

## **EFL Teachers' Technological Pedagogical Content Knowledge (TPACK) Competence at the Madrasah in Indonesia: A Post-Pandemic Analysis Study**

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### **Abstract**

This study discusses the Technological Pedagogical Content Knowledge (TPACK) competency of EFL teachers in Indonesian Madrasahs, especially in the post-pandemic period. Participants in this study were 10 English teachers in madrasahs from several provinces in Indonesia such as Banda Aceh, Bengkulu, Salatiga, Palangkaraya and Kendari. Data were collected from interviews, observation and field notes. It is hoped that the findings of this study will provide an overview of the current condition of EFL teachers in madrasahs and their actual competencies that have been analyzed through the TPACK framework. The results of this study are that the majority of EFL teachers in madrasahs who have low TPACK skills are in the majority at the Madrasah Ibtidaiyyah and Madrasah Tsanawiyah levels, while for the Madrasah Aliyah level, they are considered to have better TPACK knowledge. So that the results of this study can be new knowledge for academics in general and specifically who concentrate on ELF teachers at Islamic educational institutions in Indonesia and can be a consideration for policy makers in the field of education before they implement various specific rules related to the understanding of technology for teachers.

**Keywords:** *EFL Teachers, TPACK, Madrasah*

### **Introduction**

The contribution of Islam to the advancement of science and technology is essentially twofold. Muslims should own this paradigm, not the secular paradigm that exists now (Zuhdi, 2015). According to this Islamic paradigm, Islamic aqeedah must be employed as the foundation of thought (*Qa'idah Fikriyah*) for all science (Ilmi, 2012). This does not imply that Islamic Aqeedah becomes a source of all knowledge, but rather that it becomes a norm for all information. So, knowledge that

adheres to Islamic Aqeedah can be accepted and practiced, whilst knowledge that contradicts it must be rejected and cannot be practiced. Science and teaching abilities are both improving currently. The teacher should plan for the quick development of science. Teacher readiness in terms of science competence is appropriate to constantly be prepared to confront the problems of the times in today's global society. Teachers' abilities should also be strengthened in order to meet problems and increase educational quality (Nahar, 2022). Teacher competence in the twenty-first century necessitates continuous improvement. According to BSNP (*Badan Standar Nasional Pendidikan*), one of the most notable aspects of the twenty-first century is the increasingly interconnected world of science, which allows for faster synergy between them (Suprayitno & Wahyudi, 2020). As a result, the relationship between education and technology in the twenty-first century is critical and cannot be avoid. The use of the internet has now influenced all individuals inside the educational system. Individuals must be involved in technological progress and development, and they must be taught to do so. Now that learning environments are being enhanced with technology and changes in course content, classroom management, and applications are being made in response to these technologically enhanced arrangements, teachers must have the necessary knowledge and skills for integrating technology in education. Teachers now require a structure that allows for the integration of technology in their divisions and branches.

As technology continues to evolve, educators must adeptly utilize it to enhance learning. Teachers' improved technical proficiency in education will undoubtedly boost the process and consequences of learning. Consequently, a knowledge of technology interwoven into the learning process will surely enhance educational quality. Teachers must possess not just pedagogical and topic expertise but also technological proficiency to ensure that learning aligns with contemporary trends. Nonetheless, on a global level, educators' literacy and proficiency in integrating technology into their instruction remain suboptimal. The issues predominantly occur in developing nations (Sidi et al., 2023). For instance, 80% of educators in rural regions of African countries lacked proficient knowledge in utilizing technology to enhance their classroom operations. In Indonesia, educators in urban areas are better prepared than in previous decades, but rural instructors do not share this advancement due to severely restricted access to technology (Danu et al., 2023). The integration of technology, pedagogy, and content into the educational process provides educators with a novel viewpoint on enhancing both the process and learning outcomes. TPACK denotes the integration of technological knowledge, pedagogical knowledge, and content knowledge. TPACK is a framework that synthesizes technological knowledge, pedagogy, and content, offering a novel perspective on the integration of these three elements in education (Archambault &



Barnett, 2010). Integrating the three elements of technology, pedagogy, and content in education can generate diversity. The instructor is a vital element in the educational process. The instructor serves as the principal facilitator of the student learning process. Consequently, his presence and professionalism profoundly influence the execution of the national education agenda. Educators must consistently enhance their competencies (Darling-Hammond & Bransford, 2007; Shagrir, 2010). The application of technology and information serves to achieve competency development goals.

