

Improving Digital Literacy Among Islamic Religious Education Teachers Through Online Training in Talaud Islands Regency

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Keywords	Abstract
Digital Literacy; Islamic Religious Education Teachers; Online Training, Island Region.	This study analyzed: (1) the implementation of online training for Islamic Religious Education (IRE) teachers; (2) teachers' digital literacy following the training and its application in classroom instruction; and (3) the supporting and constraining factors affecting the implementation of online training and teachers' digital literacy in Talaud Islands Regency. A descriptive qualitative approach was employed, with thirteen informants selected through purposive sampling, including six IRE teachers, the Head of the Ministry of Religious Affairs Office, an IRE supervisor, one principal, and four students. Data were collected through semi-structured interviews, observations, and document analysis and were analyzed using the Miles and Huberman interactive model. The trustworthiness of the findings was enhanced through source and method triangulation and member checking. The findings revealed that online training was delivered through webinars, workshops, technical guidance programs, distance education, and independent digital learning. The training covered instructional planning, curriculum implementation, interactive learning media, digital assessment tools such as Quizizz and Google Forms, and digital literacy competencies. Zoom Meetings was the most frequently used platform, although teacher participation remained uneven. Teachers' digital literacy improved across information access, digital platform utilization, digital media development, digital assessment, digital ethics, and technology integration in IRE instruction. However, teachers' levels of digital literacy varied and were influenced not only by online training but also by self-directed learning, teacher professional education programs, teacher working groups, professional learning communities, and peer support. Supporting factors included teachers' motivation, institutional support from schools, the Ministry of Religious Affairs, and supervisors, as well as the availability of technological facilities. The primary constraints included unstable internet connectivity, limited access to digital devices, inadequate digital competencies, and inconsistent institutional support across different areas.

INTRODUCTION

Education plays a strategic role in developing high-quality human resources with strong character and a solid spiritual foundation (Sugiarto & Dewantara, 2021). In this context, teachers are key determinants of the quality of the instructional process in schools. In particular, Islamic Religious Education (Pendidikan Agama Islam [PAI]) teachers are responsible not only for delivering religious knowledge but also for serving as role models in shaping students' moral character, faith, and values (Judrah, 2024).

The rapid advancement of digital technology has fundamentally transformed the global educational landscape, including PAI instruction (Judijanto et al., 2025). Integrating

technology into classroom instruction is no longer optional but has become essential for creating effective, innovative, and relevant learning experiences that meet the characteristics and needs of Generations Z and Alpha. Consequently, PAI teachers are expected to possess strong digital literacy competencies to integrate digital technologies effectively into the instructional process (Aini & Aisyah, 2025; Almardiah & Muis, 2025; Diniyah et al., 2026; Nata et al., 2024).

Digital literacy extends beyond technical skills in operating digital devices. It also encompasses the cognitive and social competencies required to access, analyze, evaluate, create, and communicate digital information critically, ethically, and responsibly (Wahyuni et al., 2024). Within PAI instruction, digital literacy has become increasingly important because students are exposed to an extensive flow of digital information, including content that may conflict with Islamic values. Therefore, PAI teachers play an essential role in guiding students to use digital media critically, responsibly, and in accordance with Islamic principles.

The Talaud Islands Regency, an archipelagic region located along the Indonesia–Philippines border, provides a distinctive empirical context compared with urban areas. Its dispersed geography, long travel distances, high transportation costs, limited electricity supply, and unstable internet connectivity restrict PAI teachers' access to face-to-face professional development. Consequently, improving the digital literacy of PAI teachers in Talaud Islands Regency cannot be separated from the realities of Indonesia's Frontier, Outermost, and Disadvantaged (3T) regions, which require flexible, accessible, and cost-effective professional development models capable of reaching teachers in remote island communities.

Despite these needs, the digital literacy of PAI teachers in the region remains limited. Preliminary observations conducted by the researchers in several schools across Talaud Islands Regency indicated that many PAI teachers continued to rely primarily on conventional instructional methods, including teacher-centered lectures and paper-based assignments, with limited integration of digital technologies. Teachers also encountered difficulties in using Learning Management Systems (LMSs), developing information and communication technology (ICT)-based instructional media, and integrating credible digital learning resources into PAI instruction.

