DEVELOPING TPACK OF EFL TEACHERS IN ISLAMIC BOARDING SCHOOLS THROUGH A TPACK-BASED COURSE

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Abstract: Numerous studies have delved into TPACK framework integration in EFL regular classrooms, but less studies have researched its implementation in an Islamic boarding school setting. This study aims to investigate the impact of a TPACK-based course on the understanding and application of TPACK of EFL teachers in Islamic boarding schools in the Indonesian context. This qualitative study was conducted within six months from July 2024 to December 2024. The participants were four female EFL teachers at two Islamic boarding schools in Lamongan, East Java, Indonesia. This study collected data from multiple sources, including classroom observations, interviews, documents, and audiovisual materials. The research findings reveal that the course positively impacted teachers' TPACK development, especially in terms of technological domains and the teachers' ability to integrate technology into their teaching. Furthermore, the course has fostered a shift from traditional, teacher-centered practices to more dynamic, student-centered approaches. While barriers such as limited access to resources and lacks of creativity and innovation in utilizing technology posed challenges, the teachers' increased confidence in using digital tools and their proactive approach to overcoming obstacles were clear indicators of the course's success.

Keywords: EFL teachers, Islamic boarding school, professional development, TPACK, TPACK-based course

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A significant milestone in educational technology is an integrated framework that brings together technology, teaching methods, and subject matter expertise. In 2006, Mishra and Koehler introduced a framework known as "Technological Pedagogical Content Knowledge," abbreviated as TPCK (Mishra & Koehler, 2006). Over time, TPCK was renamed TPACK (pronounced tee-pack) (Schmidt et al., 2009). The existence of the TPACK framework emphasizes the understanding of educators regarding how to effectively deliver learning content through the use of technology, utilizing strategies that are contextually appropriate (Shi & Jiang, 2022). According to the TPACK framework, technology integration is viewed as a complex process that necessitates an understanding of the dynamic and reciprocal relationships among three knowledge domains: pedagogy, content, and technology (Cahyono et al., 2016). TPACK emphasizes that effective technology integration by educators requires not only a

strong understanding of each domain but also an awareness of how these domains interact, which informs the planning and implementation of technology-enhanced teaching and learning activities (Petko et al., 2024).

Worldwide, numerous studies have delved into TPACK framework integration in classrooms, in which the majority was taking place in regular schools (Hayati & Zaim, 2024; Hill & Uribe-Florez, 2020; Loi, 2021; Wang, 2024; Wu et al., 2022). Therefore, less is known about how EFL teachers in Islamic boarding schools deal with TPACK in their teaching. Islamic boarding schools are educational institutions that offer a distinctive environment, where students reside together in a dormitory setting while receiving Islamic education (Asy'arie et al., 2023). Since Islamic boarding schools are frequently considered traditional or classical educational institutions due to their continued adherence to conventional methods, such as memorization, passive listening, and note-taking (Ma'ruf et al., 2024), integrating technology as in TPACK framework may become a considerable challenge for the teachers. Additionally, a common policy in Islamic boarding schools is the restricted access to technology, including limited or no internet connectivity, as well as the prohibition of personal electronic devices, which worsens the situation amidst the current trend of technologically-based educational practices.

Our preliminary research conducted in early March 2024 involved ten EFL teachers in some Islamic boarding schools in Lamongan regency, Indonesia. The teachers expressed their beliefs in the importance of integrating technology into the teaching and learning process. However, they reported being unable to optimally implement it. Some researchers have identified that the lack of technology integration in Islamic boarding schools may stem from various institutional factors, including limited infrastructure (Rizal et al., 2024), inadequate training (Mashur et al., 2021), lack of access to and insufficient technical support (Taopan et al., 2020), and compatibility issues with regard to institutional policies (Habibi et al., 2020). Other teachers noted that they sometimes lack the knowledge required to integrate technological devices. In this context, factors such as insufficient knowledge (Nasution et al., 2024), preparation time, and the complexity of technology integration (Wajdi et al., 2024) are very likely to become barriers. On the other hand, as in the era of Industry 4.0, educators are expected to effectively integrate technology into their teaching, ensuring that students possess the competencies necessary to utilize technology effectively.

