Kalijaga Journal of Islamic Religious Education
Vol. 1, No. 1, October 2025 | pp. 135-155
Available online at https://ejournal.uin-suka.ac.id/tarbiyah/jire

Pedagogical and Professional Competence of Islamic Religious Education Teachers in the Perspective of Technological Pedagogical and Content Knowledge (TPACK): A Comparative Study at MAN 2 Sleman and MAN 2 Bantul

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Received: 19-09-2025 **Revised: 13-10-2025** **Accepted: 14-10-2025**

ABSTRACT

This study was motivated by the importance of integrating content knowledge, pedagogy, and technology (TPACK) in learning, especially for Islamic Religious Education (IRE) teachers. The purpose of this study was to analyze the extent to which IRE teachers at MAN 2 Sleman and MAN 2 Bantul integrated pedagogical, professional, and technological competencies in the learning process. This study used a field design with a descriptive qualitative approach. There were four informants selected through purposive sampling, while data were collected through non-participant observation, semi-structured interviews, and documentation. The analysis was conducted using the Miles and Huberman interactive model and triangulation of sources and techniques to test the validity of the data. The results showed that IRE teachers at MAN 2 Sleman and MAN 2 Bantul had implemented the TPACK framework well, as reflected in their ability to design learning, understand student characteristics, master teaching materials, and utilize technology in an integrative manner. This implementation was supported by the availability of technological facilities, school policies, teacher capabilities, student support, and professional training, but still faced obstacles such as limited technological skills, infrastructure, time, and internet connectivity. This study recommends strengthening IRE teacher technology training and improving digital facilities.

Keywords: Pedagogical Competence, Professional Competence, Islamic Religious Education Teachers, TPACK.

ABSTRAK

Penelitian ini dilatarbelakangi oleh kondisi di lapangan yang menunjukkan bahwa sebagian guru Pendidikan Agama Islam (PAI) belum mampu menerapkan TPACK secara optimal akibat keterbatasan keterampilan teknologi, faktor usia, beban administratif, maupun minimnya dukungan fasilitas, sementara itu integrasi penguasaan konten, pedagogik, dan teknologi (TPACK) merupakan aspek penting yang harus dimiliki guru PAI. Tujuan penelitian adalah menganalisis sejauh mana guru PAI di MAN 2 Sleman dan MAN 2 Bantul mengintegrasikan kompetensi pedagogik, profesional, dan teknologi dalam proses pembelajaran. Penelitian

menggunakan desain lapangan dengan pendekatan kualitatif deskriptif. Informan penelitian berjumlah empat orang yang dipilih melalui purposive sampling, sedangkan data dikumpulkan melalui observasi non-partisipan, wawancara semi-terstruktur, dan dokumentasi. Analisis dilakukan dengan model interaktif Miles dan Huberman serta triangulasi sumber dan teknik untuk menguji keabsahan data. Hasil penelitian menunjukkan bahwa guru PAI di MAN 2 Sleman dan MAN 2 Bantul telah mengimplementasikan kerangka TPACK dengan baik, tercermin dari kemampuan merancang pembelajaran, memahami karakteristik siswa, menguasai materi ajar, dan memanfaatkan teknologi secara integratif. Implementasi ini didukung oleh ketersediaan fasilitas teknologi, kebijakan sekolah, kemampuan guru, dukungan siswa, serta pelatihan profesional, namun masih menghadapi kendala seperti keterbatasan keterampilan teknologi, infrastruktur, waktu, dan konektivitas internet. Penelitian ini merekomendasikan penguatan pelatihan teknologi guru PAI serta peningkatan fasilitas digital.

Kata Kunci: Kompetensi Pedagogik, Kompetensi Profesional, Guru Pendidikan Agama Islam, TPACK

INTRODUCTION

Education is a conscious and planned effort to provide guidance and assistance from adults to students, enabling them to optimally develop their physical and spiritual potential. Through education, it is hoped that students will become mature, independent individuals who can face various life challenges (Hidayat & Abdillah, 2019). This is in accordance with the National Education System Law (UU Sisdiknas) No. 20 of 2003, which emphasises that education is a conscious and planned effort to create a learning atmosphere and learning process that enables students to develop their potential actively. This potential encompasses religious and spiritual strength, self-control, personality, intelligence, noble character, and skills that are beneficial not only for the individual but also for the community, nation, and state (Republic of Indonesia, 2003). This legal basis emphasises that education aims to create a conducive learning environment that supports the development of all students' potential. Thus, education becomes an important instrument in shaping a generation that is intellectually and morally superior.

