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Enhancing Digital Competencies in Education: A Comprehensive Framework for Teacher Training and Leadership

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Abstract:

The development of digital platform-based education requires teachers not only to master technology but also to design interactive, contextual, and pedagogically valuable digital learning experiences. This study aims to create a digital training framework to accelerate the professional growth of Islamic Religious Education teachers by integrating TPACK and Four-D. This study uses a qualitative case study approach. Data were collected through training observations, in-depth interviews, and documentation, then analyzed interactively. The results show that the increase in data-based competencies includes Canva media creation (85%), PowerPoint presentations (81%), Wordwall and Quizizz digital assessments (78%), Padlet collaboration (74%), Google Classroom class management (72%), and digital teaching simulations (69%). This study develops a Digital Training Leadership Framework grounded in practice, collaboration, digital projects, and the dissemination of teacher work, as a new contribution. The implications of this study recommend designing digital training based on dominant practices, continuous mentoring, and peer mentoring to strengthen the digital learning Leadership of Islamic Religious Education teachers.

Keywords: *Digital Training; TPACK; Four-D Model; Digital Leadership*

Abstrak:

Perkembangan pendidikan berbasis platform digital menuntut guru tidak hanya menguasai teknologi tetapi juga mampu merancang pembelajaran digital yang interaktif, kontekstual, dan bernilai pedagogis. Penelitian ini bertujuan merancang kerangka kerja pelatihan digital untuk mempercepat pertumbuhan profesional guru Pendidikan Agama Islam berbasis integrasi TPACK dan Four-D. Penelitian ini menggunakan pendekatan kualitatif jenis studi kasus. Data dikumpulkan melalui observasi pelatihan, wawancara mendalam, dan dokumentasi, kemudian dianalisis secara interaktif. Hasil penelitian menunjukkan bahwa peningkatan kompetensi berbasis data, meliputi pembuatan media Canva (85%), presentasi PowerPoint (81%), penilaian digital Wordwall dan Quizizz (78%), kolaborasi Padlet (74%), manajemen kelas Google Classroom (72%), dan simulasi pengajaran digital (69%). Penelitian ini menghasilkan Kerangka Kerja Kepemimpinan Pelatihan Digital berbasis praktik, kolaborasi, proyek digital, dan diseminasi karya guru sebagai kontribusi baru. Implikasi penelitian ini merekomendasikan perancangan pelatihan digital berbasis praktik dominan, pendampingan berkelanjutan, dan

pendampingan sebaya untuk memperkuat kepemimpinan pembelajaran digital guru Pendidikan Agama Islam.
Kata Kunci: *Pelatihan Digital; TPACK; Model Four-D; Kepemimpinan Digital*

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INTRODUCTION

The development of digital technology in education has created new demands on the professional competence of teachers at all levels of education, including Islamic Religious Education (PAI) teachers. Today's society expects digital platform-based learning processes with an interactive, multimodal approach, while still representing Islamic values in their entirety (Pavlenko et al., 2023; Şahin Kölemen, 2024; Wang & Li, 2024). These social changes require teachers to master not only religious material but also digital pedagogy and the ability to design innovative learning. When teachers fail to integrate technology harmoniously with content and pedagogy, PAI learning loses relevance, student engagement, and the quality of value internalization (Alavi et al., 2024; Junaida et al., 2024; Veiga, 2021). Therefore, efforts to strengthen the digital competence of PAI teachers are not merely a technical need, but a strategic societal imperative to ensure the sustainability of quality religious education in the digital era.

Although technology integration in education has become a national priority, teacher training tends to focus on technical mastery of digital applications, rather than on digital learning design that supports the strengthening of Islamic Religious Education teachers' pedagogical and professional competencies (Khairiah et al., 2024; Nisa et al., 2024). This results in training that is short-term, unsustainable, and does not significantly improve teachers' ability to design religious instruction based on digital platforms. The core problem lies not in the limited use of technology but rather in the absence of a comprehensive digital training framework to strengthen teachers' mastery of digital pedagogy, religious content, and instructional skills (Caena, 2021; d'Alonzo et al., 2023). Therefore, research on strategic and structured digital training design is crucial to address the need to improve the professional competency of Islamic Religious Education teachers.

