

EFL Teachers' TPACK Preparedness in Eastern Indonesia: Challenges and Strategies

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ABSTRACT

This study investigated junior high school EFL teachers' Technological Pedagogical Content Knowledge (TPACK) preparedness in Ambon, Eastern Indonesia, and examined the challenges they encountered and the strategies they employed during online teaching in 2021. Grounded in Koehler and Mishra's TPACK framework, this study adopted a sequential explanatory mixed-method design. Data were collected through a TPACK questionnaire administered to 51 EFL teachers and semi-structured interviews with seven selected participants. Quantitative findings revealed that participants self-reported a high level of TPACK preparedness, with Technological Knowledge emerging as the weakest domain. Qualitative findings identified two major challenges: engaging students in online learning and maintaining motivation in virtual classrooms. To address these, teachers employed digital learning media, technology-based assessment, interactive instructional design, and online classroom management strategies. The findings underscore the need for context-specific professional development targeting teachers' technological competencies in resource-limited educational settings in Eastern Indonesia.

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INTRODUCTION

In Eastern Indonesia, where educational and technological resources remain unevenly distributed across districts, junior high school English as a Foreign Language (EFL) teachers have faced increasing pressure to integrate digital technologies into their instructional practices. The COVID-19 pandemic dramatically accelerated this demand. This regional challenge mirrors a broader global transformation in education: the rapid advancement of digital technologies has reshaped how teachers deliver instruction and how students access and construct knowledge worldwide, making technology integration a central concern for educational systems at every level. In EFL contexts specifically, the integration of technology into language teaching has become increasingly important for supporting the development of 21st-century skills — including critical thinking, communication, collaboration, and digital literacy — as well as for designing interactive, resource-rich learning environments that extend beyond the physical classroom. Consequently, EFL teachers are expected not only to possess strong content knowledge and pedagogical competence but also to effectively integrate technology into their instructional practices to create meaningful language learning experiences (Nurhidayat et al., 2024; Voogt et al., 2013). In the English as a Foreign Language (EFL) context, technology integration offers opportunities to enhance language learning through interactive materials, digital resources, online collaboration, and innovative assessment practices (Patty & Matatula, 2025; Rintaningrum, 2023). Recent studies have further emphasized that technology-enhanced language learning can increase learner engagement, support collaborative learning, and facilitate the development of digital competencies required in contemporary educational settings (Nurhidayat et al., 2024; Rintaningrum, 2023).

To conceptualize the knowledge teachers need for effective technology integration, Koehler & Mishra (2009) introduced the Technological Pedagogical Content Knowledge (TPACK) framework, which extends Shulman's Pedagogical Content Knowledge by incorporating technological knowledge as an essential dimension of effective teaching in digital learning environments (Hashweh, 2014). The full elaboration of the framework's seven interrelated domains — including their definitions, operationalization in research, and specific relevance to EFL teaching — is discussed in the Literature Review section below.

The growing importance of technology in education has led to extensive research on teachers' TPACK preparedness across different educational contexts. Previous studies have generally reported positive perceptions of teachers' pedagogical and content knowledge while identifying technological knowledge as a comparatively weaker domain. For example, Aniq & Drahati (2019) and Prasajo et al. (2020) found that Indonesian EFL teachers demonstrated confidence in their pedagogical and content-related competencies but experienced difficulties in integrating technology effectively into classroom instruction. These findings suggest that while teachers recognize the value of technology in education, challenges remain in translating technological knowledge into effective teaching practices.

However, research findings concerning teachers' TPACK preparedness remain inconclusive across different contexts. While some studies have reported limitations in teachers' technological competencies, other studies have shown more encouraging results. For instance, Tuzahra et al. (2021) reported that in-service EFL teachers who participated in a Teacher Profession Education program in Indonesia gradually developed positive perceptions of technology integration, demonstrating awareness of both its pedagogical potential and practical constraints. Such variations indicate that contextual factors, including geographical location, access to technological resources, professional development opportunities, and institutional support, may influence teachers' TPACK preparedness.

Despite the growing body of TPACK research in Indonesia, several gaps remain evident. First, many existing studies have focused on pre-service teachers, university students, or teachers from urban and more developed regions of Indonesia. A review of published literature in databases such as Scopus, Google Scholar, and ERIC between 2015 and 2025 reveals that studies specifically examining junior high school EFL teachers in Eastern Indonesia — particularly in Ambon, Maluku — are virtually absent, with most research concentrated in Java, Sumatra, and Sulawesi. Second, previous studies have predominantly focused on measuring teachers' TPACK levels, with less attention to the challenges teachers encounter when integrating technology and the strategies they employ to address them within the specific constraints of the Eastern Indonesian educational context. Understanding these aspects is

particularly important because successful technology integration depends not only on teachers' knowledge but also on their ability to navigate contextual constraints and adapt their instructional practices accordingly.