In achieving educational goals, teachers play a very important role (Hasanah, 2023). Teachers not only function as conveyors of subject matter but also as educators, mentors, and role models for students (Aulia et al., 2025; Rokhimawan et al., 2023). This role becomes even more complex when it comes to Islamic Religious Education (IRE) teachers. IRE teachers are required not only to master and teach religious knowledge theoretically (Abidin, 2014), but also to instil Islamic values that promote the formation of noble character. Therefore, IRE teachers have a dual responsibility, namely as conveyors of knowledge (transfer of knowledge) and instillers of values (transfer of values) so that students can internalise Islamic teachings in their daily lives (Achmad, 2022). At the Madrasah Aliyah (MA) level, IRE teachers teach various

important subjects including the Qur'an Hadith, Aqidah Akhlak, Fiqh, and Islamic Cultural History. All of these subjects not only enrich students' religious knowledge but also contribute greatly to shaping the personality, attitude, and Islamic character of the younger generation.

Islamic Religious Education Teachers (IREs) are required to possess various competencies to carry out their complex roles effectively. Based on the Decree of the Minister of Religious Affairs of the Republic of Indonesia Number 211 of 2011 concerning Guidelines for the Development of National Standards for Islamic Education in Schools, there are six areas of competency development for IRE teachers at all levels of education, including pedagogical competencies, personal competencies, social competencies, professional competencies, spiritual competencies, and leadership competencies (Directorate General of Islamic Education, Ministry of Religious Affairs, 2012). Of these six competencies, there are two that IRE teachers should master: pedagogical and professional competencies. This enables IRE teachers to design, implement, and evaluate learning that not only focuses on cognitive aspects but also emphasises the formation of character and the internalisation of Islamic values. The pedagogical competency of IRE teachers includes understanding the characteristics of students, mastery of learning theories, curriculum development, implementation of educational learning, and reflection to improve the quality of learning. Meanwhile, the professional competence of IRE teachers requires a deep mastery of IRE material, the ability to develop learning materials creatively, and the ability to continuously improve professionalism through reflection and the use of information technology (Minister of Religious Affairs of the Republic of Indonesia, 2011). These two competencies are important foundations for IRE teachers, especially in facing the challenges of 21st-century education, which is characterised by rapid technological developments (Graham, 2011).

The development of information and communication technology has brought about major changes in the world of education. Technology is no longer just a supplement; it has become a necessity that must be integrated into the learning process. The use of technology can make the learning process more interesting, interactive, and relevant to the needs of students in the digital age. One conceptual framework that is often used to understand the integration of technology in learning is Technological Pedagogical and Content Knowledge (TPACK). The TPACK concept introduced by Mishra and Koehler is a development of Shulman's idea about the importance of synergy between content and pedagogical knowledge (Koehler, Mishra, Hershey, & Peruski, 2004). TPACK adds the aspect of technology to form a comprehensive understanding of the interaction between content (Content Knowledge/CK), pedagogy (Pedagogical Knowledge/PK), and technology (Technological Knowledge/TK) (Koehler & Mishra, 2005). The combination of these three aspects

yields new knowledge, such as Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and a comprehensive combination known as TPACK (Rahmadi, 2019). With TPACK, teachers are expected to be able to manage learning that is in harmony between content, pedagogical strategies, and the use of technology (Archambault & Barnett, 2010).

In the context of Islamic Education, the application of TPACK is highly relevant because it can facilitate teachers in delivering religious material more contextually and interestingly. The implementation of TPACK requires not only mastery of material and teaching strategies, but also the skills to effectively utilise technology to support the learning process (Purwaningsih, 2016). The use of technology can help enrich the methods of delivering material, for example, through interactive digital media, learning applications, or online platforms. Thus, students can more easily understand the material presented and be more motivated to learn (Asiyah & Fahmi Jazuli, 2022). However, the reality in the field shows that not all IRE teachers can optimally apply TPACK. Conventional methods still limit some teachers due to a lack of technological skills, age factors, administrative burdens, or inadequate facility support (Rizal, Yakin, & Saparudin, 2023). In addition, other factors such as training, teacher self-efficacy, school culture, and educational institution policies also determine the extent to which TPACK can be implemented properly (Maryono, 2020; Susilowati, 2021).

Several previous relevant studies show that the integration of TPACK in IRE learning has been widely studied, although the focus and scope vary. For example, Rizal's (2023) study focused on implementing TPACK to increase student activity at SMKN 5 and MAN 2 Mataram, employing a descriptive-comparative approach. The results show that the success of TPACK implementation is influenced by the availability of facilities and teachers' ability to integrate technology, pedagogy, and content. Another study, conducted by Ningrum (2024) at SDN Kota Bangun, examined the impact of TPACK on improving the pedagogical and professional competencies of IRE teachers through a phenomenological approach. In contrast, this study focuses more on student activity as an indicator of success.