Empirical observations at junior high schools in Cilaku District indicate that most Islamic Religious Education (PAI) teachers have utilized digital platforms such as Google Classroom, WhatsApp Groups, and video conferencing, but have not been able to optimize these platforms for interactive, reflective, and pedagogically valuable learning. Teachers tend to simply transfer lecture material to digital formats, upload teaching materials in PDF format, and assign assignments without a learning design that encourages collaboration and critical thinking among students (Farrell et al., 2024; Krolevetskaya et al., 2022). Furthermore, teachers report difficulties in developing multimedia-based learning media, conducting digital assessments, and designing learning activities that strengthen the internalization of Islamic values. These field findings indicate

an urgent need for systematic and targeted digital training to support teacher professional growth in Cilaku District.

Pamungkas et al. (2024) and Yulia et al. (2024) research on TPACK emphasizes the importance of simultaneous technological, pedagogical, and content competencies to create effective digital learning. Zidan et al. (2023), Maula (2021), and Meldia et al. (2024), through the Four-D model, recommends systematic stages in developing training programs through define, design, develop, and disseminate. Meileni et al. (2022), Romanova et al. (2022), and Zhang et al. (2023) also highlight the urgency of digital-based teacher training transformation to strengthen educator professionalism, while Kalinina et al. (2021) and Arwildayanto et al. (2023) examines the implementation of digitalization of religious learning, but only reaches the descriptive aspect without training intervention. These four studies provide a theoretical foundation, but have not yet integratively presented a digital training model that combines TPACK and Four-D specifically for Islamic Religious Education teachers.

The research gap lies in the lack of a systematically designed digital training framework to improve the pedagogical and professional competencies of Islamic Religious Education teachers through the stages of needs assessment, design, development, dissemination, and impact evaluation. Most studies focus on the urgency of technology utilization or descriptions of changes in teacher behavior, rather than on creating implementable training models that can be directly applied to specific school contexts (Akhmetshina et al., 2021; Kussainova et al., 2024). Therefore, new research is needed to formulate TPACK and Four-D-based digital training that not only improves technological skills but also strengthens teachers' professional competencies in Islamic Religious Education learning. This gap is relevant and crucial to address immediately so that the digitalization of education truly drives changes in learning practices.

The novelty of this research lies in the design of a TPACK and Four-D-based Digital Training Leadership Framework specifically aimed at accelerating the professional growth of Islamic Religious Education (PAI) teachers at junior high schools in Cilaku District. This training model is not only oriented towards mastery of technology, but also towards digital learning leadership, internalization of religious values in the digital ecosystem, and improving the quality of pedagogical relationships between teachers and students (Baymetov et al., 2025; Dias et al., 2024; Koni & Lepp, 2024). This approach allows for sustainable, measurable, teacher-oriented training and results in changes in teaching practices. Thus, this research presents the state of the art in developing Islamic Religious Education (PAI) teacher training through the integration of technology, pedagogy, content, and instructional leadership.

Based on this background, the core problem of this research is related to how to formulate digital training that can improve the pedagogical and professional competence of Islamic Religious Education teachers at SMP Cilaku District, Cianjur, West Java. Based on this foundation, this research assumes that

systematically designed digital training will provide a significant improvement in professional competence.

Argumentatively, this study believes that improving the pedagogical and professional competence of Islamic Religious Education teachers can only be achieved through digital training designed based on the real needs of teachers, the Four-D instructional development system, and the TPACK competency framework. The TPACK and Four-D-based training framework is expected to not only improve digital platform usage skills but also help teachers become visionary, adaptive, and professional digital learning leaders. The contribution of this study is theoretical, namely, enriching the study of technology-based teacher training development for the context of religious education, and is practical as a training model that can be implemented by educational institutions, education offices, and schools. Thus, the results of this study are expected to be a real solution for strengthening the competence of Islamic Religious Education teachers at junior high schools in Cilaku District in the digital era.