Technological tools, like the internet, can be employed to assist educators in enhancing their professional competencies. Given the accessibility of technology and knowledge, a teacher is anticipated to utilize these resources in the educational process, as well as serve as a catalyst for self-development. Consequently, this approach may present more challenges to students. Students have become accustomed to technical and informational improvements in their daily lives. Following the pre-observation results at several Madrasahs across three provinces in Indonesia, the researcher conducted interviews with the educators. It was disclosed that teachers had numerous challenges. Firstly, insufficient time exists for educators to participate in seminars and training focused on technology integration, which hinders their Technological Pedagogical Content Knowledge (TPACK) and exacerbates their limited comprehension of technology. Another issue is that some educators are not adequately comfortable with utilizing digital programs and resources, such as Zoom, Google Classroom, or Google Forms. Computers, laptops, and InFocus projectors are among the severely restricted instruments. The geographical location hinders internet access to online learning resources. The majority of English educators aged 40 and over encounter challenges in acquiring new technologies. Furthermore, despite multiple educators being dispatched to a seminar organized by the Ministry of Education and Culture (KEMENDIKBUD) or the Ministry of Religious Affairs (KEMENAG), the subsequent sharing session at the school was not fully optimized, occurring only during a limited number of sessions. Ultimately, the availability of computers and other supporting media in schools is severely restricted, leading teachers to routinely cancel classroom implementations.

While numerous researchers have examined pedagogical content knowledge globally and in Indonesia, research on technology pedagogical content knowledge remains limited. Extensive research on Technological Pedagogical Content Knowledge (TPACK) has consistently indicated that teachers' perceptions of TPACK are essential for effective preparation for 21st-century education (Masrifah et al., 2022; Irwanto et al., 2022; Lie & Tamah, 2023; Liando et al., 2023). Nevertheless, investigations of the technological pedagogical subject understanding of teachers in Madrasah have not been extensively conducted. Furthermore, preliminary research conducted through interviews with English teachers at

Madrasah in Indonesia revealed several challenges they encountered, including insufficient time to participate in seminars and training on technology integration to enhance their TPACK, as well as a scarcity of available tools, such as computers, laptops, and projectors. Additionally, the geographical location hindered internet access, limiting the use of online learning materials. This study aims to examine the Technological Pedagogical Content Knowledge (TPACK) of English teachers in Madrasah in Indonesia.

## Method

This research employed a descriptive qualitative methodology. The qualitative method is a descriptive research approach that typically employs analysis (Freeman, 1998). Qualitative research emphasizes process and meaning from the subject's perspective. Moleong (2005) asserts that qualitative research aims to comprehensively grasp the phenomena experienced by research respondents, including behavior, perceptions, motivations, and actions, through descriptive language and words. A specific context that is organic and employs diverse natural techniques. This study will employ qualitative research methodologies to investigate and comprehend a central phenomenon through interviews, observations, and field notes. Data is then gathered in the form of words or text. This compilation of data was analyzed by the researcher. The researcher subsequently articulated the analysis results in conjunction with findings from other pertinent investigations. The conclusive findings of qualitative research are presented in a written report. The objective of qualitative research is to elucidate a phenomenon comprehensively by gathering in-depth data, highlighting the significance of depth and detail regarding ELT teachers' TPACK ability in Madrasah in Indonesia (Lim, 2024). Based on the aforementioned definition, it can be inferred that qualitative research comprehends the phenomena experienced by the subject. Researchers employ triangulation to analyze results and elucidate the application of pedagogical technology content knowledge, as well as the challenges faced by English teachers in Madrasah in Indonesia. The subjects of the study were 2 madrasah teachers who each came from Banda Aceh, Bengkulu, Salatiga, Palangkaraya and Kendari, so that the total was 10 madrasah teachers from various levels, namely Madrasah Ibtidaiyyah or MI (Elementary School), Madrasah Tsanawiyah or MTs (Junior High School) and Madrasah Aliyah or MA (Senior High School). The codes for these teachers will later be called Teacher One (T1) to teacher ten (T10). Meanwhile, the teaching period that is the focus of this research is post-pandemic from 2023 to 2025.