In addition, research conducted by Ritonga, et al., (2023) also provides an important overview of IRE teachers' ability to apply TPACK. Their research results show that TK = 74.55% (good), PK = 78.85% (good), CK = 75.30% (good), TPK = 72.31% (good), TCK = 75.30% (good), PCK = 78.85% (good), and TPACK = 75.40% (good) (Ritonga et al., 2023). These findings indicate that IRE teachers are in the good category in understanding and applying technological developments in the learning process. The implication is that students can more easily understand the material through visual-based technology, making it easier to remember and facilitating the achievement of learning objectives. Thus, this study confirms that IRE teachers' mastery of TPACK plays a crucial role in facilitating student understanding and supporting the optimal

achievement of learning objectives. Although the three studies above emphasise the importance of TPACK, most are still limited to analysing implementation and partial impacts on teacher competence or student learning outcomes.

This study is unique because it focuses on the integration of pedagogical and professional competencies of Islamic Education teachers in the context of TPACK at the Madrasah Aliyah level, particularly at MAN 2 Sleman and MAN 2 Bantul. A study by Rusmiyasih (2020) highlights the influence of pedagogical and professional competencies on teacher performance, employing a quantitative approach. In contrast, this study emphasises a qualitative exploration to understand how these two competencies interact integrally in the application of TPACK. Similarly, the studies by Nurul (2023) and Annisa (2024) only describe teachers' abilities in certain aspects of TPACK or within specific curricula, without emphasising the explicit relationship between pedagogical and professional competencies. Thus, there is still room for further study to examine more comprehensively how the pedagogical and professional competencies of IRE teachers can synergise within the TPACK framework.

This study aims to fill this gap by focusing on the integration of pedagogical and professional competencies of Islamic Education teachers in the context of TPACK implementation in Madrasah Aliyah, particularly in MAN 2 Sleman and MAN 2 Bantul. MAN 2 Sleman is recognised as a research-based, inclusive madrasah that has a policy of requiring all teachers to master technology, including providing facilities such as digital devices in the classroom (Azizah, 2024; MAN 2 Sleman, 2021). Meanwhile, MAN 2 Bantul excels in the field of skills with its Prodistik program and SMART MANDABA (MAN 2 Bantul Technology-Based Learning System) innovation, which encourages teachers and students to be more adaptive to technological developments (Susana, 2025; Smart Mandaba Team, 2024). These two madrasahs serve as examples of how the educational environment can impact teachers' ability to implement TPACK.

Based on this description, the researcher was interested in examining the pedagogical and professional competencies of IRE teachers in the context of TPACK at MAN 2 Sleman and MAN 2 Bantul. This study aims to analyse the extent to which IRE teachers at MAN 2 Sleman and MAN 2 Bantul are able to integrate pedagogical, professional, and technological knowledge in learning. The results of this study are expected to provide an empirical description of the strengths and weaknesses of IRE teachers in applying TPACK, as well as to formulate strategies for improving the quality of IRE learning that are more innovative, effective, and relevant to modern educational needs. In addition, this study is expected to contribute to enriching academic studies on TPACK, particularly in Islamic Religious Education subjects at the Madrasah Aliyah level, thereby providing practical and theoretical solutions for the development of religious education in Indonesia.

METHODS

This study uses a field research design with a descriptive qualitative approach. According to Moleong (2021), qualitative research aims to understand the phenomena experienced by research subjects, such as behaviour, perceptions, motivations, and actions, holistically and descriptively, in the form of words or language, within a specific natural context. Qualitative descriptive research aims to provide an in-depth description of reality in the field, without any manipulation or specific conditioning from the researcher (Sukmadinata, 2011). In this study, the researcher serves as the primary instrument for collecting data through direct interaction with informants. The focus of the research is on examining the pedagogical and professional competencies of IRE teachers in the context of TPACK, as demonstrated by the learning practices that naturally occur in madrasahs. This research was conducted in two locations: MAN 2 Sleman and MAN 2 Bantul. The research period lasted four months, from January to April 2025.

The population in this study consisted of all teachers of Islamic Education subjects teaching at both research locations, including teachers of Al-Qur'an Hadith, Aqidah Akhlak, Fiqh, and Islamic History and Culture (SKI). The research locations were selected purposively, taking into account their relevance to the research topic/theme. MAN 2 Sleman was selected because it is known as the first research-based inclusive madrasah in Indonesia with educational technology support. In contrast, MAN 2 Bantul was selected because it is characterised as a madrasah with additional digital skills through the Prodistik program and the SMART MANDABA technology-based learning system. Research informants were determined using purposive sampling techniques with specific criteria, namely (1) having a minimum academic qualification of Bachelor's Degree (S1), (2) having the status of Civil Servant (ASN), both PNS and P3K, and (3) having professional certification (optional). Based on these criteria, four IRE teachers were identified as eligible research informants, two from MAN 2 Sleman and two from MAN 2 Bantul.