RESEARCH METHOD

This qualitative case study aimed to explore the design, development, and impact of TPACK and Four-D-based digital training on improving the pedagogical and professional competencies of Islamic Religious Education (PAI) teachers. The research focused on teachers' experiences, perceptions, obstacles, strategies, and changes in digital learning practices through gradual training (Rusandi, 2021). Conducted at a junior high school in Cilaku District, Cianjur, West Java, Indonesia, the study addressed the lack of systematic, continuous training for PAI teachers, despite their implementation of digital learning. Purposive sampling was used to select informants, including PAI teachers, school principals, PAI supervisors, and digital training facilitators, ensuring depth and diversity of data until saturation was achieved.

Table 1. Informant Data

Informant	Total	Title / Position	Function in Research	Reason for Selection
Teacher	12	Islamic Education Subject Teacher	Digital learning implementers and training participants	Direct recipients of digital training impacts and implementers in the classroom
Headmaster	1	Headmaster	Providing policy support for teacher professional development	Determinant of the direction of learning quality and the person in charge of teacher competency improvement programs
PAI Supervisor	1	Islamic Education SubProject Supervisor	Learning quality validator and supervision assistant	Have the authority to guide, supervise, and evaluate Islamic Education teachers
Digital Training Facilitator	4	Digital Training Trainer / Resource Person	Digital training designer and implementer	Understand the training design process technically and pedagogically

The research informants comprised four primary groups purposively selected based on their level of involvement in the digital training and Islamic Religious Education (PAI) learning process. First, twelve Islamic Religious Education (PAI) teachers with a bachelor's or master's degree in education were selected because they are the direct implementers of digital learning and the primary beneficiaries of the training. Second, one principal with a bachelor's or master's degree in education was selected because of their role in policy support, teacher professional development, and determining the direction of learning quality in schools. Third, one Islamic Religious Education (PAI) supervisor with a master's degree was selected because of their authority in supervising and evaluating the quality of Islamic Religious Education (PAI) learning, thus serving as a validator of information regarding the need for and impact of digital training. Fourth, four digital training facilitators with bachelor's or master's degrees, or digital literacy certificates, were selected because they designed and implemented the training and therefore possessed a deep understanding of the technical and pedagogical aspects of the training provided. These four groups of informants were selected intentionally to provide depth and diversity of data, allowing researchers to comprehensively understand the digital training process from the perspectives of implementers, policymakers, quality coaches, and training program designers.

Data collection was conducted through observation, in-depth interviews, and documentation studies (Waruwu, 2023). Observations were conducted during the digital training process and its implementation in Islamic Religious Education (PAI) learning to obtain naturalistic data regarding the dynamics of the use of digital platforms such as Canva, Wordwall, Quizizz, Google Classroom, Padlet, and PowerPoint. In-depth interviews were used to explore teachers' experiences regarding training needs, the application of training outcomes, and their perceptions of changes in professional competency after the training. Documentation was collected to strengthen field findings, including training syllabi, training materials, digital learning media products created by teachers, digital learning designs, activity photos, and training evaluation results.

Data analysis was conducted interactively, referring to Miles, Huberman, and Saldaña, through three stages: data condensation, data presentation, and drawing and verifying conclusions (Rifa'i, 2023). Data condensation was carried out by sorting and reducing data based on the themes of needs, training design, development, dissemination, and the impact of training on teacher competency. Data presentation was carried out in the form of narratives, matrices, and thematic relationship patterns to clarify the dynamics of changes in teacher competency during the training. The final stage, namely verification of conclusions, was carried out continuously by comparing data between sources, across time, and between techniques to ensure that the findings were not the result of one-sided interpretations, but rather a factual representation of empirical reality in the field.

RESULT AND DISCUSSION

Result

This research results section presents the main findings obtained through observations, interviews, and document analysis of digital training for Islamic Religious Education (PAI) teachers. The results are presented to provide a comprehensive overview of the process of optimizing pedagogically based digital training design, integrating technology for professionalism, and developing a platform-based adaptive collaborative training model. The following description systematically presents each result based on the research's empirical data.

