pedagogical improvement.

Research site and participants

The research was conducted at two public vocational schools in Aceh Jaya, Indonesia, namely SMK Negeri 1 Calang and SMK Negeri 1 Teunom. The study took place over three months, from May to July 2025, allowing sufficient time to observe ongoing PLC activities and their impact on teaching practices. A total of 13 participants were selected using purposive sampling based on their active involvement in PLC implementation. The participants consisted of school principals, vice principals, teachers, and a school supervisor. This selection was intended to capture diverse perspectives, including leadership roles, instructional practices, and supervisory insights, thereby ensuring a comprehensive understanding of PLC implementation in the school context.

Data collection techniques

Data were collected through in-depth interviews, participatory observation, and document analysis to ensure richness and data triangulation. In-depth interviews were conducted using a semi-structured format, allowing participants to express their experiences and perceptions of PLC activities freely. The interviews lasted about 30 to 60 minutes and focused on important topics like teaching methods, working together to learn, and using digital tools in the classroom.

In addition, participatory observation was carried out during PLC sessions, including collaborative lesson planning, reflective discussions, workshops, and training activities. These observations enabled the researcher to directly examine interactions, behaviors, and teaching practices in natural settings. Field notes were recorded to document significant events and patterns observed during the activities.

Documentation analysis was also conducted to complement the data obtained from interviews and observations. The documents analyzed included meeting notes, lesson plans, teaching materials, and records of digital learning activities. These sources were used to validate and enrich the findings, providing additional evidence of PLC practices and their impact on pedagogical competence.

Data analysis

The data were analyzed using thematic analysis, a process involving several interconnected stages. The process began with data reduction, where relevant information was selected and organized from the collected data. This was followed by coding, in which meaningful units of data were identified and labeled. The codes were then grouped into broader categories to form themes that reflected key patterns in the data. Finally, the themes were interpreted by linking them to the research objectives and relevant theoretical frameworks.

The analysis focused on identifying patterns related to teachers' pedagogical competence, collaborative practices within PLC, the integration of digital literacy, and instructional innovation. The process was conducted iteratively, allowing the researcher to revisit the data multiple times to ensure depth, consistency, and accuracy of interpretation.

Trustworthiness of data

To ensure the credibility and reliability of the findings, several strategies were employed. Data triangulation was applied by comparing information obtained from interviews, observations, and documentation. This approach helped confirm the consistency of the findings across different data sources. In addition, member checking was conducted by sharing summaries of the findings with participants to confirm the accuracy of interpretations. Peer debriefing was also carried out through discussions with academic supervisors, providing external validation and minimizing potential bias. These techniques ensured that the study met the standards of credibility, dependability, and confirmability in qualitative research.

Ethical considerations

Ethical principles were carefully observed throughout the research process. All participants provided informed consent prior to data collection and were informed of the study's purpose. Their identities were kept confidential through the use of pseudonyms to protect their privacy. Participation was voluntary, and participants had the right to withdraw from the study at any time. All data were used solely for academic purposes and handled with strict confidentiality.

Findings and Discussion

The findings of this study address the research objective of examining how the Professional Learning Community (PLC) model enhances teachers' pedagogical competence in responding to the learning characteristics of Generation Alpha. The results are organized into three major themes derived from thematic analysis, supported by direct quotations, tables, and visual documentation.

Construction of the professional learning community model

The first theme highlights how the PLC model is constructed and implemented within the school context. The findings indicate that PLC is structured through regular collaborative meetings, reflective discussions, and experience-sharing sessions. These activities function as a professional space where teachers collectively address instructional challenges and develop innovative teaching strategies. Participants emphasized that PLC has shifted the nature of professional meetings from administrative routines to reflective and problem-solving practices. One participant stated:

“Through PLC, I gained new ideas from colleagues on how to teach Generation Alpha students who easily lose focus. The discussions moved beyond administrative matters toward reflection and digital-based learning innovations.” (Informant 5, teacher, age 40)

This statement indicates that PLC fosters a transition toward reflective professional culture, where teachers actively construct knowledge through collaboration. The findings further show

that leadership support, shared vision, and digital integration are central components of PLC implementation.

Table 1. *Themes and sub-themes*

Themes	Sub-Themes
Theme one: construction of the professional learning community model	Collaborative leadership, shared vision and reflection, digital integration, professional transformation
Theme two: strengthening teachers' pedagogical competence for Generation Alpha	Student-centered instruction, differentiated learning, blended learning, classroom innovation
Theme three: integration of technology and human values in society 5.0 era	Digital literacy, innovation and creativity, human-centered learning, cultural and moral integration

The table shows that PLC is not limited to organizational structure but operates as a transformative mechanism that connects leadership, collaboration, and pedagogical development. This suggests that the effectiveness of PLC depends on both structural support and active teacher engagement.