Data collection was conducted using three primary techniques: observation, interviews, and documentation. Observation was carried out in a non-participatory manner, where researchers acted as observers without being directly involved in the learning activities (Rahmadi, 2011). This observation focused on observing the actual practices of IRE teachers' pedagogical and professional competencies in integrating TPACK. Interviews were conducted using a semi-structured technique, which allowed flexibility in asking questions according to guidelines while remaining open to exploring more in-depth answers (Sugiyono, 2023). The interviews focused on exploring teachers' experiences, strategies, and challenges in applying TPACK in IRE learning. Documentation was used to complement the observation and interview data, including learning tools (teaching modules, analysis of learning outcomes and

objectives, reflection journals, annual programs), student assessment records, and evidence of professional development administration, such as teacher training certificates. The three techniques were implemented in an integrated manner to produce more comprehensive and credible data.

Data analysis in this study used Miles and Huberman's (1992) interactive model, which consists of four stages, namely: (1) data collection, which involves gathering data from observations, interviews, and documentation; (2) data reduction, which involves summarizing, selecting, and focusing on important information relevant to the research objectives; (3) data presentation, which involves compiling the reduced data into narratives, matrices, or charts to facilitate understanding; and (4) concluding/verification, which involves interpreting the data to find patterns, meanings, and relationships between pieces of information. This study used source triangulation and method triangulation to ensure data validity (Sugiyono, 2023). Source triangulation was conducted by comparing data from several Islamic education teachers at both research locations. In contrast, technique triangulation was conducted by matching the results of observations, interviews, and documentation from the same data sources. Through this procedure, credible, consistent, and accountable data were obtained to describe the implementation of TPACK by IRE teachers at MAN 2 Sleman and MAN 2 Bantul.

RESULT AND DISCUSSION

In Islamic Religious Education (IRE) learning, the integration of pedagogical, professional, and technological competencies is crucial to creating an effective and relevant learning experience. The Technological Pedagogical Content Knowledge (TPACK) model offers a framework that harmoniously combines these three aspects.

1. Integration of Pedagogical, Professional, and Technological Competencies in Islamic Education Learning at MAN 2 Sleman

The pedagogical competence of Islamic Education (IRE) teachers at MAN 2 Sleman is reflected in their mastery of Pedagogical Knowledge (PK). Teachers have demonstrated the ability to develop systematic and structured lesson plans through the use of teaching modules that contain important components such as Learning Outcomes (CP), Learning Objectives (TP), and Learning Objective Flow (ATP). This planning not only fulfils administrative aspects but is also adaptive to student needs and curriculum requirements. This aligns with the results of interviews and documentation, which show that teachers prepare learning tools at the beginning of the semester and compile well-organised teaching modules (Azizah, 2025). This suggests that teachers possess a profound understanding of the importance of planning as a foundation for effective learning implementation.

In addition, to understand student characteristics, IRE teachers at MAN 2 Sleman use initial assessments and direct observation. Initial assessments, such as those conducted through the Quizizz platform, enable teachers to determine students' initial level of understanding before teaching the material (Azizah, 2025). The results of these assessments then become the basis for teachers to adjust their learning strategies. In addition, observations show that teachers begin learning by identifying students' difficulties and providing the necessary clarification ('Abid, 2025). This reflects the application of the principle of differentiated learning and the flexibility of teachers in accommodating diverse learning styles.

The learning strategies and methods employed by teachers are diverse, encompassing various approaches such as problem-based learning, case-based learning, interactive discussions, and inquiry-based learning (Alqoma, 2025). These strategies enable the teaching material to be related to students' daily lives, while encouraging them to think critically and actively participate in discussions. Observations support these findings by showing how teachers present real cases as material for analysis, thereby creating more lively and student-centred classroom interactions ('Abid, 2025).

Pedagogical competence is also reflected in the implementation of learning assessments. Teachers not only conduct cognitive assessments, but also involve aspects of attitude and skills through self-observation journals, peer assessments, and daily assessments. In addition, teachers utilise the Jogja Madrasah Digital (JMD) platform as a Learning Management System to carry out formative assessments, which enable faster, more transparent, and more efficient evaluation results (’Abid, 2025). This demonstrates that teachers can effectively combine conventional and technology-based approaches in learning evaluation.

On the other hand, in terms of Technological Pedagogical Knowledge (TPK), IRE teachers at MAN 2 Sleman actively utilise technological devices, such as projectors, dongles, and application-based learning media (Mentimeter, Quizizz, and JMD) (Azizah, 2025). Observations indicate that the use of these technologies fosters a more engaging learning experience and motivates students. This confirms that teachers not only possess conventional pedagogical skills but are also able to integrate technology to enhance the quality of learning.

The professional competence of IRE teachers at MAN 2 Sleman is reflected in their mastery of Content Knowledge (CK). The results of interviews and observations indicate that teachers possess a profound understanding of complex IRE material, which is supported by their formal and non-formal educational backgrounds, including Islamic boarding schools. Teachers also actively update the material through additional sources, both from printed and digital references, so that the material taught remains relevant and contextual (Azizah, 2025).