Optimizing Pedagogy-Based Digital Training Design

Optimizing pedagogically based digital training design in the context of this research is understood as the process of developing, adapting, and refining digital training that directly addresses the needs of Islamic Religious Education teachers in improving their technology-based teaching skills. This concept focuses training not solely on application mastery but also on teachers' ability to design interactive digital learning that is relevant to religious education objectives and creates meaningful learning experiences for students. In the field, this optimization is evident from input from teachers, principals, supervisors, and training facilitators regarding the training elements deemed most needed, including practical materials, flexible training times, ongoing technical support, and collaborative spaces for developing digital learning media.

An Islamic Religious Education (PAI) teacher at one school stated, "We've learned to use Google Classroom and WhatsApp, but we haven't been taught how to create engaging digital learning that fits our students' personalities. We want training that directly teaches practical lessons, not just theory." This statement demonstrates that teachers' needs extend beyond application usage to digital pedagogical skills to design creative, interactive, and contextual Islamic Religious Education (PAI) learning. The researchers' interpretation suggests that teachers' ideal training design guides them in producing digital teaching products, not just introducing application features. Therefore, the need for real-world practice is the primary basis for optimizing Training design.

The principal reinforced these findings by stating, "Teachers are actually willing to learn technology, but they need flexible, practical training and support to build confidence when implementing it in the classroom." This information confirms that time flexibility, a hands-on approach, and post-training support are key factors in the effectiveness of digital training. The researchers' interpretation suggests that optimizing training is not only related to content but also to the design of the training system, particularly regarding the rhythm of adult learning, teacher confidence, and the alignment of the training schedule with teaching hours. This indicates that training design must consider the technical, psychological, and professional aspects of teachers.

Training observations revealed that teachers showed high interest when the training sessions included hands-on practice in creating digital learning media, but appeared less enthusiastic when the sessions were theoretical.

Researchers observed that teachers were more active in asking questions and sharing experiences when the training provided opportunities to explore Canva, Wordwall, Quizizz, Padlet, and PowerPoint, compared to when the resource person presented a presentation without practice. A restatement of this data suggests that the effectiveness of digital training depends on the dominance of real-world practice over conceptual material. A description of the pattern of findings indicates that ideal training should prioritize practice-based learning, time flexibility, assistance in implementation, and a focus on digital learning products, rather than simply material presentation. Therefore, optimizing pedagogically-based training design leads to the concept of learning by doing, psychological support through mentoring, and a training structure that is responsive to the professional needs of Islamic Religious Education teachers.

Integration of Learning Technology for Professionalism

The integration of learning technology for professionalism in this study is understood as the ability of Islamic Religious Education teachers to combine digital tools, pedagogical strategies, and platform-based learning management to improve the quality of the teaching and learning process. In the field, this integration is seen when teachers not only operate applications but also use them in a targeted manner to present material, build interactions, assess learning, and manage digital classes. Teacher professionalism is reflected in how technology is used as a medium to encourage creativity, two-way communication, and strengthen student engagement in Islamic Religious Education learning. All interpretations of these sub-findings are based on direct observation data when teachers practice using Canva, Wordwall, Quizizz, Google Classroom, Padlet, and PowerPoint in training sessions and learning simulations.

The following table presents the results of observations of the implementation of digital training for Islamic Education teachers, which include technology integration activities in digital learning based on indicators and the percentage of achievement of observed behavior.

Table 2. Observations of Learning Technology Integration for Professionalism

Observation of Technology Integration Activities	Indicators of Teacher Professional Behavior	Percentage of Achievement
Media creation practice on Canva	Producing visual content for Islamic Education learning	85%
Implementation of Wordwall and Quizizz	Designing interactive digital assessments	78%
Using Google Classroom	Managing digital classes & providing feedback	72%
Utilization of Padlet	Digital collaboration & discussion between students	74%
Digital PowerPoint presentation	Presentation of material with a pedagogical flow	81%
Platform-based teaching simulation	Leading a digital class independently	69%

The observation table shows that the indicator with the highest percentage was the practice of creating learning media through Canva (85%), indicating that

teachers master technology more quickly when the process is based on visual design and hands-on practice. The use of PowerPoint for pedagogical presentations came in second (81%), indicating that teachers are relatively familiar with slide-based material delivery, resulting in faster adaptation. Wordwall and Quizizz achieved 78%, indicating that digital assessments can be well integrated but still require further training for more in-depth question development. The use of Padlet for collaboration reached 74%, indicating teachers' ability to manage digital interactions, but they still need to improve their skills in directing online discussions. Google Classroom was at 72%, illustrating that managing a digital classroom requires a longer adaptation process. The lowest percentage was seen in platform-based teaching simulations (69%), indicating that leading fully digital learning remains a challenging area for some teachers.

