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TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE COMPETENCY OF CERTIFIED ENGLISH TEACHERS

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Abstract: Advancements in technology have significantly impacted the integration of technology into educational practices. However, incorporating technology into teaching remains challenging, mainly due to the insufficient training received by some educators in this area. Effective technology integration, particularly in English as a Foreign Language (EFL) settings, necessitates the use of the Technological Pedagogical Content Knowledge (TPACK) framework. This study examined the TPACK competencies of certified high school English teachers. A case study method was employed as it was deemed the most suitable approach for this research. Data were collected through semi-structured interviews with five certified high school English teachers. The findings revealed that the participants considered themselves proficient in nearly all sub-dimensions of TPACK. The study concluded that certified high school English teachers possess a strong understanding of TPACK and the ability to apply it effectively. This study highlights the importance of raising awareness among English teachers regarding the TPACK framework. Ultimately, it contributes to developing English teachers' competencies through TPACK, thereby enhancing the quality of the teaching and learning process.

Keywords: certified high school English teacher; technology advancement; technological pedagogical content knowledge.

INTRODUCTION

Technology has become crucial in education (Szymkowiak et al., 2021). To stay current with the global tech revolution, the education sector must embrace contemporary tools like computers, multimedia devices, smartphones, audio/visual applications, and social media. These technologies are essential for enhancing English instruction and enabling teachers to engage with students in a more organized and advanced manner. Using technology in English teaching strengthens the unified approach of modern tools and their integration with other elements, which helps students achieve the desired outcomes (Mofareh, 2019).

Advancements in technology play a crucial role in preparing students to apply their knowledge across various subjects to secure their positions in the workforce. Technology enhances the learning process and acts as a genuine educational tool, enabling effective learning to take place. Technology offers diverse opportunities to make the learning process more engaging, innovative, and enjoyable by presenting

familiar content in new ways (Stecuła & Wolniak, 2022). For example, it can involve gamification, virtual field trips, and various online learning resources. Additionally, technology can significantly boost active participation in learning (Tuma, 2021), which can be challenging to achieve through traditional teaching methods.

Technology should be seen not merely as a tool but as an integral component of the educational system and learning process. Using media technology in the classroom proves highly beneficial and enhances student engagement in learning (Carstens et al., 2021). Consequently, teachers must incorporate technology into language instruction.

Incorporating technology into the classroom allows both teachers and students to acquire a wide range of skills essential for future success. Modern education emphasizes collaboration, problem-solving, critical thinking, communication, leadership, and enhancing motivation and productivity. Furthermore, technology aids in developing practical skills such as creating presentations, distinguishing reliable from unreliable online sources, practicing proper online etiquette, and writing emails. These skills are crucial and can be effectively cultivated within the classroom environment (Prayudi et al., 2021).

To effectively contribute to the learning process, teachers must enhance their pedagogical and content knowledge and adeptly integrate technology to align with the demands of the 4.0 era. The pivotal role of technology in contemporary and future contexts necessitates its incorporation into educational practices. As a result, numerous instructional activities are increasingly facilitated through technological tools such as mobile devices, smartboards, MOOCs, tablets, laptops, simulations, dynamic visualizations, and virtual laboratories have altered education in schools and institutions (Haleem et al., 2022).

A teacher must be able to utilize existing technology to create learning media that facilitates an engaging educational process for students. This is because technology-enhanced media can boost student motivation and enthusiasm, reduce boredom, and further simplify the teacher's delivery of content to learners (Larasati & Widyasari, 2021). However, many English teachers in Indonesia face difficulties incorporating technology into their teaching materials, often stemming from inadequate training and resource availability. These challenges include limited opportunities for professional development and restricted access to suitable technological tools, which impede their ability to effectively integrate visual aids and digital resources into their instructional practices (Irasuti & Bachtiar, 2024).