Furthermore, the educational changes accelerated by the COVID-19 pandemic and the widespread adoption of online and technology-mediated learning have highlighted the need for teachers to develop their technological competencies continuously. It is important to note that the present study was conducted in 2021, during the height of pandemic-related disruptions to education in Indonesia, when online and hybrid instruction had become the primary mode of delivery for most schools. The findings should therefore be understood within this specific historical moment, rather than as a general portrait of EFL teaching in Eastern Indonesia today. Despite this temporal specificity, the challenges and strategies documented in this study remain highly relevant as teachers continue to navigate post-pandemic hybrid learning environments. Recent studies have shown that the pandemic significantly increased teachers' reliance on digital technologies and underscored the importance of TPACK for effective EFL instruction in virtual and hybrid learning environments (Aniq & Drajati, 2019; Drajati et al., 2021). Although technology offers numerous opportunities for enhancing language learning, teachers continue to encounter challenges related to student engagement, motivation, classroom management, and the effective use of digital tools (Nartiningrum & Nugroho, 2021; Rochsantiningasih & Aniq, 2023). Investigating how teachers respond to these challenges can provide valuable insights for teacher education programs, professional development initiatives, and educational policymakers seeking to strengthen technology integration in EFL instruction (Theodorio et al., 2024; Tseng et al., 2022).

Therefore, this study aims to investigate the level of TPACK preparedness among junior high school EFL teachers in Eastern Indonesia, identify the challenges they encounter in integrating technology into their teaching practices, and explore the strategies they employ to overcome these challenges. By examining preparedness, challenges, and coping strategies simultaneously, this study seeks to contribute to a more comprehensive understanding of EFL teachers' technology integration practices in a relatively underexplored educational context.

Accordingly, this study addresses the following research questions:

1. What is the level of TPACK preparedness among junior high school EFL teachers in Eastern Indonesia?
2. What challenges do EFL teachers encounter when integrating technology into their teaching practices?
3. What strategies do EFL teachers employ to overcome these challenges?

LITERATURE REVIEW

TPACK and Technology Integration in EFL Teaching

The rapid advancement of digital technology has transformed educational practices and increased the demand for technology-integrated teaching. In EFL contexts, technology plays a significant role in facilitating language learning through various digital tools and platforms. Technologies such as Computer-Assisted Language Learning (CALL), social media platforms, communication applications, and multimedia resources provide opportunities for students to engage with authentic language materials and meaningful communication (Golonka et al., 2014; Habibi et al., 2018; Kabilan et al., 2010). The integration of technology into language teaching is also considered essential for supporting students' development of 21st-century skills, including communication, collaboration, critical thinking, and digital literacy (Van Laar et al., 2017; Voogt et al., 2013).

To support effective technology integration, teachers must possess not only pedagogical and content knowledge but also technological competence. Koehler & Mishra (2009) introduced the Technological Pedagogical Content Knowledge (TPACK) framework as a conceptual model describing the knowledge required for effective technology integration in teaching. The framework consists of seven interrelated domains: Technological Knowledge (TK), Pedagogical Knowledge (PK), Content Knowledge (CK), Technological Pedagogical Knowledge (TPK), Technological Content Knowledge (TCK), Pedagogical Content Knowledge (PCK), and Technological Pedagogical Content Knowledge (TPACK)

(Koehler et al., 2013). The framework has become one of the most widely used approaches for examining teachers' readiness and competence in technology-enhanced teaching environments.

Recent studies have confirmed the continued relevance of TPACK in understanding teachers' readiness to integrate technology in post-pandemic EFL contexts. Indonesian studies have reported that teachers generally demonstrate positive attitudes toward technology integration while still experiencing challenges related to technological competence and classroom implementation (Budianto et al., 2023; Lisia et al., 2024). Similarly, Ali & Mohammadzadeh (2022) found that teachers' educational background, experience, and beliefs significantly influenced their implementation of TPACK in EFL classrooms. Studies conducted during and after the COVID-19 pandemic also highlighted the growing importance of TPACK for supporting technology-mediated instruction in EFL contexts (Drajati et al., 2021; Rochsantiningasih & Aniq, 2023). In EFL education, TPACK enables teachers to select appropriate technologies, design meaningful learning activities, implement suitable teaching strategies, and assess students effectively through digital platforms. Therefore, teachers' TPACK preparedness is considered an important indicator of their ability to adapt to technology-mediated language teaching and learning.