The percentages in Table 2 reflect the achievement of teacher activity indicators during training, calculated by dividing the number of fulfilled indicators by the total number of indicators and multiplying by 100%. For example, Canva achieved 85% because most indicators for creating visual media were met, while PowerPoint reached 81% for successful digital presentations. Wordwall and Quizizz scored 78% for digital assessments, but still require improvement in question construction. Padlet achieved 74% in managing digital discussions, but needs more work in guiding online collaboration. Google Classroom scored 72% due to the longer adaptation needed for digital classroom management. The lowest score, 69%, for platform-based teaching simulations, shows that leading complete digital learning is the most challenging for teachers.

The researchers' interpretations indicate that the more concrete and direct the technology practice, the higher the level of professional competence demonstrated by teachers. A restatement of these findings shows that teachers most quickly master technology when it is used to produce visual and multimedia learning products, are quite competent when using it for evaluation and collaboration, but still require guidance in fully leading digital learning. Observational findings also indicate that technical competence in operating applications is not automatically aligned with pedagogical competence in facilitating digital classroom interactions, so that strengthening the ability to direct, manage communication, and evaluate the learning process is needed. Overall, the data pattern shows that the development of teacher professionalism is a gradual process, starting from mastery of technology as a tool for content production, then as a medium for assessment and collaboration, and finally towards full digital learning leadership.

Platform-Based Adaptive Collaborative Training Model

The platform-based adaptive collaborative training model in this study is understood as a training pattern built from training implementation documents, which show the flow of digital learning activities collaboratively, in stages, and adapted to teacher capabilities. This definition refers to the training curriculum structure, digital modules, digital lesson plans, training learning media, pretest-posttest assessment reports, documentation of good practice sharing activities,

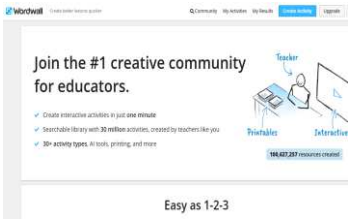
and training photographs. All these documents illustrate that the training is designed not only to transfer technological knowledge, but also to build teacher professional competence through platform-based learning based on practice, collaboration, independent projects, and dissemination of results.

The documentation shows a consistent training flow: (1) introduction to the use of digital platforms; (2) practical guidance in creating learning media such as Canva, Wordwall, Quizizz, Classroom, Padlet, PowerPoint; (3) preparation of digital teaching tools such as digital lesson plans, teaching media, digital evaluation links, and online class clusters; (4) application of training results through learning simulations; and (5) dissemination forums to present good practices among teachers. The researcher's interpretation shows that this flow forms an adaptive collaborative training pattern, namely training that starts from demonstrations, moves to independent practice, then reflection and sharing of results together so that teachers not only practice but also inspire, assess, and strengthen each other's competencies.

Source:
https://www.canva.com/ai

Canva

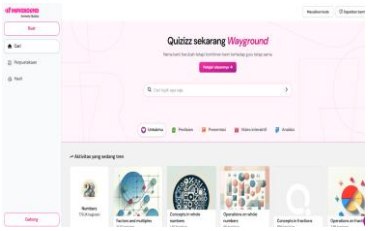
Canva is an easy-to-use online graphic design application that is highly sought after by training participants due to its simple interface, comprehensive features, and support for digital learning needs. Through Canva, teachers can create engaging visual teaching materials, utilize ready-made templates, and enhance their creativity in professionally presenting learning materials.