These observations were further supported by the researchers' experience as instructors in In-House Training (IHT) programs in the region. During practical sessions, many teachers demonstrated only basic digital literacy skills and experienced difficulties with fundamental tasks, such as word processing, document formatting, digital navigation, and managing interactions in online learning environments. These findings indicate a substantial competency gap that limits the effective implementation of technology-enhanced instruction.

The limited digital literacy of PAI teachers is influenced by multiple factors. As one of Indonesia's Frontier, Outermost, and Disadvantaged (3T) regions, Talaud Islands Regency continues to face significant challenges, including limited internet infrastructure, inadequate access to computers and digital devices, and restricted opportunities for continuous professional development.

At the same time, conventional face-to-face professional development programs are difficult to implement because of the region's archipelagic geography, high inter-island transportation costs, and teachers' workload. Consequently, online training has emerged as a strategic, flexible, and cost-effective alternative. Through online training, PAI teachers in

remote island communities can access professional development opportunities without leaving their teaching responsibilities.

This situation presents an important academic paradox. On the one hand, online training offers a practical solution for overcoming geographical barriers and reducing the cost of teacher professional development in remote islands. On the other hand, its effectiveness is constrained by unstable internet connectivity, frequent electricity outages, limited digital devices, and variations in teachers' initial digital competencies. This tension between the need for digital professional development and the limitations of digital infrastructure represents a significant research gap that warrants further investigation.

Previous studies have shown that online training contributes positively to teachers' professional competence (Fanani et al., 2021). Research examining the implementation of the Smart MOOC platform developed by the Ministry of Religious Affairs demonstrated that online training can significantly improve teachers' pedagogical and professional competencies by introducing a wide range of digital instructional tools (Abid, 2025). Similarly, research on the Merdeka Mengajar Platform (PMM) found that digitally delivered professional development provides greater flexibility and expands teachers' access to independent learning opportunities across different regions (Widhiyanti, 2024).

However, studies examining the development of PAI teachers' digital literacy through online training in Indonesia's 3T and remote island regions remain limited. Most previous studies have focused on urban settings or regions with well-developed digital infrastructure. Consequently, the unique geographical, infrastructural, and sociocultural challenges experienced by PAI teachers in border areas such as Talaud Islands Regency have received relatively little scholarly attention.

Accordingly, this study extends beyond examining online training as a professional development activity by exploring how PAI teachers in remote border regions navigate geographical, technical, and pedagogical challenges while developing their digital literacy. This perspective offers a novel contribution by situating teachers' digital literacy within the distinctive context of Indonesia's remote archipelagic 3T regions rather than in settings with adequate technological infrastructure.

Given the educational needs and contextual challenges of remote island regions, this study is particularly significant. It aims to provide a comprehensive analysis of how online training enhances the digital literacy of PAI teachers in Talaud Islands Regency. Specifically, the study seeks to: (1) analyze the implementation of online training for PAI teachers; (2) examine teachers' digital literacy following participation in online training; and (3) identify the factors that support and constrain the implementation of online training and the development of digital literacy. The findings are expected to contribute to the development of teacher professional development models that are responsive to the unique characteristics and challenges of remote island regions.

METHOD

This study employed a qualitative approach to explore the digital literacy of Islamic Religious Education (Pendidikan Agama Islam [PAI]) teachers following their participation in online training. A qualitative approach was selected because it enabled an in-depth understanding of teachers' experiences in participating in online training, integrating digital

technology into classroom instruction, and addressing the sociogeographical challenges of teaching in a remote island region (Moleong, 1990).

A descriptive qualitative design was adopted (Sugiyono, 2013). The study was conducted in several senior high schools and vocational high schools (Sekolah Menengah Atas [SMA]/Sekolah Menengah Kejuruan [SMK]) in Talaud Islands Regency, North Sulawesi, Indonesia. The research site was selected purposively because the region is located in a border area characterized by an archipelagic geography and limited transportation, electricity, and internet infrastructure.

Data were collected through in-depth interviews, classroom observations, and document analysis. Interviews were conducted either face-to-face or through online communication platforms, including WhatsApp, Zoom Meetings, and Google Meet, depending on participants' availability and local network conditions. Observations focused on teachers' implementation of digital technologies during classroom instruction, while documentary evidence included instructional materials, online training records, certificates, and photographs of classroom activities.

Data were analyzed using the interactive model developed by Miles, Huberman, and Saldaña, which involved data transcription, data reduction, data display, and conclusion drawing.