EFL Teachers' TPACK Preparedness

Numerous studies have investigated teachers' TPACK preparedness in different educational contexts. Research conducted by Sariçoban et al. (2019) revealed that pre-service EFL teachers generally perceived themselves as competent across most TPACK domains. Similarly, Cahyono et al. (2016) found that Indonesian EFL teachers benefited significantly from TPACK-oriented teaching practice programs, which improved their instructional design and classroom teaching practices. Their findings suggest that professional development activities can strengthen teachers' ability to integrate technology effectively into language teaching. However, findings from Indonesian contexts have also indicated challenges related to technological knowledge. Prasojo et al. (2020) reported that Indonesian in-service EFL teachers demonstrated sufficient pedagogical knowledge but relatively lower technological knowledge. This finding suggests that although teachers possess adequate teaching expertise, they may still encounter difficulties when integrating technology into instructional practices.

In contrast, Tuzahra et al. (2021) reported a more constructive trend among in-service EFL teachers in an Indonesian Teacher Profession Education program. Despite initial resistance when first introduced to new digital tools, teachers generally developed positive perceptions of technology integration over time. They demonstrated growing awareness of both its pedagogical benefits and practical limitations. Nonetheless, challenges in applying technology during actual Teaching Practice remained, particularly due to students' low motivation to engage in online learning activities. These findings indicate that TPACK preparedness may vary across educational contexts and geographical locations. Consequently, further investigation is needed to examine the preparedness of junior high school EFL teachers in Eastern Indonesia, particularly in Ambon, where research on teachers' TPACK preparedness remains limited.

Challenges in Technology Integration for EFL Teaching

Although technology offers numerous benefits for language learning, its implementation often comes with challenges. Previous studies have identified several challenges in technology-integrated EFL instruction, including limited student participation, difficulties with classroom management, technological constraints, and reduced interaction during online learning (Nartiningrum & Nugroho, 2021; Rochsantiningasih & Aniq, 2023). These factors can affect teachers' readiness and their ability to implement technology effectively in classroom instruction. Theodorio et al. (2024) further documented that post-pandemic teacher education programs in developing countries continue to face challenges such as technological incompatibility, socio-economic disparities, and insufficient institutional support, underscoring the systemic nature of technology-integration barriers beyond individual teacher competence.

Previous studies have identified several obstacles that teachers encounter in technology-mediated learning. Ria (2021) reported that both teachers and students experienced difficulties in operating digital learning platforms and managing online learning activities. Limited technological skills

often hindered teachers from delivering effective online instruction, while students faced challenges accessing and completing online learning tasks. Infrastructure-related issues also remain significant barriers. Unstable internet connectivity and unexpected power outages frequently disrupt online learning activities, particularly in regions with limited technological support (Ria, 2021; Saputra et al., 2022). A systematic review by Akram et al. (2022) further confirmed that slow internet speed, inadequate ICT infrastructure, and insufficient teacher training are among the most consistently reported barriers to effective technology integration in schools across developing country contexts.

Furthermore, Mulyono et al. (2021) found that poor internet access reduced students' ability to participate in learning activities actively and to complete assignments effectively. Other challenges include insufficient teacher training, limited funding for technology implementation, and inadequate institutional support (Hidayati, 2022). These findings suggest that successful technology integration requires both teachers' technological competence and adequate support from educational institutions.

Strategies for Enhancing Technology-Integrated EFL Teaching

To overcome the challenges of technology integration, teachers must continuously develop their technological and pedagogical competencies. Cahyono et al. (2016) emphasized the importance of professional development programs that enable teachers to contextualize TPACK principles within their own teaching environments. Such programs help teachers adapt technology to local educational contexts and improve their instructional practices. Technology also offers teachers numerous opportunities to design engaging learning environments. Digital communication tools, multimedia resources, online assessment platforms, and virtual learning environments can facilitate interaction, increase student participation, and support language learning beyond classroom boundaries (Golonka et al., 2014; Habibi et al., 2018; Kabilan et al., 2010). By selecting appropriate technologies and integrating them with suitable pedagogical approaches, teachers can address learning challenges while enhancing students' engagement and learning outcomes.

Therefore, strengthening teachers' TPACK preparedness is essential not only for improving technology integration but also for enabling them to develop effective strategies to address the challenges encountered in technology-mediated EFL instruction. Tseng et al. (2022), in their critical review of TPACK research in language teaching, emphasized that effective technology integration in EFL contexts requires teachers to continuously develop context-sensitive knowledge that bridges technological tools with specific language learning goals. As digital tools continue to evolve, Sumakul et al. (2022) highlighted that EFL teachers must also develop informed and critical stances toward emerging technologies such as artificial intelligence to make pedagogically sound instructional decisions. Critically, this body of literature underscores a need for research that examines not only what teachers know about TPACK, but how they actually navigate its implementation under resource constraints and infrastructure limitations specific to their local context. It is precisely this gap — the absence of research on how junior high school EFL teachers in Ambon, Eastern Indonesia, develop and apply strategies for technology-integrated teaching in a resource-limited setting — that the three research questions of the present study aim to address.