Source:
https://wordwall.net/myactivities

Wordwall

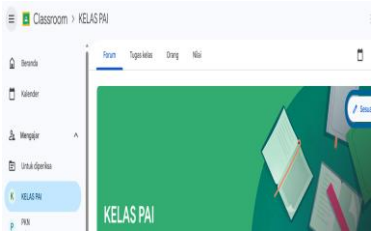
Wordwall is a fast and easy-to-use platform for creating game-based learning activities without requiring advanced technical skills, making it highly effective in enhancing teacher creativity in developing digital media. Its game templates, activity bank, and automated evaluation features enable more interactive and engaging learning, while also supporting efficient student assessment.



Source:
https://wayground.com/

Quizizz

Quizizz is a game-based learning evaluation app that allows teachers to quickly create interactive quizzes through question creation, a question bank, and Live Game and Homework modes. Its automated grading system and analytical reports help teachers efficiently assess student understanding while boosting learning motivation through gamification.



Source: https://sites.google.com/view/classrooms-workspace/

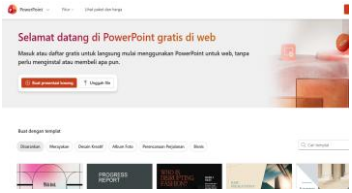
Google Classroom

Google Classroom is an integrated learning management platform that helps teachers organize digital classrooms through features like Forums, Classwork, People, and Grades. This app facilitates material sharing, automated grading, collaboration, and scheduling, supporting both distance and hybrid learning in an efficient, structured, and professional manner.

Source: https://padlet.com/

Padlet

Padlet is a collaborative virtual board platform that allows users to share various types of content in real time, such as text, images, videos, and documents. With a variety of templates, teamwork features, and interactive discussion spaces, Padlet supports creative, collaborative, and flexible learning for both teachers and students.



Source: https://powerpoint.cloud.microsoft/id-id/

PowerPoint

PowerPoint for the web is a free, browser-based presentation platform that provides a variety of ready-to-use templates so users can quickly create or edit presentations without installing software. Cloud-based automatic saving and link sharing make it convenient for collaboration and professional delivery of learning materials.

The training module documents show that each session is designed around digital project assignments, allowing teachers to produce tangible products after each session. The digital lesson plan documents demonstrate the systematic implementation of platform-based learning, from objectives, methods, digital activities, to online assessments. Training photos and recordings demonstrate the collaborative process between teachers in designing digital media and creating Google Classroom classes in groups. *Pretest-posttest* reports demonstrate an increase in teachers' digital competency scores after the training. Dissemination forum documentation shows a presentation session between schools, including open feedback from other participants. The researchers' interpretations based on these documents indicate that the training not only resulted in improved individual skills but also fostered a collective learning environment where teachers supported each other in the digital learning innovation process.

In short, all training documents illustrate that teachers learn technology through a "learn, practice, apply, and share" approach. Teachers begin by introducing digital platforms, then develop learning media, develop platform-based digital lesson plans, apply the results in teaching simulations, and finally present their best practices to share with other teachers. This restatement emphasizes that the training does not direct teachers to become mere users of

technology, but rather to become innovators who produce digital learning and contribute to improving the competency of other teachers.

This indicates that the overall documentation pattern shows that the use of training documents reflects a progressive training model: starting with technology demonstrations, continuing to the production of digital learning media, then the development of digital teaching tools, followed by implementation in digital classrooms through simulations, and ending with the sharing of good practices to strengthen professional networks among teachers. This pattern shows that the most effective digital training is training that provides space for collaboration, adaptation to each teacher's learning pace, and dissemination of results, until professional solidarity is formed to advance the quality of platform-based Islamic Religious Educational learning.

Discussion

The research findings indicate that the effectiveness of digital training design for Islamic Religious Education (PAI) teachers is not solely determined by application mastery, but rather by digital pedagogical skills to design interactive, contextual, and meaningful learning. These results align with Fawaid et al. (2025) and Aziz (2025) view within the TPACK framework that technology-based professionalism encompasses not only technological knowledge but rather a combination of technology, pedagogy, and content. This alignment is evident when teachers in the study desired hands-on practice that resulted in digital teaching products, rather than simply socializing application features (Hina, 2024; Sain, 2025). However, the research findings differ from some conventional training models that focus on technology demonstrations rather than on designing religious learning that is relevant to student characteristics; thus, digital training has not fully addressed the professional competency needs of Islamic Religious Education (PAI) teachers.