In response to the challenges faced by EFL teachers in such settings, we proposed a TPACK-based course aimed at enhancing TPACK competence, in accord with what has been purported by Sullam (2020) stating that in order for EFL teachers in Islamic boarding schools to maintain competitiveness in this era, they need to adapt learning materials, methods and strategies, as well as learning media to align with technological advancements. Previously, TPACK-based courses were specifically designed for science student teachers and consisted of three key phases: the introduction to TPACK (Phase 1), the development of Technological Knowledge (TK), Technological Pedagogical Knowledge (TPK), and Technological Content Knowledge (TCK) (Phase 2), and the development of TPACK itself (Phase 3) (Tanak, 2019). Additionally, another type of TPACK course for science student teachers, known as the "TPACK Development Course" (TPACK-DC), was implemented in three stages: a training

course, the creation of lesson plans for use in microteaching, and the application of these plans in school settings (Aktas & Özmen, 2020). Other researchers have also developed TPACK-based courses for pre-service teachers (Bwalya et al., 2024; Cahyono et al., 2016; Durdu & Dag, 2017; Loi & Hang, 2021; Sahrir et al., 2021). Notably, the previous course designs are often easily adaptable within formal educational settings. However, there is only limited literature discussing TPACK-based course for in-service teachers in the Islamic boarding schools setting.

Against the backdrop, the present study seeks to fill in the gap by conducting TPACK-based course in the context of Islamic boarding schools through a specialized course called TPACK for EFL Teachers in *Pesantren* (Islamic boarding schools) or TPACK-ETP. Specifically, this study aims to address the following research question: What is the impact of TPACK-ETP on EFL teachers' understanding and application of TPACK in Islamic boarding schools? This study also offers strategic solutions to address challenges such as limited access to technology and infrastructure and insufficient knowledge. Consequently, it is anticipated that this research serves as a valuable guide for EFL teachers in Islamic boarding schools in enhancing their TPACK competence, thereby strengthening their role in the digital age while preserving the Islamic identity that defines them.

METHOD

This study was qualitative research which aimed to investigate TPACK development of EFL teachers in Islamic boarding schools. This study was carried out for six months starting from July 2024 to December 2024, in two Islamic boarding schools situated in Lamongan, East Java, Indonesia. These Islamic boarding schools were selected through purposive sampling with two criteria: 1) there were at least some supporting facilities like computers or laptops, LCD projectors, and internet connectivity, and 2) the teachers were open and willing to teach with technology.

This study was conducted with four female EFL teachers, aged between 28 and 40, all of whom had over five years of teaching experience. Two of the participants (Participant A and Participant B) taught at the junior high school level, while the remaining two (Participant C and Participant D) were senior high school teachers. All participants graduated from an English education program, where they studied English content knowledge (CK) and pedagogy (PK). Additionally, they were proficient in using office software, operating laptops and LCD projectors, and utilizing the internet (TK). Therefore, it can be concluded that the participants possessed a foundational understanding of content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK). However, they were not familiar with online collaborative tools such as Google Workspace and had limited knowledge in creating digital learning media. All the participants were willing and signed written consent to be involved in this study.

In general, the implementation of TPACK-ETP was carried out in the light of the previous works of Tanak (2019) and Aktas and Özmen (2020); however, several modifications were made to suit the participants' needs and situations such as the instructional technologies delivered and the additional materials about how to utilize online collaborative tools.

TPACK-ETP was carried out for 12 weeks which consisted of three major phases: Training Phase (Understanding TPACK Framework & Tools), Lesson Plan Preparation Phase, and Teaching Practice Phase. The structure of TPACK-ETP is presented in Table 1.