## Results and Discussion

### Result



This section focuses on presenting teachers' experiences in utilizing reflective practices in their teaching, specifically to reflect on the use of technology within the TPACK framework. The findings are organized based on three focuses; implementation, obstacles and efforts.

### **1. The Implementation of TPACK by English Teachers at Madrasah in Indonesia**

English instructors in Madrasahs possess a fundamental understanding of technology, however they infrequently implement it in the classroom's teaching and learning processes. The results of interviews with T1, T3, T4, T7, T8, and T9 said that:

*Our comprehension of technology utilization in the classroom is minimal; we primarily employ it for administering questions or providing exercises through cellphones during online sessions. Meanwhile, we lack comprehension regarding the utilization of computer or laptop media in the classroom teaching and learning process.*

On the other hand, T2, T5, T6, and T8 stated different perspective:

*The integration of technology in the educational process facilitates our role as educators, enhancing material delivery and engaging students' interest in learning.*

The observational results indicate that T1, T3, T4, T7, T8, and T9 lack comprehension of technology's use in the teaching and learning process, but T2, T5, T6, and T8 demonstrate an understanding of its use. The observational findings are corroborated by field notes indicating that T1, T3, T4, T7, T8, and T9 only utilize textbooks, whereas T2, T5, T6, and T8 have incorporated various technological platforms in the classroom teaching and learning process.

Media is essential as a supportive element in the teaching and learning process. At the MI and MTs levels, English teachers predominantly utilize school textbooks as their primary media. The utilization of technology is exclusively conducted by T2, T5, T6, and T8, the majority of whom are English educators at the MA level. This is derived on interviews with English teachers at the MI and MTs levels, who indicated that:

*We primarily utilize school textbooks to instruct English content in class. We need students to download an electronic dictionary for each English topic to assist with challenging terminology. The material I utilize is exclusively derived from textbooks. Daily inquiries or assignments derived from textbooks.*

While the interviews conducted by researchers with English teachers who teach at the MA level are as follows:

*In addition to using school textbooks, we sometimes also create materials using Microsoft PowerPoint, Canva or also use several platforms on the internet such as Google Classroom to deliver materials or give assignments to our students.*

The interview findings indicate that most EFL teachers at the MI and MTs levels have not utilized technology in their instruction, such as laptops, computers, gadgets, or other media. In contrast, EFL teachers in MA classes demonstrate greater familiarity with the use of technology in their teaching, including laptops, computers, social media, and online digital platforms. The observations are elucidated by field notes indicating that T1, T3, T4, T7, T8, and T9 predominantly rely on textbooks for material delivery and assignments, but T2, T5, T6, and T8 have integrated technology and digital devices into the teaching and learning process.

The use of technology in the teaching and learning process can help teachers in delivering materials in class. The use of technology facilitates the teaching and learning process, but in this case, English as a second language (EFL) teachers in madrasahs have not fully implemented the use of technology in the form of software in the learning process. Based on interviews conducted to T1, T2, T3, T4, T7 and T8, he expressed his opinion on the use of technology in the teaching and learning process. which states that:

*We perceive the utilization of technology as a component of Technological Knowledge. We can still utilize hardware and software on computers; nevertheless, we did not engage in the production of materials employing technology.*

Meanwhile, regarding the use of technology for EFL teachers in madrasahs, T5, T6, and T9 stated that:

*The integration of technology in the educational process facilitates the delivery of instructional materials. While not employed in every lesson, we acknowledge that technology significantly enhances our teaching effectiveness and fosters student enthusiasm for learning English.*

The observations' results were further corroborated by field notes. According to the data, T1, T3, T4, T7, T8, and T9 did not utilize software for English learning, whereas T2, T5, T6, and T10 presented materials utilizing Infocus and software on a laptop. Interviews, observations, and field notes indicate that, generally, English teachers at the Madrasah Aliyah level possess a superior understanding of technology compared to their counterparts teaching at other levels within madrasahs. Nonetheless, it can be asserted that



English instructors at Madrasahs, in general, remain unable of consistently integrating technology into the teaching and learning process.