Observations show that teachers most quickly master technology when it is used for learning media production (Canva 85%; PowerPoint 81%), are quite competent when technology is used for assessment and collaboration (Wordwall & Quizizz 78%; Padlet 74%), but still experience challenges when technology is used to lead full digital learning (platform-based teaching simulations 69%). These findings are consistent with Knowles' learning-by-doing and andragogy theories, which emphasize that adult learning is most effective when oriented towards real-world practice, professional needs, and work contexts (Herlina, 2024; Nisa', 2024) Thus, the research findings confirm that teachers' digital competence develops gradually from technical skills to pedagogical skills to digital learning leadership. However, these findings differ from the assumption that teachers who are able to operate automated applications are able to facilitate digital classes; in reality, technical competence is not directly proportional to digital pedagogical competence (Heru, 2024; Zamroni et al., 2025).

The platform-based, adaptive collaborative training model identified in the study technology demonstration → independent practice → teaching tool production → teaching simulation → dissemination of good practices aligns with Wenger's Communities of Practice theory, which emphasizes that teacher

professionalism is formed through social learning, collaboration, knowledge sharing, and mutual feedback (Abdullah, 2024; Khaer, 2024). However, this training structure also expands on this theory by not only building a learning community but also encouraging teachers to become producers of digital learning content, not just participants. This demonstrates that effective digital training for Islamic Religious Education teachers is not one-way instructional, but rather project-based and collaborative (Aguaded et al., 2023; Widiasari, 2024).

The theoretical implication of these findings is that developing the digital competence of Islamic Religious Education (PAI) teachers requires a refined approach to educational technology training: training should not simply teach technology as a teaching tool, but should also build technology-content-pedagogy integration and position teachers as designers of digital learning experiences. Practically, digital training for Islamic Religious Education (PAI) teachers should emphasize practical practice, flexible timeframes, post-training support, peer-mentoring, and media development projects and digital teaching tools. Furthermore, enhancing digital competence cannot rely solely on single-session training sessions, but requires a sustainable learning ecosystem through collaborative spaces and forums for sharing good practices among teachers.

Thus, this research discussion confirms that the transformation of Islamic Religious Education (PAI) teacher professionalism in digital learning will only be achieved if training is designed pedagogically, collaboratively, and based on teachers' real needs. The training paradigm must shift from teaching technology to designing learning with technology, from knowledge transfer to co-creation, and from enhancing individual abilities to enhancing collective competencies. These findings are an important contribution to the development of digital training models in schools, as they demonstrate that technology does not automatically improve the quality of learning; learning quality improves when technology is used pedagogically, reflectively, and collaboratively within the framework of teacher professionalism.

CONCLUSION

This research shows that digital training for Islamic Religious Education (PAI) teachers is only effective if it is designed not to master applications, but to master pedagogically based digital learning design. The most important lesson from this research is that teachers' professional competence develops gradually, starting with technical skills in operating applications, progressing to pedagogical skills in using technology for assessment and collaboration, and culminating in digital learning leadership capable of creating interactive and meaningful learning experiences. The success of the training is not determined by the number of applications introduced, but by opportunities for practice, mentoring, learning flexibility, and the production of digital teaching tools relevant to students' contexts. Therefore, the best digital training is not oriented towards technology transfer, but rather on transforming learning practices through learning by doing, collaboration between teachers, and the direct application of training outcomes in learning simulations.

Scientifically, this study makes an important contribution through the design of a Digital Training Leadership Framework based on TPACK and Four-

D that positions teachers as designers and leaders of digital learning, not just users of technology. This model adds aspects of instructional leadership and collaborative practices to digital training, an area that has not been comprehensively accommodated in previous research. However, this study has limitations in its geographic scope (a junior high school in Cilaku District) and the duration of the training implementation, which did not observe the long-term impact on student learning outcomes. Further research is recommended to test the effectiveness of this training model at different school levels, expand the focus on the integration of Islamic values in the digital ecosystem, and develop longitudinal evaluation instruments to measure teachers' continuous professional development over time.

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