RESULTS AND DISCUSSION

The discussion of the research findings is conducted by interpreting the field findings and connecting them to the concepts of online training, teacher digital literacy, the Technological Pedagogical Content Knowledge (TPACK) framework, and relevant previous research findings. The discussion is structured based on three research problem formulations: the implementation of online training for Islamic Religious Education (PAI) teachers, the condition of Islamic Religious Education (PAI) teachers' digital literacy after participating in online training, and the supporting and inhibiting factors for the implementation of online training and digital literacy in the Talaud Islands Regency.

Implementation of Online Training for Islamic Religious Education Teachers in Talaud Islands Regency

The research results show that online training has become a means of developing Islamic Religious Education (PAI) teacher competencies in the Talaud Islands Regency. The training was conducted in the form of webinars, workshops, technical guidance, distance education and training, and independent learning activities through digital platforms. The materials teachers received included developing learning tools, developing pedagogical competencies, using interactive media, PowerPoint, learning videos, Quizizz, Google Forms, curriculum, and digital literacy.

These findings indicate that online training serves not only as a temporary substitute for face-to-face training but has evolved into a form of teacher professional development. Online training allows teachers to access materials, interact with resource persons, complete assignments, and join learning communities without having to be in the same location. This aligns with the view that an effective online training environment should provide flexibility, interaction, learning activities, and opportunities for participants to connect the material to their professional practice (Apoko & Yatri, 2024).

In the context of the Talaud Islands Regency, the flexibility of online training takes on a more specific meaning. The long distance from Manado City, high transportation and accommodation costs, dependence on ship or flight schedules, and teachers' obligations to leave work and family make opportunities for in-person training more limited. Therefore, online training is not simply a technological option, but a strategy for equitable access to competency development.

These findings align with the evaluation of Distance Education and Training at the Manado Religious Training Center, which showed that distance learning provides a competency development alternative for participants with limited distance and limited opportunities for in-person training. However, implementing distance learning still requires participant readiness, support from organizers, equipment, an internet connection, and appropriate training design (Isharyanti et al., 2023).

While online training expands access, research shows that this access does not automatically translate into equitable participation. Of the six Islamic Education teachers interviewed, some had participated in training frequently, some had only participated a few times, some had only participated in training as students, and some had never participated in online training.

This situation demonstrates a discrepancy between the availability of opportunities and the ability to capitalize on them. Training information may be readily available through professional groups, SIMPKB (Smart Teachers' Program), the Ministry of Religious Affairs' Smart Program, social media, and educational communities, but utilization is influenced by teachers' motivation, technological readiness, initial skills, time, and network conditions. Research on Indonesian teachers' readiness to participate in online professional development also shows that program success is influenced by device readiness, technology proficiency, attitudes toward online learning, and environmental support (Isharyanti et al., 2023).

These findings confirm that online training is not sufficient simply by providing links and materials. Teachers need socialization, basic training on platform usage, mentoring, a suitable schedule, and post-training follow-up. Teachers unfamiliar with digital platforms are likely to not participate even when activities are openly available.

In terms of platforms, Zoom Meetings are the most dominant medium used in training. Google Meet is also used, while Google Drive and Google Docs serve primarily as storage and assignment submission tools. YouTube is utilized for self-study, while SIMPKB, WhatsApp groups, the Guru Penggerak community, and the Ministry of Religious Affairs' Pintar platform are used to obtain training information.

The dominance of Zoom Meetings indicates that the training attended by teachers predominantly uses a synchronous model, where the resource person and participants participate simultaneously. This model offers advantages in terms of direct interaction, discussion, and the opportunity to ask questions. However, the synchronous model is highly dependent on network and power stability. In the Talaud context, this dependency becomes a weakness, as participants can be disconnected from the meeting and lose some of the material when the network experiences disruptions.

This situation demonstrates the need to combine synchronous and asynchronous activities. Conceptual material can be delivered via Zoom, while recordings, modules, videos, and assignments can be accessed independently. Effective online training design cannot rely

solely on video conferencing; it must provide a flexible, interactive, and easily accessible learning environment that allows participants to review the material as needed (Apoko & Yatri, 2024).

The training materials teachers receive are generally relevant to their learning needs. Learning tools, interactive media, videos, PowerPoint presentations, Quizizz, Google Forms, curricula, and digital assessments can be directly applied to teachers' professional work. This relevance is crucial because teacher training will have a stronger impact when the material relates to real-world problems faced by participants.