Teachers' professionalism is also demonstrated through the use of various learning resources. Not only do teachers rely on textbooks provided by the government, but they also utilise e-books, worksheets, research results, classical and contemporary books, online videos, and inspirational stories (Alqoma, 2025; Azizah, 2025). This approach enriches students' learning experiences while linking the material to everyday life, making the learning process more meaningful.

Efforts to develop teacher professionalism are also evident in their involvement in training, workshops, and MGMP forums. Teachers are required to attend at least one training session per month through the Ministry of Religious Affairs' PINTAR platform and annual madrasah programs. Additionally, the MGMP forum serves as a strategic platform for sharing learning practices, discussing, and continually updating competencies (Alqoma, 2025). This demonstrates the teachers' commitment to developing professionalism as a means to enhance the quality of learning.

In addition, in the context of Technological Content Knowledge (TCK), IRE teachers at MAN 2 Sleman can develop technology-based teaching materials. One such practice is the use of the Pictory AI application to create learning videos with added voiceovers, making them more personal and interactive (Azizah, 2025). Furthermore, teachers also use PowerPoint as a visual medium to support learning. This confirms that teachers not only master the substance of the material but are also able to package it in innovative digital media formats.

The integration of teachers' pedagogical and professional competencies is reflected in their mastery of Technological Knowledge (TK). IRE teachers at MAN 2 Sleman view technology as a necessary tool for enhancing learning effectiveness. The use of devices such as projectors, dongles, and the JMD platform demonstrates teachers' ability to operate technology effectively. Without the use of technology, learning is considered less relevant to the needs of today's students (Alqoma, 2025). This demonstrates that teachers can effectively combine pedagogical, professional, and technological knowledge to facilitate more contextualised learning.

The aspect of Pedagogical Content Knowledge (PCK) is also evident in learning practices. Teachers have demonstrated the ability to connect mastery of material with appropriate pedagogical strategies. For example, abstract religious and moral material is explained through videos and PowerPoint presentations to bridge students' understanding. This strategy not only helps students understand complex concepts but also fosters interaction through discussion and question-and-answer sessions (’Abid, 2025). This demonstrates that teachers can select learning methods that are aligned with the nature of the teaching material.

In addition, in the context of TPACK, teachers have been able to combine three main components, namely content, pedagogy, and technology. Teachers use PowerPoint to deliver material, JMD for digital-based evaluation, and Quizizz, Kahoot, and Google Form applications for interactive assessment. These strategies are also adjusted based on grade level, for example, the use of competitive quizzes for 10th grade, video analysis for 12th grade, and faith-based discussions for 11th grade (Alqoma, 2025). This integration demonstrates the flexibility of teachers in designing relevant, engaging, and meaningful learning experiences.

Overall, the results of the study show that IRE teachers at MAN 2 Sleman have comprehensively integrated pedagogical and professional competencies within the TPACK framework. They are able to combine mastery of material, learning strategies, and the use of technology to create an interactive, contextual learning process that meets the demands of 21st-century education.

2. Integration of Pedagogical, Professional, and Technology Competencies in IRE Learning at MAN 2 Bantul

The pedagogical competence of IRE teachers at MAN 2 Bantul, as reflected in the TPACK framework, is evident in their ability to develop lesson plans, understand student characteristics, determine learning strategies and methods, and conduct evaluations using technology-based pedagogical approaches.

Teachers develop lesson plans in accordance with the applicable curriculum, even though MAN 2 Bantul implements a block system. Teachers continue to develop teaching modules, lesson plans (RPP), and syllabi in accordance with the principles of the independent curriculum, including the development of learning objective sequences (ATP). Interviews with Islamic Cultural History (SKI) teachers reveal that the development of learning tools encompasses not only formal administration but also addresses the hidden curriculum, utilising digital platforms for storage and reporting (Khuzaifa, 2025). This is reinforced by the documentation of teaching modules, which demonstrate the integration of innovation values, character building, and moderation. Thus, teachers are able to develop learning tools that are not only in accordance with regulations but also contextual and relevant to students' needs (Nasution, Nurhayati, & Rahim, 2024).

Then, the understanding of Islamic Education teachers regarding student characteristics becomes an important aspect. Islamic Education teachers utilise diagnostic assessments, as stated by the Al-Qur'an Hadith teacher, by asking random questions to measure students' level of understanding (Kartikaningrum, 2025). This method allows teachers to tailor learning strategies to individual needs. Although assessments are not conducted at every meeting, this flexible approach highlights the ability of teachers to tailor learning to the diverse characteristics of students.

The implementation of learning at MAN 2 Bantul demonstrates the creativity of teachers, who combine various strategies and methods, such as case-based learning, interactive lectures, discussions, and mini-dramas that address themes of everyday life. SKI teachers, for example, apply active learning strategies, as referred to by Silberman (2007), one of which emphasises a case-based learning approach (Khuzaifa, 2025). Meanwhile, Al-Qur'an Hadis teachers allocate special time for interactive discussions and mini-drama activities as a means of strengthening religious values (Kartikaningrum, 2025). Classroom observations show that teachers also encourage two-way interaction by allowing students to ask and answer questions, which reflects active and participatory learning ('Abid, 2025).