Teachers need both knowledge and skills to implement digital technology into the teaching and learning process, specifically through the competencies of Technological Pedagogical Content Knowledge (TPACK). TPACK is a framework that integrates aspects of technological knowledge and content knowledge, thereby creating a new paradigm for teaching or delivering instructional material through technology. It emphasizes the effective use of technology, pedagogy, and content to support and enhance technological knowledge (Yurinda & Widyasari, 2022). Effective implementation of technology in education, particularly in English as a Foreign Language (EFL) settings, should

encompass teachers' Technological Pedagogical Content Knowledge (TPACK).

There are seven components of Technological Pedagogical Content Knowledge (TPACK), namely Technological Knowledge (TK), Pedagogical Knowledge (PK), Content Knowledge (CK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), Pedagogical Content Knowledge (PCK), and Technological Pedagogical Content Knowledge (TPACK). A professional teacher must possess adequate TPACK competencies. Teachers must understand the three fundamental components of effective teaching content, pedagogy, and technology and the interrelationships among these elements (Adipat, 2021). Teacher certification can serve as an indicator of a teacher's professionalism.

However, despite many papers written on teachers' TPACK, most studies only focus on preservice and science teachers. Little empirical research has focused on in-service EFL teachers who are already certified. To fill the gap in TPACK research in the EFL domain, there was a need to explore how certified English teachers' technological pedagogical content knowledge competence during the teaching practice to optimize their teaching. Therefore, the objective of this study was to investigate the competency of TPACK of certified English teachers at the high school level.

METHOD

A case study design was chosen to examine certified high school English teachers' TPACK competency. Selecting fewer than four or five participants allows for ample chance to detect case-specific patterns and cross-case theme analysis. The case study is descriptive.

The study investigated five professional high school English teachers from five public schools in Jayapura City to examine the seven TPACK domains. The respondents were selected using purposive sampling strategies focusing on specific criteria: they were certified English teachers with professional teaching experience, actively teaching at public high schools in Jayapura City, and considered representative of diverse educational contexts within the region. All were assigned pseudonyms.

To collect the data, this study used an interview instrument that was mainly applied to learn how EFL teachers implement technological pedagogical content knowledge (TPACK) in the teaching and learning process. Therefore, the interview themes applied TPACK of EFL teachers and its components during the teaching and learning process. It was a semi-structured interview whose items were adopted by the researchers from Nazari et al. (2019). Key indicators included teachers' knowledge of technology integration, strategies for applying TPACK in lesson planning and classroom instruction, challenges faced in using TPACK, and perceptions of its effectiveness in enhancing student learning outcomes. The interviewer scheduled a convenient time for each interviewee to do the face-to-face interview. Each interview took between 35 and 50 minutes. The interviews will be recorded using a DVR (Digital Voice Recorder) with the interviewees' consent to prevent data loss.

There were three stages of analysis of data, i.e., data reduction, data presentation, and conclusion. To begin, the researcher selected, concentrated, and summarized the data during the data

reduction stage. The researcher then included irrelevant or erroneous information in his or her study operations. Second, in the data display stage, the researcher presented the data in descriptive form. The researcher described the findings descriptively using field examples. The data were structured logically and methodically. Third, in the conclusion stage, the researcher drew the conclusion based on interviews. The researcher was inclined to accumulate and formulate interpretations to verify the findings in the conclusion.

RESULT AND DISCUSSION

TPACK refers to teachers' knowledge of when, where, and how to increase students' competence by using appropriate instructional strategies and supporting technologies. Numerous educational institutions have incorporated it to aid teachers in developing their TPACK and promote technology-related instructional activities (Tseng et al., 2019). At the nexus of these three modes of knowledge is a natural grasp of instructional content through suitable teaching practices and equipment. This study examined TPACK in the context of EFL teaching. All data was obtained through interviews with the participants. The following are the results of the research.