Table 1. The Structure of TPACK-ETP

Week	Phase	Focus	Activities	Participant Outcomes
1	Training Phase (Understanding TPACK Framework & Tools)	Introduction to TPACK Framework	● Workshop on TPACK basics ● Group discussions ● - Case studies of effective TPACK in EFL	Understanding TPACK concepts and their relevance in EFL teaching.
2-4		Exploring EFL-Specific Technological Tools	● Introduction to instructional tools (Quizizz, Canva, and Plotagon) ● Using online collaborative tools (Google Workspace) ● Hands-on practice ● - Peer feedback on tool usability	Gaining familiarity with EFL teaching tools and their classroom applications.
5		Pedagogical Strategies for EFL	● Demonstration of strategies ● Brainstorming technology integration ● - Mapping pedagogy to technology	Understanding how to integrate pedagogy with technology for teaching EFL skills.
6	Lesson Plan Preparation	Designing TPACK-Aligned Lesson Plans	● Introducing lesson plan templates	Creating draft lesson plans that integrate TPACK for specific EFL skills.

Week	Phase	Focus	Activities	Participant Outcomes
			● Creating drafts focusing on specific skills ● - Group feedback on drafts	
7		Incorporating Technology into Lesson Plans	● Selecting suitable technologies ● Collaboratively creating tech-based activities ● - Refining lesson plans	Finalizing lesson plans with integrated, effective technologies for EFL teaching.
8		Developing Assessments Using TPACK	● Workshop on digital assessment tools ● Creating assessment rubrics ● - Peer evaluation of assessments	Developing digital and traditional assessments aligned with TPACK for EFL learners
9		Finalizing Lesson Plans	● Presenting lesson plans ● Giving feedback ● - Making final revisions	Finalizing polished TPACK-aligned lesson plans ready for classroom implementation.
10	Teaching Practice	Microteaching Sessions	● Conducting short teaching segments ● Giving peer/trainer feedback	Gaining experience in delivering TPACK-based lessons and receiving constructive feedback.

Week	Phase	Focus	Activities	Participant Outcomes
			● - Reflecting on challenges and solutions	
11		Real Classroom Implementation	● Implementing lesson plans in real/pilot settings ● - Documenting experiences in reflection journals	Applying TPACK in a real teaching environment and document teaching challenges and successes.
12		Reflective Practice	● Course Conclusion and Sharing Best Practices	Consolidating learning, sharing best practices, and planning for continued professional growth.

The Training Phase was designed to enhance the participants' understanding of the basic concepts of the TPACK framework and its effective application in the EFL classroom. This phase also provides opportunities for the participants to develop their skills in using various instructional tools, such as Canva, Quizizz, and Plotagon (an animation video creator). The selection of these tools was adaptable to meet the specific needs and characteristics of the participants' classrooms. For instance, PHET (*https://phet.colorado.edu/tr/)* was introduced in Aktas and Özmen (2020) because the participants were science student teachers, WebQuest was used in Tanak (2019), and GeoGebra was included in Durdu and Dag (2017). In the second phase, which focused on lesson plan preparation, the participants had the chance to create TPACK-based lesson plans that incorporated appropriate technologies for the classroom, along with the development of corresponding assessments. The final phase, Teaching Practice, included two main components: peer teaching and real classroom implementation, allowing the participants to apply their learning in a practical teaching context. Even though the participants were in-service teachers, peer teaching or microteaching before having real classroom was held to obtain constructive suggestions from peers. This point is in line with what has been carried out by Aktas and Özmen (2020) and Cahyono et al., (2016).

This study collected data from multiple sources, including classroom observations, interviews (one-on-one and group), documents (lesson plans), and audiovisual materials (teaching recordings). The use of multiple data sources, rather than a single one, is a hallmark of qualitative research (Creswell & Creswell, 2023) lending itself to potentially higher degree of trustworthiness. Classroom observations were conducted twice for each participant, with us

serving as non-participant observers. As non-participant observers, we focused on observing the participants without directly engaging in the activities (Creswell & Poth, 2018). The first observation took place before the TPACK-ETP was implemented, and the second occurred after its completion. To gather data during these observations, we took detailed field notes and used a TPACK checklist. The teaching and learning processes were also recorded for ease in analyzing the data. In addition to the observations, interviews were conducted multiple times, both before and after the implementation of TPACK-ETP. These interviews aimed to gather insights and clarify the participants' actions in their teaching practices. Furthermore, focus group interviews were held to explore the participants' challenges and expectations regarding the implementation of TPACK in their schools. To analyze the data and address the research questions, we followed a systematic analytic process, which included the following steps: organizing and preparing the data for analysis, reading through all the data, coding the data, identifying themes, and finally, presenting and interpreting the data (Creswell & Creswell, 2023).