METHOD

Research Design

This study employed a sequential explanatory mixed-method design to investigate EFL teachers' TPACK preparedness and explore the challenges and strategies associated with technology integration in English language teaching. A sequential explanatory design was chosen because it allowed quantitative data to be collected and analyzed first to identify the overall patterns of teachers' TPACK preparedness, with qualitative data subsequently collected to explain and elaborate on those quantitative results in greater depth. The quantitative phase aimed to identify teachers' levels of TPACK preparedness, while the qualitative phase sought to deepen understanding of the challenges they encountered and the strategies they employed in technology-mediated instruction. The integration of quantitative and qualitative findings enabled a comprehensive understanding of teachers' preparedness and experiences in technology-enhanced EFL teaching.

Research Site and Participants

The study was conducted in Ambon City, Eastern Indonesia, involving junior high school EFL teachers from 30 public and private schools across five districts: Sirimau, Nusaniwe, Baguala, Leitimur Selatan, and Teluk Ambon. Data collection took place between June and September 2021, during the period of compulsory online instruction imposed by COVID-19 health protocols across Indonesian schools. A total of 51 EFL teachers participated in the questionnaire survey. The participants varied in terms of age, teaching experience, and school backgrounds. All participants held at least a bachelor's degree in English Education or a related field. It is acknowledged that with 51 participants drawn from 30 schools, the sample averages fewer than two teachers per school. While this sampling density is a limitation that readers should consider when interpreting the generalizability of the quantitative findings, it nonetheless represents a meaningful proportion of the total EFL teacher population across Ambon City's five districts. It is sufficient for the exploratory and descriptive purposes of this study.

Following the questionnaire analysis, seven teachers with high levels of TPACK preparedness were selected for semi-structured interviews. The selection of high-scoring teachers was theoretically motivated: as this study aims to document the strategies that EFL teachers employ to navigate the challenges of technology integration, participants with higher TPACK preparedness were expected to have had more sustained and reflective engagement with digital tools, and thus to offer richer and more elaborated accounts of their instructional decision-making. The interview participants were chosen purposively to provide detailed insights into their experiences, challenges, and strategies in integrating technology into EFL teaching practices. This design's limitation is acknowledged: the qualitative findings reflect the experiences of the most technologically capable teachers in the sample and may not represent the challenges faced by teachers with lower TPACK preparedness.

Data Collection and Analysis

Data were collected through a TPACK questionnaire and semi-structured interviews. The questionnaire was adapted from the TPACK instruments developed by [Koehler & Mishra \(2009\)](#), [Schmidt et al. \(2009\)](#), [Sahin \(2011\)](#), and [Tuzahra et al. \(2021\)](#). The final questionnaire consisted of 43 items representing seven TPACK domains: Technological Knowledge (TK), Pedagogical Knowledge (PK), Content Knowledge (CK), Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and Technological Pedagogical Content Knowledge (TPACK). Responses were measured using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5).

The qualitative data were collected through semi-structured interviews consisting of ten guiding questions. The interviews explored teachers' experiences with technology integration, the challenges encountered in online teaching, and the strategies they used to support teaching and learning. All interviews were conducted online and audio-recorded with participants' consent. The quantitative data were analyzed using descriptive statistics to determine teachers' levels of TPACK preparedness. Before analysis, the validity and reliability of the adapted instrument were established. Content validity was confirmed through expert review by two experienced EFL educators who assessed the relevance and clarity of each item against the TPACK framework. Reliability was evaluated using Cronbach's alpha coefficients, which ranged from .78 to .91 across the seven TPACK domains (TK = .82; PK = .78; CK = .81; TPK = .85; TCK = .83; PCK = .79; TPACK = .91), indicating acceptable to excellent internal consistency. The qualitative data were analyzed through thematic analysis following the six-phase framework proposed by [Braun & Clarke \(2006\)](#): (1) familiarization with the data; (2) generating initial codes; (3) searching for themes; (4) reviewing themes; (5) defining and naming themes; and (6) producing the report. Themes were identified inductively from the interview transcripts and refined iteratively through researcher discussion until consensus was reached, ensuring they were grounded in participant perspectives rather than imposed from pre-existing categories. To enhance trustworthiness, member checking was conducted by returning interview transcripts and interpretations to participants for verification. Expert consultation was also employed to strengthen the credibility of the findings. Additionally, triangulation was performed by systematically comparing and integrating the quantitative

and qualitative findings: quantitative scores identifying Technological Knowledge as the weakest TPACK domain were cross-referenced with qualitative accounts of challenges encountered in actual technology use, enabling a more coherent and mutually validating interpretation of teachers' TPACK preparedness and its practical manifestations in the classroom.