Efi Susanti's research findings indicate that online learning training can develop teacher competency when conducted in a planned and sustainable manner. This improvement occurs because participants not only receive explanations but also practice and receive follow-up feedback from the training activities (Susanti, 2022). This aligns with the experiences of several Islamic Religious Education (PAI) teachers in Talaud, who stated that training materials are easier to apply when accompanied by practical assignments, opportunities for questions, and mentoring.

However, this study also found that not all training courses are equally in-depth. Some activities consist of short webinars, while others are longer, with assignments, practice, evaluation, and mentoring. These design differences impact the outcomes teachers achieve. Training that includes practice tends to produce more concrete skills than training that only delivers material in a one-way format.

Based on this analysis, the implementation of online training for Islamic Religious Education (PAI) teachers in the Talaud Islands Regency can be understood as a form of professional development that is important and adaptive, but not yet fully structured and equitable. While online training has reduced the barriers of distance and cost, the quality of participation remains dependent on teacher motivation, activity design, mentoring, internet access, electricity, and equipment.

A key finding of this study is that online training can overcome geographical barriers, but it also creates new dependencies on digital infrastructure. In other words, physical distance can be overcome through technology, but access to competency development can still be hampered if electricity, internet, devices, and participants' initial skills are inadequate.

Therefore, online training for Islamic Religious Education (PAI) teachers in island regions needs to be developed into a more adaptive format. Synchronous activities via Zoom should be supplemented with recordings and downloadable modules, mentoring through teacher communities, product-making practice, and limited in-person activities or on-site training for materials requiring direct guidance.

Digital Literacy of Islamic Religious Education Teachers After Participating in Online Training in Talaud Islands Regency

The research results show that Islamic Religious Education teachers' digital literacy in the Talaud Islands Regency has developed, but it is not evenly distributed. This development is evident in their ability to access information, use digital devices and platforms, develop learning media, use technology in evaluation, and provide digital ethics guidance to students.

These findings align with the concept of digital literacy, which emphasizes more than just the ability to operate devices. The UNESCO framework defines digital literacy as the ability to access, manage, understand, integrate, communicate, evaluate, and create information

safely and accurately through digital technology (Isharyanti et al., 2023). Therefore, the ability to use a laptop or application is only one component of digital literacy.

The DigCompEdu framework also explains that educator digital competency encompasses professional engagement, digital resource management, learning and teaching, assessment, student empowerment, and facilitation of student digital competency (Redecker, 2017). When analyzed through this framework, Islamic Religious Education teachers in Talaud have demonstrated progress in several dimensions, particularly the use of digital resources, learning presentation, evaluation, communication, and student mentoring.

To access information, teachers have utilized YouTube, Rumah Pendidikan (Education House), SIMPKB (Smart Ministry of Religious Affairs), Google Classroom, professional communities, ChatGPT, and Gemini. The internet has become a crucial resource due to the limited availability of Islamic textbooks and library facilities in some schools. Teachers are no longer entirely dependent on printed textbooks but can access videos, examples of learning tools, materials, questions, and training information from various sources.

This situation demonstrates that digital literacy has expanded teachers' learning opportunities. Teachers working in island regions can access information that was previously physically difficult to access. However, the ability to search for information is not always accompanied by the ability to thoroughly evaluate the validity of sources. Some teachers select materials based on their relevance to the topic but fail to consistently check the author, publishing institution, publication date, references, and content accuracy.

These findings indicate that teachers' skills are stronger at the access and use stage, but they still need to develop at the assessment and verification stage. This is crucial for Islamic Religious Education (PAI) teachers because not all religious information available online is of the same quality, orientation, and scientific basis. Islamic Religious Education (PAI) teachers must be able to ensure that the materials they use are based on credible Islamic sources, do not contain misinformation, and do not conflict with the principles of religious moderation.

In terms of media and platforms, teachers have utilized laptops, smartphones, LCDs, projectors, PowerPoint, videos, Zoom Meetings, Google Meet, Quizizz, Google Forms, Google Classroom, Canva, CapCut, the Garuda app, and several artificial intelligence services. However, the intensity and level of mastery vary.

Some teachers have mastered creating web-based games, interactive quizzes, interactive PowerPoint presentations, and other learning media. Others are only able to search, download, and combine videos. There are also teachers who haven't yet intensively utilized digital media due to a lack of training and inadequate support from facilities.