FINDINGS AND DISCUSSION

Findings

The impact of the TPACK-ETP on EFL teachers' application of TPACK in the Islamic boarding school setting is evident in their teaching practices, as indicated by the data from field notes, checklists, and video recordings. Moreover, supporting data from the interviews is used to complement the data interpretation. The findings are presented based on the following headings 1) TPACK implementation in pesantren: transformation in practice, and 2) overcoming barriers: resource constraints and professional development.

TPACK Implementation in Pesantren: Transformation in Practice

Creative use of technology

One of the most notable outcomes of the TPACK-ETP intervention was the marked improvement in the teachers' technological knowledge and their ability to integrate technology into their teaching. After the implementation of the program, all teachers showed improved TPACK integration in their teaching despite various barriers they encountered. The transformation for each teacher is distinctive and in accordance with their respective pace. Overall, the teachers moved beyond traditional methods to apply technology thoughtfully, combining technological, pedagogical, and content knowledge.

Teacher A and Teacher B, who previously struggled in technology resources, began to incorporate TPACK although in a modest way. Both teachers initially depended on traditional teaching methods such as worksheets or lectures, showcasing limited technological knowledge (TK) despite strong content and pedagogical knowledge, but then they demonstrated significant improvements in their teaching after adopting the TPACK framework, integrating technology into their lessons in more meaningful and student-centered ways.

In the second classroom observations, Teacher A effectively used Canva to present contents and visuals, which significantly enhanced student engagement (classroom

observation, 12/15/2024). Teacher A integrated quizzes created with Canva into the lesson, adding an interactive element to motivate students in completing the quiz. She also reflected on how the platform's diverse features could help her create more meaningful and engaging classroom experiences.

> "At first, I thought using Canva was complicated, but I was wrong. It's been great for creating fun and engaging classroom experiences with different features. The students were also enthusiast and motivated because they could see various food illustrations rather than the texts only."

Likewise, Teacher B also preferred using Canva for its ease of use and efficiency. In their classroom, students became more engaged, as the lessons included not only explanations but also pictures and short videos (classroom observation, 12/17/2024).

> "For the hobbies and interests lesson, I used Canva because it is easy to use. I don't need special skills to operate it. I found tons of cool illustration elements to work with. I even designed and customized my own student worksheets. Plus, I added short videos to my presentation to make it more engaging."

While Teachers A and B began to integrate technology in their classroom, Teachers C and D had already taken a step further because they did not experience technical issues like sharing LCD projectors. Both participants initially relied on basic technological tools, such as PowerPoint and Quizizz for Participant C, and PowerPoint and YouTube for Participant D. it needs noting that their early usage was more teacher-centered and focused on content delivery rather than student engagement. Following the TPACK-ETP implementation, both participants began integrating more creative and innovative tools into their lessons, Quizizz's Paper Mode for Participant C, and Canva and Plotagon for Participant D, resulting in greater student participation.

> "I learned it from one of the speakers in the course who showed how to use Quizizz in paper mode. It was super relatable since she also teaches in a *pesantren* and has been through similar stuff. Using Quizizz paper mode makes learning way more fun for students, even without gadgets or internet." (Teacher C, interview 12/19/2024)

On the other hand, Teacher D who initially struggled with lesson planning due to over-reliance on Microsoft PowerPoint and YouTube, started using more creative tools like Canva for presentations and Plotagon for animations. In the second observation, Teacher D implemented project-based learning by having students create their own Plotagon videos (classroom observation, 12/21/2024). As Plotagon requires an online connection, she directed the students to use the computer lab, where internet access was available. This shift made her teaching more interactive, with better use of technology to engage students and improve learning.