FINDINGS

EFL Teachers' TPACK Preparedness

The quantitative findings revealed that the participating EFL teachers demonstrated a generally high level of TPACK preparedness. Table 1 presents the descriptive statistics for the seven TPACK domains.

Table 1. Descriptive Statistics of EFL Teachers' TPACK Preparedness

TPACK Domain	N	Mean	SD	Minimum	Maximum
Technology Knowledge (TK)	51	3.72	0.63	2.51	4.59
Pedagogical Knowledge (PK)	51	4.15	0.32	3.63	4.53
Content Knowledge (CK)	51	4.18	0.29	3.92	4.69
Technological Pedagogical Knowledge (TPK)	51	4.15	0.07	4.06	4.24
Pedagogical Content Knowledge (PCK)	51	4.23	0.11	4.08	4.41
Technological Content Knowledge (TCK)	51	3.92	0.16	3.76	4.08
TPACK	51	3.84	0.07	3.73	3.90

Among the seven domains, Pedagogical Content Knowledge (PCK) obtained the highest mean score ($M = 4.23$, $SD = 0.11$), followed by Content Knowledge (CK) ($M = 4.18$, $SD = 0.29$), Pedagogical Knowledge (PK) ($M = 4.15$, $SD = 0.32$), and Technological Pedagogical Knowledge (TPK) ($M = 4.15$, $SD = 0.07$). These findings indicate that teachers perceived themselves as highly competent in combining pedagogical approaches with English language content and integrating technology into instructional practices.

Technological Content Knowledge (TCK) ($M = 3.92$, $SD = 0.16$) and overall TPACK ($M = 3.84$, $SD = 0.07$) were also rated positively. However, Technological Knowledge (TK) recorded the lowest mean score ($M = 3.72$, $SD = 0.63$), suggesting that technological competence remained the weakest component among the participants. The notably higher standard deviation for TK ($SD = 0.63$) compared to other domains also reveals considerable variability among participants, indicating that while some teachers reported strong technological competence, others experienced substantial gaps in this area. This distribution suggests that TK is the most heterogeneous component of TPACK preparedness in this context and warrants targeted attention in any professional development initiative. It is important to note that all scores are based on teachers' self-reported perceptions, and perceived competence does not necessarily correspond to observed classroom behavior. These figures should therefore be interpreted as reflections of teachers' self-efficacy beliefs regarding their TPACK rather than as direct measures of actual technology-integration practices.

Challenges in Technology-Integrated EFL Teaching

Thematic analysis of the interview data revealed two primary challenge themes as summarized in Table 2.

Table 2. Overview of Teachers' Challenges

Theme	Sub-themes
Engaging Students in Online EFL Teaching	Designing interactive teaching: Time limitation
Motivating Students in an Online Classroom	Camera-off behavior; Shyness and reluctance to participate

Engaging students in online EFL teaching. The shift to online instruction during the pandemic required teachers to redesign their instructional approaches to maintain student engagement within

restricted time frames. Two sub-themes emerged under this challenge: designing interactive teaching and time limitation, each of which is elaborated below. Regarding time limitations, most schools imposed 30–45-minute session limits, which constrained teachers' ability to deliver complete lessons in real time. Most schools imposed 30–45-minute session limits, which constrained teachers' ability to deliver complete lessons in real time. As one teacher remarked:

"We are only allowed to have 30 minutes of learning, so 30 minutes maximum ... no more than that because they will be late for the other class." (KH)

To compensate, teachers resorted to distributing materials and activities asynchronously through messaging platforms:

"I will send the handout—in a Word document—to the WhatsApp group ... they will do it after the meeting and will take a picture and send it back." (DP)