## 2. Obstacles to the Implementation of TPACK in Madrasah English Classes

Constraints are impediments encountered by English teachers in Madrasah when employing educational technology in the classroom, resulting in suboptimal learning implementation. The majority of English teachers in Madrasah, particularly those at the elementary and junior high school levels, do not utilize technology in the teaching and learning process due to a perceived lack of necessity to comprehend its application. Furthermore, according to field notes, T1, T3, T4, T7, T8, and T9 believe that their kids do not yet require technology-based tools for learning. Derived from interview data, observations, and field notes that have been conducted. It can be concluded that English teachers in MI and MTs encounter many problems as impediments related to the usage of technology in the classroom teaching and learning process. The issues encompass insufficient teacher comprehension in the application and integration of technology, inadequate school facilities for media-focused learning, the advanced age of educators, and a deficiency in student enthusiasm in learning English. This leads teachers to frequently depend only on school textbooks for explaining and delivering educational content. This is substantiated by interviews done with English educators. This is substantiated by interviews done with EFL instructors T1, T3, T4, T7, T8, and T9. This is articulated in the statement:

*The use of technology in the teaching and learning process makes it easier for teachers to deliver materials, but we still do not understand that its use will experience difficulties.*

While madrasah EFL teachers have different opinions regarding the difficulties in implementing TPACK in their classes, in this case T2, T5, T6, and T8, stated that:

*We understand the use of technology in teaching, although not not deep, but we regularly use some technology platforms to support the teaching and learning process as a necessity in working as educators. However, sometimes we are also still less responsive in the speed of improving teaching technology which often changes.*

In addition to the results of the interviews with EFL teachers above, based on the results of observations conducted, it is also known that T1, T3, T4, T7, T8 and T9 who mostly teach English at the MI and MTs levels have greater obstacles in implementing technology in the teaching and learning process. However, this is different from what was experienced by T2, T5, T6, and T8 who mostly teach English at the MA level and 1 teacher at the MI level who did not experience significant obstacles in implementing technology in

the teaching and learning process. This is also proven based on field notes, that EFL teachers at the MI and MTs levels mostly rarely apply technology in the teaching and learning process in class, but for EFL teachers who teach at the MA level and a small number at MI and MTs have applied technology in the teaching and learning process in their English classes.

The obstacles experienced in learning English in class come from students who are less interested in learning English, as well as students' focus which is sometimes still lacking and wants to play. However, for T2, T5, T6, and T8, they are quite good in overcoming these obstacles by implementing technology and an interesting teaching style. Based on the results of interviews conducted with English teachers, which stated that:

*The obstacles we experience in teaching are more about the students' interests. The lack of interest of students in learning English makes teachers have to actively equate learning, even though the curriculum requires students to be more active, but students still have to be given an understanding of the material from the teacher as a whole.*

Meanwhile, in this case, based on interviews with EFL teachers T1, T3, T4, T7, T8 and T9, it was stated that:

"Students in madrasahs are often less interested in learning English in class, so teachers have to use extra effort in teaching, so that sometimes we are less able to carry out teaching using technological devices because we do not have much time in class.

Sometimes in utilizing technology, teachers experience obstacles in its application or use. There are several factors of difficulty experienced by EFL teachers in madrasahs in utilizing technology in the classroom, such as age factors, lack of facilities in schools, and the rapid development of technology so that teachers need to learn how to utilize it. Based on interviews conducted with T1, T4, T7, T8 and T9, who stated that:

*The obstacles we experience are quite significant in the use of technology, because we do not understand the concept of the TPACK framework and understand only a few aspects of TPACK. Moreover, related to our age factor, we already find it difficult to learn technology and it is quite time consuming, so we often only provide material from school textbooks and in accordance with the lesson plan and syllabus.*

Meanwhile, the results of interviews with EFL teachers T2, T3, T5, T6, and T8 provide different experiences. They stated that:

*For now, we feel that we still have to learn more about the use of technology, because the rapid development of digital media requires us to be literate in using technology and also madrasah facilities that are often*





*less supportive, but in terms of understanding we try to always update and upgrade ourselves personally.*