Content Knowledge Domain

The data in the first area, namely Content Knowledge (CK), showed that the CK level of the majority of participants was excellent. They appeared to have confidence in their fundamental knowledge of English, i.e., developing knowledge through comprehension of the subject and systematically conveying the material. Teachers have a firm grasp of how students acquire a foreign language. For example, participant R1 said that he could explain the grammatical features of the English language. He also revealed that he has a variety of methods and tactics for expanding my knowledge of EFL. He asserted that he possessed a broad and in-depth knowledge of the instructional materials. He could determine whether the subject would be simple for kids to learn or not, as well as the anticipation.

Additionally, it demonstrated that they were capable of incorporating learning objectives into a piece of material. For instance, participant R2 stated that one of his students' learning objectives was to interpret narrative material. Students responded that they were capable of elucidating narrative material in class. They might simplify material concepts by dividing them into straightforward content and symbolic forms. R3 indicated no difficulty locating scholarly sources and resources for more material. Moreover, R3 said that she can maintain the use of English in the classroom. These examples demonstrated that English teachers could organize material by providing it and separating it into simple-to-understand notions or components.

It was consistent with Absari et al. (2020) empirical investigation, which concluded that sub-content knowledge positively impacted TPACK. Li et al. (2022) further corroborated this, discovering that teachers' CK levels in this research were also relatively high. Thus, teachers' content expertise influences how they convey material to their pupils.

Pedagogical Knowledge Domain

The findings in the second area,

Pedagogical Knowledge (PK), indicated that most teachers possess a reasonable degree of PK. It demonstrated that they were capable of selecting appropriate teaching materials for the needs of learners. They could manage the teaching-learning process in the classroom, including student understanding, planning, implementation of learning, assessment of learning outcomes, and actualizing all potential students. Participant R5 said that she initially needed to create a pleasant atmosphere to attract students' attention. Besides, R4 affirmed that she can adapt her teaching style to different learners. Also, she asserted that she could manage activities for individual, partner, group, and whole-class work.

English teachers' activities in teaching and learning through the PK demonstrated that they could provide understanding to students by actualizing all potential students through the construction of the groups, ensuring that students have good comprehension. The majority of participants stated that they stayed informed about professional development opportunities for English instructors through the English teachers' forum. Additionally, it was recognized that PK is critical since it establishes the learning objectives. However, some participants were not maximal in assessing student learning in multiple ways.

The findings were supported by the study from Kurniasih (2023), which stated that teachers' pedagogical knowledge reflects a strong comprehension and application, primarily because they are well-versed in diverse teaching methods and strategies and can effectively adapt them to suit particular situations. In line with this, Nopriyeni and Sulaiman (2022) revealed that the pedagogical knowledge of prospective teachers in implementing a mentoring program can be classified as advanced, enabling them to enhance their teaching practice experiences. However, the findings contrast with the study from Mpofu et al. (2023), which revealed that teachers need to be stronger in content knowledge and pedagogical competencies, which are essential for effective learning.

Pedagogical Content Knowledge Domain

The findings in the third aspect, namely Pedagogical Content Knowledge (PCK), showed that the PCK level of the majority of participants was good. It revealed that the majority of participants possessed a high level of PCK. It was discovered that they could select authentic English language resources to suit student needs (e.g., news, magazines). R3 stated that she can provide target language input at an appropriate level of difficulty. They created their educational administration, such as lesson plans, syllabi, annual programs, and semester programs. It might be argued that education administrative preparation is essential since it serves as a determinant and director of the direction to be attained.

Furthermore, they were able to give appropriate feedback on learner language. As a result, they could choose a proper approach to teach learners (i.e., communicative approach, direct method). As R4 said, she used some methods to teach her students; it was based on what material she would teach them. Besides, the application of English language development that they used while teaching the content resulted in students becoming more creative and imaginative in their classroom learning. As a result,

they looked to have a thorough understanding of the material (content) and how to teach it, implying that English teachers could develop their students to become experts. Several of them used instructional games, such as puzzle games, to help pupils improve their skills. Nevertheless, two participants (R2 and R5) believed that technology was unnecessary for their instruction.