However, this asynchronous approach created a pedagogical dilemma: while it allowed content delivery to continue, it reduced the urgency for students to engage actively during live sessions. As one teacher noted: *"When I send them materials through WhatsApp after the meeting, students feel they can always access it later, so they don't pay attention during the online class"* (FS). This pattern suggests that the shift to asynchronous delivery, while compensatory, inadvertently undermined the interactive and communicative dimensions of EFL learning that synchronous sessions were designed to provide. Regarding the sub-theme of interactive teaching design, teachers also reported that it was considerably more difficult to create engaging activities within the constraints of a 30–45-minute online session than in face-to-face instruction. The reduced session time meant that activities requiring sustained interaction — such as role plays, pair work, or communicative tasks — had to be significantly shortened or eliminated. One teacher reflected: *"In class we can do many activities, but online we have to choose only one because the time is very limited ... we have to be very selective"* (KH). This sub-theme reveals that time constraints were not merely logistical inconveniences but structural constraints that reshaped the entire scope of EFL instructional design during online learning—motivating students in virtual classrooms. Student disengagement was reported as a recurring challenge during synchronous online sessions. Teachers observed that students frequently turned off their cameras and microphones, effectively withdrawing from the learning environment:

"Students often just switch the camera off and do other activities... when teachers ask questions, nobody answers—just mute and camera off." (WB)

"We can notice when students switch their camera off; often, they just play online games ... because parents do not supervise them." (LU)

In addition to disengagement, teachers identified student passivity rooted in fear of making errors as a persistent obstacle:

"Students are often shy... they are afraid to make mistakes in pronouncing words and sentences." (DP)

Teachers' Strategies for Addressing Technology Integration Challenges

The qualitative findings also identified four strategic themes that teachers employed to address these challenges, summarized in Table 3.

Table 3. Overview of Teachers' Strategies

Theme	Sub-themes
Utilizing Digital Media for EFL Teaching	WhatsApp; Google Classroom; Google Meet; Microsoft Teams; School Website
Technology-Based Learning Assessment	Google Forms; MS Form; Portfolio
Interactive Instructional Design	Pictures; Videos; Songs
Online Classroom Management	Camera-on policy; Group assignments; Removal from session

Utilizing digital media for EFL teaching. Teachers demonstrated initiative in selecting and adopting various digital platforms suited to their school contexts. Commonly used platforms included Google Meet, Google Classroom, Microsoft Teams, and WhatsApp—practical considerations, including accessibility, application size, and licensing, guided platform selection. The licensing factor, in particular,

reflected the institutional and economic constraints faced by schools in Ambon: teachers reported that platforms requiring paid subscriptions or institutional accounts were often not available to them, making free or pre-installed applications the default choice. As one teacher explained: "*We cannot use Zoom because the school does not have a subscription and the free version is only 40 minutes ... so we prefer Google Meet or Teams because those are free and already on our devices*" (WB). This constraint illustrates how institutional resource limitations, rather than individual pedagogical preferences, often determined the technological tools available to EFL teachers in this context:

"We use Google Meet because it is small and already installed on the phone and can hold many participants in a meeting." (LU)

"We choose to use Microsoft Teams because it is already on the laptop and it is easier for us—teachers—to use." (WB)

Technology-based learning assessment. Teachers also employed digital tools to streamline student evaluation. Google Forms and MS Forms were frequently used to design auto-graded exercises, while portfolios served as an alternative form of holistic assessment:

"Google Forms are quite easy to use because teachers can just post the assignments and set the time and possible answers ... make it easy for us to grade students' assignments." (FS)

"We use MS Form ... we create the test, for example, the multiple choice and set the answers ... if the students finish the test, the result will be available in Excel." (RP)

Interactive instructional design. To sustain student engagement, teachers incorporated multimedia elements, including images, videos, and songs, into their lessons. The use of visual and audiovisual content was considered particularly effective:

"We cannot just talk about Cinderella or show text of Cinderella; we can use video ... so students become connected to the story." (RP)

"Vocabulary benefits the most from online platforms, as we can put many words that students can see ... using pictures, we can teach them vocabulary." (WB)

Teachers also recognized the importance of contextualizing content to students' interests:

"The boys are not enthusiastic if we give them topics on singers or artists, but the girls love it, especially if it is about a K-pop singer." (AL)

Online classroom management. To maintain discipline and participation, teachers enforced a camera-on policy and utilized the authority to remove disengaged students from sessions:

"I ask them guiding questions about the topics ... the camera has to be on; if not, I will ask them directly or privately." (DP)

"Because the meeting is short, we need to be efficient ... after I ask several times, I will remove them from the meeting." (FS)

Group-based assignments were also used to encourage peer interaction and maintain a sense of social presence in the virtual classroom.

DISCUSSION

TPACK Preparedness among EFL Teachers in Eastern Indonesia

The findings indicate that EFL teachers demonstrated a generally high level of TPACK preparedness, particularly in Pedagogical Content Knowledge (PCK), Content Knowledge (CK), and Pedagogical Knowledge (PK). These results suggest that teachers were confident in their ability to teach English content and apply appropriate pedagogical approaches. The relatively high scores in Technological Pedagogical Knowledge (TPK) and overall TPACK further indicate that teachers were able to integrate technology into their instructional practices. This finding supports the TPACK framework, which emphasizes the interaction between technology, pedagogy, and content knowledge as the foundation of effective technology integration (Koehler & Mishra, 2009).