The interview statement is corroborated by the field notes that were collected. T1, T4, T7, T8, and T9 did not utilize technology in the English teaching and learning process, whereas T2, T5, and T6 incorporated technology only twice. In contrast, T3 and T8 consistently integrated technology into nearly every English class session. The integration of technology in the educational process assists educators in delivering or aligning materials in the classroom. The utilization of technology facilitates teachers in delivering and elucidating lessons, while simultaneously enhancing students' enthusiasm in learning English through technological applications. Nevertheless, the insufficient comprehension of technology development and use among educators results in EFL teachers inadequately using technology in the teaching and learning process. In relation to this, based on interviews performed with all EFL instructors (T1 to T10):

*We believe that the integration of technology in the educational process is really beneficial. Teachers proficient in technology will undoubtedly find it easier to do their duties. Nonetheless, we believe it is essential to implement rigorous and continuous training on the application and utilization of learning technology for EFL teachers in madrasahs. Many EFL teachers in Madrasahs still lack comprehension regarding its application and utilization in the teaching and learning process.*

### **3. Efforts to Implement TPACK in Madrasah English Classes**

Efforts are a way to overcome problems or obstacles faced by someone, including the results of interviews, observation and field notes explained by English teachers based on efforts made in developing Learning Technology in madrasah that are the target of this study including: a) Understanding the pedagogical assumptions underlying the use of technology in learning, for example educational relevance, social impact, suitability to the classroom environment, cooperative learning, and peer interaction; b) Understanding learning technology and its potential to improve student learning outcomes; c) Increasing awareness of various adaptive applications and technologies to support student learning; d) Effective use of learning technology applications to support further learning; e) Improved skills in designing a series of Technology-based assessment tasks in learning that use clear assessment criteria related to lesson planning; f) Understanding the requirements that teachers and students use electronic information appropriately; g) Understanding the ability to use software to compose texts, create presentations, provide digital audio and visual series for classroom learning; h) Understanding of self-evaluation of English based on technology in learning and software for educational purposes.

In line with the efforts of English teachers in Madrasah Ibtidaiyyah and Madrasah Tsanawiyah that have been described above, there are other efforts in developing learning technology, including the minimal availability of educational technology media in the form of facilities and infrastructure in schools such as the number of computers and infocus (Hardware) and software to support the teaching and learning process. Regarding these difficulties, English teachers at the Madrasah Ibtidaiyyah and Madrasah Tsanawiyah levels explained that in implementing English learning, they often carry out simple learning without using educational technology media, such as learning modules. Based on the results of interviews, observations, and field notes, it is explained that in efforts to provide an understanding of TPACK, it is not necessary to blame the teachers alone. However, this is also closely related to the policies of the school institution (Madrasah), which can be formulated in the vision and mission and the madrasah's achievement strategy to develop the professional potential of its teachers, including English teachers. However, on the other hand, the results that researchers obtained from other madrasahs that were considered to be more concerned with improving the TPACK abilities of their English teachers, these institutions have carried out several methods as stimulus and support for their teachers, including the following:

1. Internal school development, as an initiative or regular activity conducted by school administrators and supervisors about teacher performance, ultimately aims to enhance teacher professionalism.
2. To enhance educational quality, a teacher must have a strategic role in all school activities by facilitating topic teacher discussions (MGMP).
3. Engaging educators in diverse training initiatives (seminars). This indicates that diverse training initiatives, seminars, and English subject teacher training are endeavors that the head of the Madrasah must do to enhance teacher professionalism using learning technology.
4. Aligning the vision and perception of English teachers regarding the implementation of current education (including awareness of the massive use of digital technology platforms) in order to continue to improve their competence as teaching professions.

## Discussions

The findings of this study indicate a necessity for enhanced comprehension of TPACK components and the utilization of technology by English educators in Madrasah. If the educator fails to comprehend and implement technology in the teaching and learning process, students may lose interest in learning English, as a monotonous approach relying solely on textbooks is insufficient for effective



learning. Unexpected findings from interviews, checklist observations, and field notes revealed a deficiency in English instructors' comprehension of technology utilization in the implementation of the teaching and learning process inside the classroom. This study revealed that although the English instructors at Madrasah comprehended the use of technology, they did not completely implement or apply it in the teaching and learning process. This study posits that the utilization of technology and comprehension of TPACK components should be familiar to Madrasah English educators. To navigate the contemporary digital environment, educators must comprehend technology and its use in the classroom's teaching and learning processes. Consequently, English educators are anticipated to comprehend and effectively utilize technology in instruction.