These differences indicate that teachers' digital literacy is multifaceted. Some teachers are at the basic level of use, others are able to adapt media, and still others are able to produce interactive media. Therefore, teachers' digital literacy cannot be assessed solely on the basis of ability or inability. Assessments must consider the diversity of abilities, independence, creativity, and the appropriateness of technology use to learning objectives.

These findings can be analyzed using the TPACK framework developed by Mishra and Koehler. TPACK explains that effective technology-based learning requires a combination of technological knowledge, pedagogical knowledge, and content knowledge (Mishra & Koehler, 2006). Teachers need not simply be able to use applications; they must also understand why

those applications were chosen, how they are used in learning, and how technology helps students understand the material.

The use of videos to explain Islamic history, Quizizz to increase student engagement, web-based games for assessment, and interactive PowerPoint presentations demonstrate efforts to connect technology with pedagogical strategies and Islamic Religious Education materials. These practices have moved beyond using technology as an administrative tool to leveraging it to support the learning process.

However, TPACK integration is not yet evenly distributed. Some teachers use technology based on material considerations and student characteristics. For others, technology use is limited to playing videos or delivering presentations. Thus, increased technical skills do not necessarily translate into a deep integration of technology, pedagogy, and content.

These findings suggest that further training should not simply teach how to use the application. Training should help teachers answer three questions: what technology is appropriate, for what learning purposes it is used, and how it helps students understand Islamic Religious Education (PAI) material. This approach will prevent the use of technology that is merely visually appealing but lacks pedagogical value.

In learning evaluations, some teachers have used the Garuda app, Quizizz, Google Forms, and web-based games. Digital evaluations help teachers present more varied questions, obtain results quickly, and increase student enthusiasm. However, implementation is not yet widespread because not all students have adequate devices, data packages, and network connectivity.

This situation demonstrates that teachers' digital competence is inseparable from the readiness of the learning ecosystem. Teachers may be capable of creating digital assessments, but their use cannot be enforced if students' facilities are unequal. Therefore, teachers need to provide equitable alternatives, including offline assessments, group activities, the use of school devices, or pre-downloaded materials.

In terms of digital ethics, Islamic Religious Education teachers have taught the wise use of social media, the principle of *tabayun* (reflection), "filtering before sharing," the use of the internet for beneficial activities, and the responsible use of artificial intelligence. These findings demonstrate the unique digital literacy of Islamic Religious Education teachers. Teachers not only teach technology skills but also connect them to the values of honesty, politeness, responsibility, usefulness, and respect for others.

However, digital ethics education in this study was still primarily provided through advice, direct supervision, and reprimands. Systematic implementation of account security, personal data protection, copyright, digital footprints, artificial intelligence content verification, and cyberbullying prevention was not found. These aspects need to be included in future training materials.

The implementation of digital literacy in learning has received a positive response from students. Students stated that videos, quizzes, PowerPoint presentations, the internet, and digital media made Islamic Religious Education (PAI) learning more engaging, interactive, and easier to understand. Learning, which previously focused on teacher explanations, began to provide space for students to seek information, provide comments, take quizzes, and participate directly in activities.

These results align with research on online Islamic Education (PAI) learning, which shows that the use of technology and appropriately designed interactions can increase student engagement (Zulkifli et al., 2022). However, this study does not conclude that learning changes are entirely due to online training. Some teachers' skills are also acquired through lecture experience, PPG (School Teacher Training Program), KKG (Community Working Group), school outreach, YouTube, self-study, and peer support.

Thus, research findings indicate that Islamic Religious Education teachers' digital literacy development is hybrid, formed through a combination of formal training, independent learning, professional communities, work experience, and peer support. Online training is a key driver, but not the sole source, of teachers' digital skills.

The main finding in the second research question is that Islamic Religious Education teachers' digital literacy has developed stronger in the operational and pedagogical dimensions, while the critical, security, source validation, copyright, and data protection dimensions still need strengthening. Skill levels are also uneven, influenced by training experience, motivation, facilities, and school context.

Therefore, the development of Islamic Religious Education (PAI) teachers' digital literacy needs to shift from simply being able to use applications to the ability to select, evaluate, create, and integrate technology pedagogically and ethically. Training should be based on tangible products, such as digital modules, videos, interactive quizzes, offline teaching materials, and lesson plans that integrate technology, pedagogy, and PAI content.

Supporting and Inhibiting Factors in the Implementation of Online Training and Digital Literacy for Islamic Education Teachers in the Talaud Islands Regency

The research results show that the success of online training and digital literacy implementation is not determined by a single factor. The process is influenced by the relationship between teacher motivation, principal support, Ministry of Religious Affairs policies, the role of supervisors, professional communities, devices, internet networks, electricity, time, geographic conditions, and student readiness.