Strengthening pedagogical competence to face Generation Alpha

The second theme focuses on how PLC contributes to improving teachers' pedagogical competence. The findings reveal that participation in PLC activities encourages teachers to adopt more interactive, student-centered, and technology-integrated instructional approaches. Teachers reported that activities such as peer mentoring, collaborative lesson planning, and reflective discussions played a significant role in enhancing their instructional practices. These activities enabled teachers to adapt their teaching strategies to the characteristics of Generation Alpha, who prefer visual, interactive, and digital learning environments.

Table 2. *Examples of PLC practices observed*

Activity Types	Examples	Focus Areas
Peer mentoring	Teachers observing each other's lessons and providing feedback	Reflective practice
Workshop sessions	Digital learning design and interactive media use	Integration of ICT in pedagogy
Collaborative lesson study	Planning and reviewing blended learning sessions	Differentiated instruction
PLC webinars	"Implementing Positive Discipline" and "Sharing Good Practices"	Character-based education

The findings indicate that these practices contribute to increased teacher confidence, creativity, and digital literacy. One participant explained:

“PLC encourages me to integrate technology, such as online games and visual simulations, to make lessons more interactive for digital-native students.” (Informant 7, teacher, age 34)

This reflects that PLC supports pedagogical transformation by enabling teachers to move from traditional teaching methods to more adaptive and engaging instructional practices. The consistent use of reflection within PLC activities also strengthens teachers’ ability to evaluate and improve their teaching, leading to enhanced student engagement and learning outcomes.

Figure 1. Online PLC webinar



Online PLC activity in the form of a webinar on “The Implementation of Positive Discipline.”
Online PLC activity in the form of a webinar on “Sharing Best Practices.”
(Source: PLC documentation archives, 2025)

Figure 2. Workshop activity: Collaborative lesson design



(Source: PLC documentation archives, 2025)

Figure 3. *Group discussion on plc planning*



(Source: PLC documentation archives, 2025)

The figures illustrate that PLC activities are conducted both online and offline, demonstrating flexibility in professional development. These activities provide continuous opportunities for teachers to engage in collaborative learning and innovation.

Integration of technology and human values in society 5.0 era

The third theme examines how teachers integrate technology with humanistic values in their teaching practices. The findings show that teachers do not only use digital tools to enhance learning but also incorporate moral and social values into their instructional design, such as promoting collaboration, empathy, and critical thinking among students.

Figure 4. *Technology-based classroom activities*



Chemistry Learning using Digital Simulations (TikTok link)

Differentiated Instruction with YouTube-Based Learning

Collaborative Classroom Discussion

(Source: PLC documentation archives, 2025)

The findings indicate that teachers act as facilitators who balance technological innovation with character education. This approach ensures that learning is not only technologically advanced but also socially meaningful. One participant stated:

“Integrating technology is not just about using gadgets—it’s about shaping creative and ethical learners who understand the value of collaboration and respect.” (Informant 9, supervisor, age 44)

This statement demonstrates that PLC supports a holistic approach to education, combining digital competence with human values. The integration of these elements aligns with the concept of Society 5.0, where technology serves human development. The findings reveal three key dimensions of the PLC model in enhancing teachers' pedagogical competence. First, PLC fosters a collaborative and reflective culture that promotes shared learning and professional growth. Second, PLCs strengthen teachers' pedagogical and digital competencies by encouraging innovative, student-centered instructional practices. Third, PLC supports integrating technology with human values, enabling teachers to design learning that is both technologically relevant and socially meaningful, which is essential for engaging Generation Alpha students who are digital natives and value social responsibility.

Overall, the results indicate that PLCs function as dynamic, sustainable professional development models that enhance teachers' readiness to meet the learning needs of Generation Alpha. The results of this study demonstrate that implementing the Professional Learning Community (PLC) model significantly improves teachers' pedagogical competence, particularly in responding to the challenges posed by Generation Alpha. These findings are consistent with previous studies emphasizing the importance of collaboration, reflection, and continuous professional development among educators (DuFour & Eaker, 2009; Hord, 2004; Stoll et al., 2006). More recent studies further reinforce this perspective, highlighting that collaborative professional learning environments enhance instructional quality and teacher adaptability in digital contexts (Cattaneo et al., 2022). In this study, the vocational education setting adds an important dimension, as teachers are required to integrate both pedagogical and practical competencies aligned with industry demands, which is crucial for preparing students for real-world challenges and ensuring that educational practices meet current labour market needs.

The first key finding indicates that PLC fosters a culture of collaboration and shared responsibility among teachers. This aligns with DuFour and Eaker (2009), who argue that PLC creates a professional environment in which educators work collectively toward shared learning goals. In this study, teachers reported that PLC meetings provided opportunities to exchange ideas, co-design lesson plans, and address classroom challenges together. These collaborative practices go beyond formal requirements and support meaningful professional learning. Recent research also suggests that collaborative cultures in schools significantly influence teachers' willingness to innovate and adopt new teaching strategies (Fuad et al., 2022). This indicates that PLC supports professional interaction and promotes a culture of continuous improvement.