However, Technological Knowledge (TK) received the lowest score among all domains, indicating that technology remains the most challenging aspect of teachers' professional competence. This finding is consistent with previous studies reporting that teachers generally demonstrate stronger pedagogical and content knowledge than technological competence (Prasojo et al., 2020). Moreover, this finding is consistent with Aniq et al. (2022) and Lisia et al. (2024), who reported that teachers generally demonstrated positive perceptions of technology integration while continuing to experience limitations

in technological competence and implementation. A comparable pattern was reported by [Abubakir & Alshaboul \(2023\)](#), who found that in-service EFL teachers in Qatar demonstrated high overall TPACK but consistently scored lowest in the Technological Knowledge domain, confirming that TK is the weakest component across EFL contexts. Nevertheless, the overall TPACK score suggests that teachers in Eastern Indonesia have adapted reasonably well to technology-enhanced teaching practices despite contextual limitations.

Challenges in Technology-Integrated EFL Teaching

The qualitative findings identified two primary challenge themes: engaging students in online learning and maintaining motivation in virtual classrooms. These challenges reflect broader issues of student participation and affective engagement in technology-mediated instruction documented in the literature ([Mulyono, Ismayama, et al., 2021](#); [Ria, 2021](#)).

The time constraints imposed by schools—limiting synchronous sessions to 30–45 minutes—significantly restricted teachers' ability to deliver complete lessons and maintain interactive learning activities in real time. This institutional constraint compelled teachers to adopt asynchronous instructional approaches, which, while compensatory, inadvertently reduced students' incentive to engage actively during live sessions. This finding resonates with the observations of [Saputra et al. \(2022\)](#) and [Akram et al. \(2022\)](#) that structural and institutional factors — including internet instability, insufficient ICT infrastructure, and limited teacher training — significantly mediate teachers' effectiveness in technology-integrated instruction.

Student disengagement, as evidenced by camera-off behavior and passive participation, was a pervasive challenge reported by all interview participants. The anonymity afforded by online platforms appeared to facilitate disengagement, as students could effectively disengage without immediate accountability. Additionally, student reticence rooted in fear of error was reported as a persistent barrier to participation, a challenge not unique to online settings but potentially amplified by the perceived distance of virtual instruction. These findings are consistent with [Mulyono, Ismayama, et al. \(2021\)](#), who noted that poor student participation in online classrooms remains one of the most significant obstacles to effective technology-mediated language learning. The challenges identified in this study are similar to those reported by [Nartiningrum & Nugroho \(2021\)](#), who found that online EFL teaching was often hindered by limited interaction, low student participation, and difficulties with classroom management. Likewise, [Dwipayanti et al. \(2024\)](#) emphasized that learner engagement remains a major concern in post-pandemic and blended learning environments.

Strategies for Technology-Integrated EFL Teaching

The findings reveal that EFL teachers demonstrated considerable initiative and adaptability in developing strategies to address the challenges of online instruction. Specifically, four strategic themes emerged from the qualitative data — digital platform utilization, technology-based assessment, interactive instructional design, and online classroom management — each of which directly corresponds to the challenges of engagement and motivation identified under RQ2. These strategies collectively illustrate how teachers translated their TPACK knowledge into responsive instructional practices: when time constraints limited synchronous engagement, they turned to asynchronous platforms; when student motivation faltered, they deployed multimedia and culturally relevant content; and when disengagement was detected, they implemented classroom management protocols to restore accountability. Their approaches encompassed digital platform utilization, technology-based assessment, interactive instructional design, and online classroom management, collectively reflecting a practical application of TPACK in real-world teaching contexts.

Teachers' platform selection was pragmatically driven by considerations of accessibility, cost, and ease of use, with Google Meet, Microsoft Teams, and WhatsApp emerging as the most frequently used tools. This aligns with [Habibi et al. \(2018\)](#), who noted that EFL teachers tend to favor platforms that are familiar, accessible, and compatible with students' existing devices. The extensive use of WhatsApp observed in this study also supports findings by [Mulyono, Ismayama, et al. \(2021\)](#), who highlighted the platform's effectiveness in facilitating communication and supporting online learning in Indonesian

educational contexts. However, it is also worth critically reflecting on what the pervasive use of WhatsApp as a primary instructional channel reveals about the institutional landscape of EFL teaching in Ambon. WhatsApp is a personal messaging application not designed for educational purposes, and its adoption as a *de facto* learning management system points to the absence of institutional infrastructure — such as school-subscribed learning platforms or device procurement programs — rather than a deliberate pedagogical choice. This finding suggests that teachers in this context were not merely selecting among available tools based on preference but were navigating severe resource constraints that shaped their technological options from the outset. The adoption of portfolio-based and form-based assessments further demonstrates teachers' efforts to leverage technology for more efficient and systematic student evaluation (Lekatompessy & Lekatompessy, 2025).