> "I never really thought about using project-based learning, especially for online projects. During the course, I had lots of discussions with the instructor and we shared ideas on what could be done. That's when I came up with the idea of assigning a task to create animation videos using Plotagon. But since the students didn't have personal devices, we worked on it in the computer lab instead." (Teacher D, interview 12/21/2024)

Overall, the TPACK-ETP intervention not only improved technological knowledge but also inspired the participants to explore creative and innovative methods for teaching, resulting in a more engaging and effective learning environment for their students.

Boost in Confidence

In addition to the improvement in integrating technology, all teachers also gained their confidence after TPACK-EPT was implemented. In this case, Teacher B felt more confident in utilizing technology for her teaching, while Teacher A also felt her confidence in using Canva improved.

> "After joining the course, I feel way more confident using Canva and another apps for teaching. I also take this chance (attending the course) to discuss with my colleague about any other potential applications or websites to use in the classroom". (Teacher B, interview 12/20/2024)

> "I feel like my confidence in using Canva has really improved after joining the TPACK-EPT. Everyone here is supportive and full of ideas, which made me feel comfortable asking questions." (Teacher A, 12/17/2024)

Another teacher also gained confidence in using technology and started exploring new methods and tools.

> "Now, I use other applications besides Microsoft PowerPoint and YouTube. Because of the course, I know how to create interactive presentations using Canva replacing the PowerPoint I used to use. Once I know how to make Plotagon animated videos, I also try it. Since I understand how these tools work, I am confident in utilizing them in my classroom." (Teacher D, interview 12/20/2024)

Overcoming Barriers: Resource Constraints and Professional Development

Barriers in Technology Integration

Before successfully integrating technology and TPACK into their classrooms, teachers had to overcome various personal barriers and challenges. Prior to the program, two teachers (Teacher A and Teacher B) did not use any technology in their classrooms and relied solely on student worksheets, but they exhibited strong content knowledge and pedagogical knowledge simultaneously. Meanwhile, the others (Teacher C and Teacher D) had a foundational understanding of technology use but were restricted to a narrow range of tools as Microsoft PowerPoint and YouTube, limiting their potentials to engage students more dynamically.

In the interviews, Teachers A and B, who were junior high school teachers, expressed their barriers in using technology because of limited access to LCD projectors. Observations revealed that LCD projectors were not installed in every classroom, prompting the school to provide portable units as a solution. However, due to their limited quantity, teachers had to share them and use them in turns.

> "Using technology in the classroom takes a lot of effort since the LCD projectors are portable and have to be shared. It's not always easy to get access when I need it. There was this one time I had everything ready for a presentation, thinking I'd use the LCD projector, but turns out another teacher had already borrowed it. It was pretty frustrating, especially after putting in all that effort to

> prepare. Sharing tech like this at school can definitely be a struggle." (Teacher A, interview 7/10/2024)

Teacher B expressed a preference for traditional, time-efficient methods and had little engagement with digital tools. She also complained about sharing LCD projectors with other teachers and had a difficulty in setting up the tools herself. Similar to Teacher A, Teacher B's lesson relied exclusively on lecturing and student worksheets, but still excelled at managing the classroom (classroom observation, 7/12/2024).

> "I prefer teaching the traditional way since not all classrooms have LCD projectors, and we have to share them. On top of that, we have to set up the projector ourselves, which can take quite a bit of time. Sometimes there are issues with the cables and other things, and it usually spends around 10-15 minutes. It's just easier to stick to simpler methods". (Teacher B, interview 7/12/2024)

On the other hand, Teacher C and Teacher D who had a basic understanding of technology identified lack of creativity and innovation in their teaching methods. Teacher C used Microsoft PowerPoint slides to provide a general overview of the material and made use of Quizizz to facilitate problem-solving activities (classroom observation, 7/12/2024). Due to the prohibition of bringing mobile phones into the *pesantren* area, as per school regulations, students without personal devices collaborated with their classmates to answer the questions.