The second finding shows that PLC encourages teachers to engage in reflective practice. This supports Hord's (2004) perspective that reflection and shared dialogue are central to effective professional learning communities. Through ongoing reflection, teachers became more aware of their instructional strengths and areas for improvement. More importantly,

reflection enabled them to adjust their teaching strategies to meet better the needs of Generation Alpha students, who tend to prefer interactive, technology-supported learning environments. This finding is consistent with McGarr and Johnston (2019), who emphasize that reflective practice is essential for sustainable professional development. In this study, reflection serves both as an evaluative instrument and as a catalyst for pedagogical transformation.

Another important aspect highlighted in this study is the integration of digital literacy within the PLC framework. Teachers reported increased use of digital tools such as Canva, Quizizz, and YouTube to support more engaging and interactive learning. This finding is consistent with Andre et al. (2025), who emphasize that the combination of pedagogical and technological competencies enhances student engagement and creativity. Furthermore, studies by Serrano et al. (2019) show that technology-supported learning environments significantly improve student participation and learning outcomes. However, this study adds that digital integration is more effective when developed collaboratively within PLC, as peer support helps teachers overcome technological barriers and build confidence in using digital tools, ultimately leading to improved teaching practices and enhanced student learning experiences.

In addition, the findings indicate that PLC activities support a balance between technological integration and humanistic values in education. This aligns with Fukuyama's (2018) concept of Society 5.0, which emphasizes the role of technology in enhancing human well-being. Teachers in this study not only integrated digital tools into their teaching but also emphasized values such as empathy, responsibility, and cultural awareness. This aligns with recent findings by Jones et al. (2013), who argue that educational technology should be used to promote holistic development rather than purely technical skills. Therefore, PLC (Professional Learning Community) can be seen as a platform that bridges technological advancement with value-based education.

Finally, this study emphasises both theoretical and practical contributions. From a theoretical perspective, the findings reinforce social constructivist views that knowledge is developed through interaction and collaboration. The study also extends the concept of PLC by demonstrating its relevance in supporting digital pedagogical transformation in vocational education contexts. From a practical perspective, the findings suggest that PLCs can serve as a sustainable, contextually relevant model for teacher professional development. This is particularly important in the context of rapid educational change, where teachers must continuously adapt to new technologies and student characteristics. As noted by Mozelius et al. (2024) continuous professional learning is essential for maintaining educational quality in the digital era. Through continuous collaboration, reflection, and innovation, PLC enables schools to prepare teachers better to meet the learning needs of Generation Alpha in an increasingly complex educational environment.

Conclusion

The results of this study confirm that the Professional Learning Community (PLC) model plays a significant role in enhancing teachers' pedagogical competence and their readiness to address the learning characteristics of Generation Alpha. The implementation of PLC in vocational schools in Aceh Jaya has fostered a culture of collaboration, reflective dialogue, and instructional innovation. Through sustained engagement in PLC activities, teachers have integrated digital literacy into lesson design, improved classroom management,

and adopted more student-centered pedagogical approaches aligned with 21st-century learning principles.

From a theoretical perspective, these findings reinforce constructivist and collaborative learning frameworks. The study demonstrates that interaction and shared experiences within a professional learning community construct knowledge, aligning with Vygotsky's social constructivism. This also supports Hord's (2004) view that reflective dialogue and shared practice within PLCs contribute to continuous professional growth. Furthermore, the findings extend recent studies (Andre et al., 2025; Amin et al., 2025) by showing that pedagogical competence develops more effectively when collaboration, reflection, and digital integration are embedded within everyday teaching practices.

From a practical perspective, this study highlights that PLC serves as a sustainable and contextually relevant model for teacher professional development, particularly in vocational education settings. The findings indicate that teachers improve their instructional strategies and develop the ability to balance technological innovation with humanistic and ethical values. This is especially important in preparing students to become responsible and adaptive learners in the Society 5.0 era. However, this study is limited to a specific context involving a relatively small number of participants in two vocational schools, which may limit the generalizability of the findings.

Recommendation

Based on the findings of this study, several recommendations can be proposed to strengthen the implementation of the Professional Learning Community (PLC) model in educational settings. Schools are encouraged to provide stronger institutional support by formally integrating PLC activities into their professional development systems. This includes allocating dedicated time, providing appropriate facilities, and ensuring consistent leadership support to sustain collaborative learning practices among teachers.

In addition, continuous professional development programs should emphasize integrating pedagogy and technology to enhance teachers' capacity to design creative, interactive learning experiences. Teachers should be encouraged to actively participate in reflective dialogue and collaborative problem-solving within PLC activities, as these practices have been shown to support continuous instructional improvement.

At the policy level, educational authorities may consider incorporating PLC-based professional development into broader teacher evaluation and certification frameworks. Such integration can ensure that collaborative and reflective practices become a core component of teacher professionalism.

Finally, future research is recommended to explore the long-term impact of PLC implementation across diverse educational contexts. Further studies may also examine the relationship between PLC participation and student learning outcomes using different methodological approaches to provide a more comprehensive understanding of its effectiveness.

Disclosure Statement

No potential conflict of interest was reported by the authors.

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