The comprehension of English educators in Madrasah about technology and the components of TPACK in the contemporary digital age is essential. In the educational process, the instructor should leverage technology in its implementation. Using technology is highly beneficial for educators' pedagogical abilities and enhances the teaching and learning experience for students, facilitating their comprehension of the English language. Research on the TPACK framework for English instructors reveals both parallels and variations when compared to other studies. This research is distinguished from prior studies by its focus on English teachers' comprehension and utilization of technology in the classroom, as well as the challenges they encounter in implementing technology within the teaching and learning process.

Based on theory, TPACK is a relatively new skill that must be mastered by teachers in order to integrate technology well into the learning process (Kohler et al, 2013). This means that teachers must master the use of technology for teaching and learning purposes. That a teacher must be able to utilize existing technology to create learning media so that they can carry out an enjoyable online learning process for students. This is because the media can increase enthusiasm and enthusiasm and minimize student boredom, and can facilitate teachers in the process of delivering material to students, especially in English learning which focuses on developing foreign language skills and is related to students' cognitive abilities. This statement is also supported by research from Tseng et al., (2022) and Larasati & Widyasari, (2021) which states that the ability to utilize and develop media, especially technology-based media, is found in TPACK. Such research has given rise to a wealth of literature discussing various definitions and interpretations of TPACK (e.g. Voogt et al., 2017, Petko et al, 2025) as well as frameworks for integrating technology into teaching (Koehler & Mishra, 2016). Similarities found in previous studies that also discussed teachers' understanding of technology use and aspects of TPACK were taken from the same studies by Nilsson (2024), Visona & Kurt (2024) and Ma et al (2024).



In this study, the results were obtained in the form of a low understanding of Madrasah English teachers in the TPACK aspect of the use of technology in teaching and learning. This is a reflection or picture of the learning process for teachers to be able to learn to understand the use of technology because in the current digital era teachers should make the teaching and learning process interesting for students. And the need for an understanding of the use of technology is also important for a teacher because the teacher aims to educate the students of course the teacher must have a broad understanding of the TPACK aspect in the use of technology. This is also supported by the Ministry of Religion of the Republic of Indonesia to improve understanding and use of digital platforms in all Madrasah in Indonesia at this era (Kusuma & Widyarsa, 2025). The results of the study indicate that if a teacher understands or does not use technology but does not apply it in the teaching and learning process, it will make the teaching and learning process the same as before, and there will be no changes or new breakthroughs by the teacher to advance the teaching and learning system. Of course, if the teacher understands how the use of technology and aspects of TPACK in the teaching and learning process will make changes and have a good impact on students. Students will be more interested in the way the teacher equates the material with technology media.

## Conclusion

The outcomes of this study underscore the necessity for educators to comprehend the facets of TPACK in relation to technology utilization. In the contemporary digital age, all educators, particularly those teaching English, must leverage technology for instructional purposes. Consequently, they should receive enhanced training in technological applications, as educators can supplement traditional teaching with diverse resources, including online media. The study's findings indicate that implementation may occur by educating instructors on technology utilization. English educators in Madrasah can enhance their understanding of technology utilization to effectively integrate it into the teaching and learning process. Understanding the pedagogical principles that guide the integration of technology in education, such as educational relevance, social effect, suitability for the classroom context, collaborative learning, and peer interaction, is crucial. Understanding the role of technology in education and its potential to improve student learning outcomes is crucial. Enhance knowledge of adaptable apps and technology that facilitate student learning. The subsequent endeavor involves comprehending the efficacy of technology applications in education to enhance learning and refine abilities in creating a number of technology-based assessment activities. It is crucial to understand the importance of educators and learners using electronic information wisely. If teachers understand the TPACK framework and how to use technology



well, they can provide resources beyond just textbooks for teaching, especially in English language education, which is very interactive and helps students learn foreign languages better. Consequently, it is advisable for English educators at Madrasahs to optimize the usage of computers and projectors in the instructional process, as well as use internet connectivity to develop educational resources.

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