> "I've been trying to integrate technology into my English lessons. Since I used to be a *pesantren* student, I know what it's like to struggle with motivation to learn. That's why I enjoy using apps to make learning fun for my students. For example, I use Quizizz for applying game-based learning. It would be great if the students play it (Quizizz) using their own mobile phones, but here (at *Pesantren*) they are not allowed to do so (Teacher C, interview 7/12/2024)

Teacher D demonstrated adequate technological knowledge by utilizing a laptop, LCD projector, sound system, and Microsoft PowerPoint to deliver her lessons. Overall, her teaching primarily involved Microsoft PowerPoint slides and YouTube videos, which may have appeared monotonous to students since she used them regularly. The classroom environment reflected a less creative and engaging approach, as she relied on teacher-centered methods rather than fostering student-centered learning (classroom observation, 7/15/2024). While Teacher C expressed her barrier in the absence of students' device, Teacher D admitted her lack of creativity for minimum exposure to professional training.

> "What I do to integrate technology is use PPT presentations and videos I download from YouTube. Honestly, I feel like I'm not very creative since I just rely on those two things, but it is what it is. Plus, I rarely join training sessions, so I don't get many new ideas. At first, I thought it would attract the students, but since I used it all the time, maybe they feel a bit bored." (Teacher D, 7/15/2024)

To sum up, there were two types of barriers experienced by the EFL teachers: limited access to technology resources particularly LCD projectors and a lack of creativity and innovation in utilizing technology effectively in the teaching. Limited access to technology made it difficult for teachers incorporate technology into their teaching, leaving them reliant on

traditional methods like lecturing and student worksheets, while a lack of creativity resulted in less engaging, teacher-centered learning experiences.

Overcoming Technology Barriers

At the beginning of the course, all the teachers worked together to address their challenges, engaging in discussions to identify the most effective solutions. First, to tackle the issue of LCD projectors, they decided to implement a booking system as initiated by Teacher A because those who experienced problems regarding LCD projectors were the junior high school teachers.

> "To make sure I had the LCD projector for my class, I booked it a week ahead of time, and that made it super easy to pull off my presentation with Canva." (Teacher A, interview 12/20/2024)

As for future use, they decided to have a scheduling system to ensure that each teacher has access to the projectors when needed.

> "I'm really glad we had the chance to sit down together and sort things out, especially when it comes to using the LCD. With the new scheduling system in place, I can better plan ahead and know exactly when I'll be able to use apps like Canva or Quizizz during my lessons. Looking ahead to next semester, I feel confident that I can start mapping out the topics that require the LCD and include them in my semester lesson plans." (Teacher B, interview 12/20/2024)

Additionally, the teachers requested the school to conduct regular maintenance checks on the cables and other projectors' components, ensuring they remain in a good condition and are ready to use without any problems. Besides, the issues of students not having personal devices was also addressed. Through the course, Teacher C figured out that Quizizz could be utilized in paper mode, which provided a lot of benefits for students' engagement. For project-based learning, Teacher D guided her students to use computer lab to work on their Plotagon animation videos.

Building Professional Development

The findings also reveal that the TPACK-ETP intervention served as a transformative experience for all teachers, equipping them with enhanced technological knowledge and the confidence to integrate technology creatively in their classrooms. The teachers leveraged the TPACK-ETP framework not just for personal skill-building but also to exchange ideas with colleagues and instructors. TPACK-ETP serves as an excellent platform for teachers to connect, exchange ideas, and collaborate in creating innovative teaching.

Observations during the discussion sessions revealed that it was Teacher C, as the youngest teacher, who frequently shared information related to the latest applications or websites useful for interactive teaching.

> "In my free time, I usually watch TikTok or Instagram reels, where I learn new things about using technology in teaching. I also follow some YouTube channels. Even though the methods are generally designed for regular classes with students who bring their phones, they still give me some useful ideas."

In this case, Teacher B expressed her gratefulness for the substantial benefits she gained from attending the course.

> "I've started discussing potential apps or websites with other teachers, especially Teacher C. She's always helpful and either shares a link or explains things directly. It's been really beneficial for me."

Additionally, Teacher C gained insights into Quizizz's Paper Mode from a speaker at the course and actively sought inspiration from peers online, showcasing how professional development fosters shared learning and community-building.