The integration of multimedia elements—including videos, images, and songs—into instructional design reflects teachers' awareness of the role of multimodal input in supporting language acquisition. Research by Golonka et al. (2014) and Kabilan et al. (2010) has consistently highlighted the effectiveness of digital multimedia resources in enhancing vocabulary development, listening comprehension, and overall language engagement. The teachers' creative use of culturally relevant content, such as K-pop references, also indicates an emerging awareness of culturally responsive pedagogy in technology-mediated EFL instruction. The use of multimedia resources to increase student engagement is also consistent with recent evidence highlighting the potential of emerging technologies and AI-supported tools to enhance learners' motivation and participation in EFL learning (Song & Song, 2023).

Online classroom management strategies, including camera-on enforcement and session removal as disciplinary measures, reflect teachers' efforts to maintain a structured and accountable learning environment within the constraints of virtual instruction. While these measures may be effective in the short term, they also underscore the need for more sustainable pedagogical approaches that foster intrinsic student motivation and active participation. Professional development initiatives that equip teachers with strategies for student engagement in digital learning environments would complement the reactive classroom management techniques currently employed. Taken together, the four strategic themes documented in this study represent a coherent practical response to the two challenge themes identified in RQ2: time constraints and difficulties with interactive design were addressed through platform selection and assessment tools that extended learning beyond synchronous sessions. At the same time, student disengagement and motivational barriers were tackled through multimedia instructional design and classroom management protocols. This challenge-strategy correspondence demonstrates how TPACK functions not merely as a theoretical framework but as an adaptive practice that teachers develop iteratively in response to their specific contextual demands. As artificial intelligence tools increasingly enter educational settings, future research in Eastern Indonesia should examine how teachers' existing TPACK competencies — particularly in the TK domain identified as the weakest in this study — might need to be expanded to accommodate AI-enhanced EFL instruction.

CONCLUSION

This study examined EFL teachers' TPACK preparedness, the challenges they encountered in technology-integrated teaching, and the strategies they employed to address those challenges in Eastern Indonesia. The findings revealed that teachers generally demonstrated a high level of TPACK preparedness, particularly in pedagogical and content-related domains. Although technological knowledge emerged as the least developed component, the overall findings indicate that teachers could integrate technology, pedagogy, and content knowledge to support English language teaching.

The study also identified several challenges associated with technology-integrated instruction, particularly maintaining student engagement and participation in online learning environments. To address these challenges, teachers employed a range of strategies, including digital learning platforms, technology-based assessment tools, interactive multimedia resources, and classroom management techniques. These strategies illustrate how teachers translated their TPACK knowledge into practical instructional practices.

The findings highlight the importance of continuous professional development to strengthen teachers' technological competencies and support effective technology integration in EFL classrooms. In particular, the identification of Technological Knowledge (TK) as the weakest TPACK domain in this study has a direct implication for professional development design: programs targeting EFL teachers in Ambon should prioritize hands-on, context-specific technology training that helps teachers move beyond awareness of digital tools to confident, pedagogically integrated deployment of those tools in their actual classroom conditions. Future professional development initiatives should also incorporate innovative TPACK development strategies that support teachers' technological, pedagogical, and content-related competencies in rapidly evolving digital learning environments (A. Ali & Waer, 2023; Ye et al., 2024). The study contributes to the growing body of research on TPACK in underrepresented contexts by closing a specific and previously unaddressed gap: no prior peer-reviewed study had empirically investigated the TPACK preparedness, technology integration challenges, and coping strategies of junior high school EFL teachers in Ambon, Eastern Indonesia simultaneously. For teacher education programs in Eastern Indonesia, these findings offer actionable evidence that professional development should address not only teachers' technological knowledge deficits but also the institutional and infrastructural constraints that shape what technologies are available for use in schools across the region. However, the study was limited to junior high school EFL teachers in Ambon City and involved a relatively small number of interview participants. Future research may involve larger and more diverse samples across different educational levels and regions to provide a broader understanding of teachers' TPACK development and technology integration practices. Future studies may also examine how post-pandemic hybrid and blended learning contexts have reshaped the challenges and strategies reported here, given that the present findings were collected at the height of emergency online instruction in 2021.

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