The learning evaluation stage is conducted using the Smart Mandaba platform, an e-learning system owned by the madrasah. Teachers upload daily tests, Mid-Semester Assessments (PTS), and Final Semester Assessments (PAS) in digital format that students can access online. The types of questions used varied, ranging from multiple choice to essay questions (Kartikaningrum, 2025). This indicates that teachers have integrated technology-based evaluations that support the objective and efficient measurement of learning outcomes (Tanjung, Hutagalung, & Adisaputera, 2025).

In addition to conventional pedagogical aspects, IRE teachers at MAN 2 Bantul also demonstrate mastery of Technological Pedagogical Knowledge (TPK). The use of technology is not limited to presentation media but also to increasing student engagement. Al-Qur'an Hadis teachers, for example, instruct students to create learning videos using the Canva application or popular social media platforms such as TikTok (Kartikaningrum, 2025). SKI teachers use a wheel of names as an interactive tool for random student selection, accompanied by music played through active speakers to enhance the classroom atmosphere. This implementation confirms teachers' ability to combine technology and pedagogy to create dynamic learning environments (Mishra & Koehler, 2006).

The professional competence of IRE teachers at MAN 2 Bantul is reflected in the aspects of Content Knowledge (CK) and Technological Content Knowledge (TCK), which are at the core of professionalism in TPACK. Teachers not only have a deep understanding of the material, but are also able to package learning content using technology.

The mastery of material by IRE teachers at MAN 2 Bantul demonstrates a deep understanding of each field of study in IRE, including fiqh, aqidah, akhlak, and Al-Qur'an and Hadith. SKI teachers emphasise the importance of understanding the substance of the material, while Al-Qur'an Hadith teachers reveal that they actively update their knowledge through trends, academic literature, and discussions with senior scholars (Kartikaningrum, 2025; Khuzaifa, 2025). This

demonstrates a continuous commitment to mastering and updating content knowledge to remain current and relevant.

Then, the use of various learning resources was evident, including Student Worksheets (LKS), e-books, classical books such as Manna Al-Qathān and Arba'in Nawawi, and videos from social media, as case studies. Learning observations revealed that teachers utilised videos from social media to enhance learning materials, making them more contextual. Thus, students gain a broader and more meaningful learning experience (Dendodi, Qonitah, Nurahlina, & Aprilia, 2025).

Additionally, the development of teacher professionalism is facilitated through participation in training and scientific forums. SKI teachers, for example, actively participate in both online and offline training, and from January to March 2025, they attended 22 training sessions. Furthermore, involvement in the Subject Teacher Working Group (MGMP) is also an important means of sharing experiences, updating knowledge, and formulating relevant learning strategies. Involvement in this forum demonstrates teachers' commitment to continuous professional development (Suhendri, 2023).

Teachers' professionalism is also reflected in Technological Content Knowledge (TCK), where teachers effectively utilise technology to develop teaching content. Al-Qur'an Hadis teachers, for example, compile materials in PowerPoint and PDF formats that are provided each time they complete a chapter. Classroom observations reveal that the material taught is derived from official textbooks and then presented in the form of presentations to facilitate students' understanding. Thus, technology serves not only as a visual aid but also as a means of organising material more systematically and engagingly (Aliyah & Masyithoh, 2024).

The integration of pedagogical and professional competencies of IRE teachers at MAN 2 Bantul is evident in the utilisation of Technological Knowledge (TK), Pedagogical Content Knowledge (PCK), and the comprehensive application of Technological Pedagogical and Content Knowledge (TPACK).

Teachers' mastery of technological aspects demonstrates their awareness of the importance of technology as a learning support tool. Al-Qur'an and Hadith teachers emphasise that technology facilitates the learning process and increases student participation through media such as PowerPoint, digital games, and interactive platforms. This is reinforced by evidence of a certificate of training in artificial intelligence (AI)-based learning media that teachers attended in June 2024, with a result of "highly competent" ('Abid, 2025). This means that teachers not only master technology but also actively develop themselves through professional training.

PCK skills are also reflected in how teachers relate teaching materials to appropriate learning strategies. SKI teachers, for example, employ a case study

approach by relating local figures who spread Islam in Yogyakarta, making it more relevant to students' lives (Khuzaifa, 2025). Classroom observations reveal that teachers employ interactive strategies tailored to the material's characteristics, facilitating students' understanding of the learning content within a real-world context.