Discussion

The findings indicate that all the participants showed improved TPACK integration in their teaching. In this case, TPACK-EPT has an essential role in building teachers' confidence in technology use and fostering their creativity and innovation by encouraging collaboration and idea-sharing. Bwalya et al. (2024) confirm that a significant contributor to TPACK improvement was the joint effort in creating lesson plans and engaging in peer discussions about utilizing technology and teaching strategies. Moreover, in terms of peer teaching practice, Kafyulilo et al., (2015) assert that offering teachers with the opportunities to deliver lessons that incorporate technology is essential for building their confidence. Moreover, teachers' confidence in implementing TPACK is closely tied to the positive feedback they received from their peers. Such feedback enhances their sense of competent, fostering intrinsic motivation to innovate in their teaching practices (Aritonang, 2014). Through the course, teachers receive knowledge and direct support from the instructors, experts, and peers, which eventually help them in achieving consistency of teaching with TPACK framework.

Furthermore, the findings also confirm that technological domains (TK, TCK, and TPACK) are perceived to gain significant improvement, while domains of content knowledge (CK), pedagogical knowledge (PK), and pedagogical content knowledge (PCK) did not demonstrate significant growth. This result is similar to the previous research indicating that, although teachers rated their CK and PCK highly before the implementation of the TPACK course, they lacked the necessary knowledge and skills to teach effectively with technology (Bwalya et al., 2024; Durdu & Dag, 2017). The plausible reason can be related to the situation where the teachers were struggling with a school environment with limited access to technology (Wajdi et al., 2024). Their habit of teaching without technology has also led them to constantly find ways to manage the classroom and keep it enjoyable for the students. Besides, all the participants were experienced teachers with more than 5 years of teaching experience, in which the past research indicated positive relationship between teaching experience and perceived CK, PK, and PCK (Nazari et al., 2019).

Another important finding indicates that TPACK-ETP can be a valuable forum for teachers to address and overcome barriers as well as supporting lifelong professional development. As noted earlier, in this research, two types of barriers as were identified: limited access to technology resources and a lack of creativity and innovation in utilizing technology

effectively in the teaching. The first type was particularly evident in Teachers A and B's experience, where they expressed frustration over the shared availability of LCD projectors. However, this barrier also led to positive changes in how they approached technology use. Teacher A's proactive strategy of booking projectors in advance to ensure access to digital tools for her lessons demonstrated an increased level of agency in overcoming logistical constraints. Indeed, the availability of technology-based learning serves as a key measure of how effectively technology is integrated (Wajdi et al., 2024).

In addition, the role of professional development in overcoming the second type of barriers cannot be understated, as it was a key factor in participants' growing confidence and competence in using technology. Teacher C frequently shared her experience of exploring classroom innovations on social media platforms like Instagram and TikTok, and when she found useful information, she passed it along to her colleagues during the meeting. Moreover, TPACK-ETP connects educational experts and teachers to discuss the possible implementation of TPACK in a *pesantren* setting. In this regard, TPACK-ETP has essentially functioned as a teachers' professional development (TPD) program. An effective TPD program need to promote collaboration among colleagues, help teachers tackle teaching and learning challenges, and emphasize the key components of effective practice (Li, 2022). Also, TPD is seen as supportive when it can empower teachers to more likely experiment with new approaches (Setiawan & Kuswandono, 2020). In the future, TPACK-ETP can establish itself as lifelong professional development which motivates teachers to continually explore innovative ideas and tools.

CONCLUSION

The implementation of TPACK-ETP strongly enhanced EFL teachers' technological, pedagogical, and content knowledge, fostering a shift from traditional, teacher-centered practices to more dynamic, student-centered approaches. While barriers such as limited access to resources and a lack of creativity and innovation in utilizing technology posed challenges, the teachers' increased confidence in using digital tools and their proactive approach to overcoming obstacles were clear indicators of the course's success. Moving forward, Islamic boarding schools need to prioritize continued professional development in technology integration, ensuring that teachers not only gain the necessary skills but also the confidence to use them creatively in their classrooms. However, there are limitations to consider. The study did not provide longitudinal data to assess whether the observed changes in teaching practices were sustained over time. Future research could examine the long-term impact of TPACK-ETP on teaching effectiveness and student outcomes, as well as explore how ongoing professional development can support sustained technological integration.

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