The most prominent internal factors are teacher motivation and willingness. Teachers who actively seek information, join communities, participate in training, and learn independently tend to have more diverse digital skills. Conversely, teachers who have not received training and receive less support tend to still use conventional media.

These findings align with research on teacher readiness for online professional development, which shows that readiness is not only related to equipment but also motivation, self-confidence, attitudes toward technology, and independent learning abilities (Isharyanti et al., 2023). This means that providing facilities without strengthening motivation and mentoring does not necessarily result in changes in practice.

However, differences in teacher abilities cannot be explained solely as a matter of individual motivation. Research shows that teachers work under conditions of unequal facilities and access. Teachers working in schools with internet access, projectors, laptops, and leadership support are more likely to implement training outcomes than teachers working in schools with limited facilities.

Principal support is crucial, as it grants permission, provides a network, allows teachers to participate in training, and gradually procures equipment. This support demonstrates that

digital transformation is not solely the responsibility of teachers but requires school policy and leadership.

The Ministry of Religious Affairs and the Islamic Religious Education Supervisory Agency also play a crucial role through the provision of distance education and training, information dissemination, motivation, and coaching. However, research indicates the need for a more structured program to ensure training does not rely solely on individual teacher initiative. Training information needs to be disseminated uniformly, inactive teachers need to be identified, and follow-up through mentoring is necessary.

Professional communities and peer support are strong supporting factors. Teachers obtain information through PGRI (Indonesian Teachers Association), Teacher Leaders (Teachers Movement), Teacher Working Groups (KKG), Teachers' Working Groups (MGMP), and other educational groups. Teachers who master the application also have the potential to become mentors for their colleagues. This aligns with the concept of communities of practice, a professional development process through shared experiences, problem-solving, reflection, and collaborative learning within a community (Rodi et al., 2022).

In the Talaud context, communities of practice have strategic value because they can reduce reliance on resource persons from outside the region. Teachers who have received training can share materials with other teachers through in-person meetings or Zoom. Mentoring by peers who understand local conditions also tends to be more contextualized than training designed entirely from outside the region.

The most dominant inhibiting factors are internet connection and power outages. These two obstacles are interrelated. When the power goes out, the internet connection often goes down. As a result, teachers are logged out of Zoom, miss explanations, are unable to participate in practicals, and do not complete the entire training series.

This finding aligns with the Manado Religious Training Center's distance learning evaluation, which showed that network limitations, equipment, interaction, and participant readiness remain issues in distance learning (Safaruddin, 2024). In the Talaud context, these issues are further complicated by unstable network and electricity supply in all areas.

Device limitations were also found among teachers, schools, and students. Teachers experienced slow laptops and limited smartphone memory. Schools had an insufficient number of LCD screens, while some students lacked devices or data packages. These conditions demonstrate that the digital divide is not simply a matter of internet access, but also concerns device quality, user capabilities, access costs, and opportunities to use technology.

Time is another barrier. Teachers attend training while juggling teaching, administrative duties, socio-religious activities, and family responsibilities. The flexibility of online training can become a disadvantage if the activities aren't attended with full concentration. Therefore, online training requires time management, re-accessible materials, and school support to reduce the workload while teachers participate.

The geographical conditions of the Talaud Islands Regency present a paradoxical situation. This situation is a primary reason why online training is so urgently needed, but at the same time, it also contributes to the limited infrastructure required for training. Online training overcomes travel distances, but it doesn't completely overcome digital distances.

This finding is a key feature of this study. In urban areas, online training is often understood primarily as a form of flexibility. In the Talaud Islands Regency, online training

serves as a necessary access point, but its success remains fragile due to its reliance on electricity, internet access, devices, and participants' adaptability.

Teachers employed various strategies to overcome these limitations. Some moved to locations with better network connectivity, used Wi-Fi in prayer rooms, sought information on blackout schedules, used personal data plans, provided hotspots to students, and downloaded videos for offline use. These strategies demonstrate teachers' adaptability and professional resilience.

This ability can be interpreted as a form of adaptive digital professionalism, namely the ability of teachers to adapt technology use to environmental constraints without disrupting the learning process. Teachers don't always use the most advanced technology, but rather choose technology that is readily available, simple, and allows for ongoing learning.