Furthermore, the comprehensive implementation of TPACK is evident in the teaching of the Qur'an and Hadith, where teachers integrate content with technology and pedagogical strategies. Teachers use popular films to convey Islamic values, such as responsibility and trust, and utilise PowerPoint presentations, videos from social media, and audio devices to support classroom interaction. Learning observations indicate that this strategy motivates students to become more enthusiastic and active. This demonstrates the teachers' mastery of TPACK as a whole, specifically their ability to deliver IRE content with an appropriate pedagogical approach while utilising technology to enhance the quality of learning (Mishra & Koehler, 2006).

Overall, the results of the study indicate that IRE teachers at MAN 2 Bantul have comprehensively implemented pedagogical and professional competencies within the TPACK framework. The integration of technology, pedagogy, and content not only supports learning effectiveness but also creates a learning experience that is relevant, contextual, and engaging for students.

3. Supporting and Inhibiting Factors for IRE Teachers at MAN 2 Sleman and MAN 2 Bantul in Implementing TPACK

The implementation of TPACK by IRE teachers at MAN 2 Sleman and MAN 2 Bantul is influenced by supporting and inhibiting factors. These factors play a crucial role in determining the success or limitations of teachers in integrating technological, pedagogical, and content aspects into the learning process. Based on the results of interviews, observations, and analysis of research data, the following is a detailed description of the factors that influence the implementation of TPACK by IRE teachers.

Supporting Factors for TPACK Implementation. First, the availability of adequate technological facilities is a key factor that supports the successful implementation of TPACK. Teachers have access to learning support devices, including projectors in each classroom, dongles, computer laboratories, smooth internet access, and smart TV devices. This aligns with the results of interviews with Al-Qur'an Hadith subject teachers at MAN 2 Sleman, who confirmed that each classroom is equipped with technological facilities, enabling teachers to integrate them into their teaching easily. Observations at both madrasahs also showed that these technological facilities were not only available but also used optimally by teachers. The availability of these facilities supports the creation of learning that is

more effective, interesting, and relevant to the needs of students. In line with the findings at MAN 2 Sleman and MAN 2 Bantul, Mas'un's (2022) research at MAN 1 Sumbawa also demonstrates that adequate technological facilities, such as stable internet access and multimedia devices, are crucial factors in implementing TPACK-based learning. Teachers who have easy access to technology tend to be more effective in integrating technology into IRE learning (Mas'un, 2022).

Second, school policies that support the use of technology also play a significant role. These policies, such as the requirement for teachers to master information technology, motivate teachers to be more open to the digitisation of learning. Statements from teachers of Islamic Ethics and the Qur'an and Hadith at MAN 2 Sleman indicate that the madrasah principal's policies encourage teachers to learn technology and apply it in the teaching process.

Third, teachers' ability and comfort in using technology is another factor that strengthens the application of TPACK. Teachers who feel comfortable using digital devices, such as PowerPoint, projectors, and audiovisual media, demonstrate greater flexibility in delivering material. Interviews with Al-Qur'an Hadith teachers at MAN 2 Sleman and SKI teachers at MAN 2 Bantul confirm that the use of technology is not only considered helpful but also provides added value in creating a more lively learning atmosphere. Classroom observations reveal that nearly all teachers are proficient in utilising digital devices, enabling the optimal integration of technology with pedagogy and content.

Fourth, student support is an important factor in encouraging the implementation of TPACK. Students who are familiar with technology, particularly the use of gadgets, tend to be more enthusiastic when teachers incorporate digital media into their teaching. Interviews with Akidah Akhlak teachers at MAN 2 Sleman revealed that it is easier to direct students to positive technology-based activities than to prohibit the use of their devices. Observations of SKI learning at MAN 2 Bantul also showed that students were more active when teachers used technology-based learning platforms. This suggests that student support and enthusiasm facilitate teachers' ability to deliver interactive learning (Purwanto & Hasjiandito, 2025).

Fifth, teacher training and professional development contribute to improving TPACK competence. IRE teachers at both madrasahs had the opportunity to participate in training related to information technology development, both through internal madrasah activities and external institutions. Interviews with teachers at MAN 2 Bantul revealed hopes that digital training could be conducted more frequently so that teachers would not be left behind by technological developments. This finding reinforces Budiarti's (2024) research, which suggests that even though teachers already possess an adequate

understanding of pedagogy and content, further strengthening is needed in the area of technology, particularly through continuous training and support.

Although various factors support the successful implementation of TPACK, several obstacles are also faced by IRE teachers. *First*, limited technological facilities are a major obstacle. Although basic equipment is available, teachers still complain about the lack of advanced facilities, such as special learning rooms with smart TVs. Interviews with Al-Qur'an Hadith teachers at MAN 2 Sleman show that learning still relies on simple devices. This limits teachers' ability to innovate in creating a more in-depth learning experience.

Second, infrastructure and resource constraints are also obstacles. Several teachers reported damage to devices, including LCDs, unstable electricity, and unreliable Wi-Fi connections. SKI teachers at MAN 2 Bantul even mentioned that teachers often use their personal data when the school network is inadequate. The lack of infrastructure maintenance means that the potential of technology is not being optimally utilised.