However, individual adaptability should not be used as an excuse to ignore infrastructure issues. Using personal plans, moving locations, and piggybacking on networks are temporary solutions. Long-term solutions still require support from the government, service providers, schools, and development institutions.

Based on these findings, online training for Islamic Religious Education (PAI) teachers in the Talaud Islands Regency is more appropriately developed through a combination model. Conceptual materials and activities that do not require complex practice can be conducted online. Recordings and modules should be downloadable to anticipate network disruptions. Meanwhile, limited in-person training (PDWK) remains necessary for technical materials, media creation, digital evaluation, source verification, digital security, and the use of artificial intelligence.

Thus, online training remains a relevant strategy for island regions, but it cannot stand alone. Its success requires an ecosystem that includes teacher motivation, leadership support, guidance from the Ministry of Religious Affairs, professional communities, adequate equipment, a stable network and electricity supply, and student readiness.

The main finding of the third research problem is that the issue of online training and digital literacy for Islamic Religious Education teachers is not just a matter of individual ability, but rather an ecosystem issue. When one element is lacking support, such as network connectivity, electricity, devices, time, or school policies, training outcomes are difficult to implement optimally. Therefore, developing digital literacy for Islamic Religious Education teachers in the Talaud Islands Regency requires a collaborative, contextual, sustainable approach that aligns with the characteristics of the archipelago.

CONCLUSION

This study demonstrated that online training has become a strategic approach to enhancing the digital literacy of Islamic Religious Education (Pendidikan Agama Islam [PAI]) teachers in the border region of Talaud Islands Regency by helping to overcome geographical and logistical barriers. Through webinars, technical guidance programs, workshops, and asynchronous distance learning delivered via Sistem Informasi Manajemen Pengembangan Keprofesian Berkelanjutan (SIMPKB) and Pintar Kementerian Agama (Pintar Kemenag), teachers enhanced their operational digital skills, digital information literacy, and ability to integrate digital technologies, including generative artificial intelligence (AI) tools such as ChatGPT and Gemini, into classroom instruction. These developments encouraged a shift from

teacher-centered instruction toward more interactive and student-centered learning. Nevertheless, teachers' participation and levels of digital competence remained uneven because of differences in motivation, age, technological readiness, and the availability of reliable electricity and internet connectivity across the islands.

Furthermore, the findings revealed that teachers' digital literacy was influenced not only by online training but also by the interaction of multiple supporting factors, including educational background, participation in Pendidikan Profesi Guru (PPG), professional learning communities such as Kelompok Kerja Guru (KKG) and Musyawarah Guru Mata Pelajaran (MGMP), and self-directed learning. The successful implementation of digital literacy was further supported by teachers' intrinsic motivation, supportive school leadership, instructional supervision, and peer coaching. However, persistent challenges—including unstable electricity supply, limited internet access, inadequate student access to digital devices, and insufficient educational technology infrastructure—continued to constrain its broader implementation. Therefore, strengthening teachers' digital literacy in remote and border regions requires not only sustained online professional development but also comprehensive efforts to reinforce the supporting educational ecosystem and ensure equitable access to reliable digital infrastructure.

REFERENCES

- ABID, M. (2025). *Implementasi platfrom pelatihan mooc Pintar dalam meningkatkan kompetensi pedagogik guru PAI di MAN 2 kota semarang* (Doctoral dissertation, Universitas Islam Sultan Agung Semarang).
- Aini, I. N., & Aisyah, N. (2025). Digital Literacy as a Response to the Threat of Radicalism in Islamic Education (PAI) Learning in Secondary Schools. *JURNAL ISLAM NUSANTARA*, 9(1), 197–211.
- Almardiah, D. H., & Muis, A. A. (2025). The Effectiveness Of Digital Media In Learning Islamic Religious Education (Pai) In The Era Of Society 5.0: Study Of The Integration Of Technology And Religious Values. *Jurnal Eduslamic*, 3(1), 45–55.
- Apoko, T. W., & Yatri, I. (2024). Designing effective online learning environments for teacher professional development: Evidence from Indonesian in-service teachers. *Dinamika Ilmu*, 24(2), 257–274. <https://doi.org/10.21093/di.v24i2.9172>
- Diniyah, A. N., Jannah, L. A., & Gumindari, S. (2026). The Role Of Digital, Information, And Media Literacy In Improving The Pedagogical Competence Of PAI Teachers At SMP Ma'arif Tukdana. *JHSS (JOURNAL OF HUMANITIES AND SOCIAL STUDIES)*, 9(3).
- Fanani, M. I., Yuliantari, M., Cahyono, M. A. D., Al Kori, U., & Safii, M. (2021). Pelatihan literasi digital pembelajaran jarak jauh untuk seluruh guru SD Negeri Sumbersekar Dau Malang. *BIDIK: Jurnal Pengabdian kepada Masyarakat*, 2(1), 20-30.
- Isharyanti, N., Dewi, F., & Jati, A. G. (2023). How ready can you be? Profiling Indonesian teacher's preparedness for an online teacher professional development program. *Voices of English Language Education Society*, 7(1), 167–178. <https://doi.org/10.29408/veles.v7i1.7905>
- Judijanto, L., Santika, T., Nurjanah, N., Suwandi, W., Sulaeman, S., & Rais, R. D. A. (2025). *Transformasi Pendidikan: Menghadapi Era Digital Di Ruang Belajar*. PT. Sonpedia Publishing Indonesia.
- Judrah, M., Arjum, A., Haeruddin, H., & Mustabsyirah, M. (2024). Peran guru pendidikan agama Islam dalam membangun karakter peserta didik upaya penguatan moral. *Journal of Instructional and Development Researches*, 4(1), 25-37.

- Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017–1054. <https://doi.org/10.1111/j.1467-9620.2006.00684.x>
- Moleong, L. J. (1990). Metodologi Penelitian Kualitatif (2000). *PT Remaja Rosdakrya, Bandung*.
- Nata, A., Rosyada, D., Rahiem, M. D. H., & Ugli, A. R. R. (2024). Digital extension of digital literacy competence for islamic religious education teachers in the era of digital learning. *Jurnal Pendidikan Agama Islam*, 21(2), 402–420.
- Redecker, C. (2017). *European framework for the digital competence of educators: DigCompEdu*. Publications Office of the European Union. <https://publications.jrc.ec.europa.eu/repository/handle/JRC107466>
- Rodi, Sesmiarni, Z., & Ismail, F. (2022). Mengembangkan kompetensi guru dalam menerapkan pembelajaran berdiferensiasi melalui komunitas praktisi. *Jurnal Penelitian Ilmu Pendidikan Indonesia*, 1(2), 463–469. <https://doi.org/10.31004/jpion.v1i2.75>
- Safaruddin, M. (2024). Evaluasi implementasi pelatihan jarak jauh (PJJ) di Balai Diklat Keagamaan Manado. *Transformasi*, 6(2), 112–126. <https://transformasi.kemenag.go.id/journal/article/view/316>
- Sugiarto, A., & Dewantara, J. A. (2021). Persepsi guru IPS Kota Singkawang terhadap literasi digital dalam mendukung kegiatan pembelajaran di Era Revolusi Industri 4.0. *Jurnal Basicedu*, 5(3), 1639-1651.
- Sugiyono, S. (2013). Metode penelitian kualitatif. bandung: Alfabeta. *Google Scholar Alfabeta*.
- Susanti, E. (2022). Upaya mengembangkan kompetensi guru dalam pembelajaran daring pada masa pandemi Covid-19 melalui pelatihan pembelajaran online di SD Negeri 008 Kampung Besar Kota Kecamatan Rengat. *Jurnal Pendidikan Tambusai*, 6(1), 1779–1792. <https://doi.org/10.31004/jptam.v6i1.3219>
- Wahyuni, K. D., Agustini, K., & Sudatha, I. G. W. (2024). Memahami Pelaksanaan Pelatihan Literasi Digital bagi Guru: Sebuah Tinjauan Literatur. *JIIP-Jurnal Ilmiah Ilmu Pendidikan*, 7(12), 14064-14071.
- Widhiyanti, S. (2024). *Pengembangan Kompetensi Professional Guru Melalui Pemanfaatan Platform Merdeka Mengajar di Taman Kanak Kanak se Kecamatan Cisoka Kabupaten Tangerang* (Master's thesis, Universitas Islam Negeri Saifuddin Zuhri (Indonesia)).
- Zulkifli, M. B., Tis'ah, J., Damayanti, S., & Nasrulloh, N. (2022). Pembelajaran daring dalam meningkatkan keaktifan siswa PAI. *Edukasi Islami: Jurnal Pendidikan Islam*, 11(1). <https://doi.org/10.30868/ei.v11i01.2139>