Third, social and behavioural issues among students pose a unique challenge. Teachers often find it challenging to supervise students when technology-based learning is fully in progress. Some students are distracted by other activities, such as playing games or accessing social media. The Akidah Akhlak teacher at MAN 2 Sleman emphasised that limited supervision makes it easy for students to get distracted. The Al-Qur'an Hadith teacher at MAN 2 Bantul expressed a similar view, saying that students are often more interested in digital entertainment. This condition highlights the need for effective classroom management strategies to ensure that technology is used productively (Harris & Hofer, 2011).

Fourth, limited time and teacher preparation also hinder the implementation of TPACK. The IRE teacher at MAN 2 Bantul stated that preparing technology-based learning requires more time, both for designing materials and adjusting strategies. Limited time has an impact on the suboptimal integration of technology with pedagogy and content.

Fifth, connectivity issues and limitations in student devices pose significant obstacles. Quran Hadith teachers at MAN 2 Bantul stated that many students from lower-middle-class backgrounds experience difficulties in accessing digital learning due to limited internet quotas and inadequate devices. This condition prevents all students from participating optimally in technology-based learning. This finding aligns with the results of Zhao's (2024) research, which concluded that the digital divide has an impact on differences in desired learning outcomes (Zhao, 2024).

Thus, the research results indicate that the implementation of TPACK by IRE teachers at MAN 2 Sleman and MAN 2 Bantul is progressing quite well, thanks to

the support of technological facilities, school policies, teacher comfort, student enthusiasm, and the availability of training. However, limitations in advanced facilities, infrastructure problems, student behaviour, time constraints, and students' economic constraints remain obstacles that need to be overcome so that the application of TPACK can be more optimal and sustainable.

The results show that both schools have successfully integrated technology, pedagogy, and content into the IRE learning process, although there are differences in the level of implementation. The results of this analysis are illustrated in the following Venn diagram:

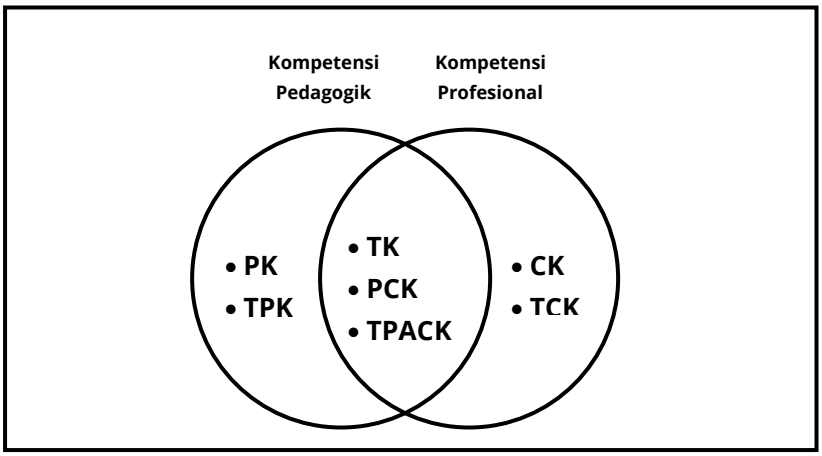

Figure 7. Analysis of Pedagogical Competence Distribution and Professional Competence Implementation in the Context of TPACK

Based on the division in the figure, pedagogical competence encompasses the components of Pedagogical Knowledge (PK) and Technological Pedagogical Knowledge (TPK). Then, in terms of professional competence, it includes the components of Content Knowledge (CK) and Technological Content Knowledge (TCK). Meanwhile, in terms of integrating both competencies, it encompasses Technological Knowledge (TK), Pedagogical Content Knowledge (PCK), and Technological Pedagogical Content Knowledge (TPACK).

CONCLUSION

Islamic Education (IRE) teachers at MAN 2 Sleman and MAN 2 Bantul have successfully integrated pedagogical, professional, and technological competencies through the TPACK framework, making learning more interactive, contextual, and relevant to the needs of 21st-century students. The use of digital media, learning applications, and various pedagogical strategies demonstrates the flexibility of teachers in delivering IRE content effectively. Despite obstacles such as limited advanced facilities, infrastructure, and preparation time, teachers are still able to utilise existing resources and participate in professional training to improve the quality of learning. This approach demonstrates that integrating technology, pedagogy, and

content not only enriches the learning experience of students but also supports the continuous professional development of teachers.

The implications of these findings suggest that TPACK can serve as a practical guide for IRE teachers in designing innovative and adaptive learning experiences. Further development can focus on the application of TPACK in collaborative learning, technology-based evaluation, and adapting methods to various grade levels and madrasah conditions. This strategy not only improves learning effectiveness but also provides opportunities for further research to explore the integration of technology in the broader context of religious education.

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