The present finding is reinforced by the study from Santoso et al. (2019), who revealed that the capability of PCK was good. Indonesian Language teacher candidates excel in preparing Learning Implementation Plans (RPP), as evidenced by their ability to align the material with appropriate strategies, media, and learning evaluations. Teachers should cover pedagogical subject knowledge thoroughly because it entails all of the cognitive information necessary for constructing effective teaching and learning settings. Moreover, the findings also supported by Sarıçoban et al. (2019) found that the participants feel competent in managing a classroom environment, adapting a lesson plan following students' skills, and evaluating students' learning process.

Technological Knowledge Domain

The findings in the fourth aspect, namely Technological Knowledge (TK), showed that the TK level of the majority of participants was good enough. It demonstrated that most of them were familiar with mobile technologies (e.g., tablet computers and smartphones). Additionally, a few individuals could use the software in video players, music players, Microsoft Word, Microsoft Excel, and Microsoft PowerPoint. Nonetheless, most of them were infrequent users of online learning programs, such as Edmodo. They were only familiar with one application, Google Classroom. Participant R1 stated that he is still learning how to tackle his technical problems. This is especially true when operating an online learning program.

It revealed that they could leverage computer software technology. They used TK as a practical learning tool in teaching and learning activities regarding computer device expertise. Additionally, it demonstrated that they employed a laptop, a tablet, an audio system, and other devices to aid in classroom learning and incorporated device utilization (software) through the use of a Microsoft PowerPoint slide presentation. As a result, their pupils were ecstatic about progressing and personally contributing to the material. The majority of interviewees said that they attempted to include technology in the classroom as frequently as possible.

These findings are also in line with a study conducted by Naing & Wiedarti (2023), which concluded that EFL teachers' TPACK mastery, specifically Technological Knowledge (TK), is in an outstanding category. It is critical to incorporate technology into classroom instruction. Teachers gained a wealth of information and were more at ease delivering their material using technology. Additionally, the study by Abubakir and Alshaboul (2023) corroborated the findings of this study. It was discovered that teachers with 1 to 5 years of experience scored at the highest level of technological knowledge. Teachers love using technology in their teaching processes and believe it benefits their teaching and learning processes.

However, the present finding is in contrast with the study from Huang et al. (2022), which found that the value of technological knowledge (TK) is the

lowest. These indicate that EFL teachers do not feel very competent in technological knowledge. Also, Mukminin & Habibi (2020) revealed that most Indonesian EFL teachers' technology profiles indicated that they had been exposed to technology between one to five years, which might cause a low level of TK, TCK, and TPACK.

Technological Content Knowledge Domain

The findings in the fifth aspect, namely Technological Content Knowledge (TCK), showed that the TCK level of the majority of participants was good enough. It demonstrated that they could select primary competency material in English learning that was appropriate for technology-assisted instruction. Additionally, they could use the right technology and multimedia resources to facilitate the learning process, such as LCDs and laptops. Nonetheless, most of them rarely assigned students to work using Microsoft PowerPoint, instructional videos, or electronic books. Participant R2 stated that he used to utilize a few online platforms, and for instance, he reserves WhatsApp exclusively for online communication. He admitted that he founded WhatsApp to facilitate online communication. R3 stated that he assigned his students to watch English films to broaden their vocabulary. Also, they frequently used Gmail to facilitate their students sending students work.

These findings were corroborated by the study from Fauziah et al. (2023), which revealed that all English teachers demonstrated proficiency in utilizing various technologies for instructional purposes and effectively integrating these with pedagogical approaches to achieve learning objectives. This indicates that the English teachers as the participants possess a strong understanding of Technological Content Knowledge (TCK). Using technology also helped teachers work when making a lesson plan related to the content of material until it is executed in the teaching and learning process. Nevertheless, the previous study by Schmid et al. (2021) stated that the competencies related to teachers' technological skills and Technological Content Knowledge (TCK) were identified as the least developed. To improve teachers' technological literacy, ICT training centers staffed by ICT professionals at both national and provincial levels should be established.

Technological Pedagogical Knowledge Domain

The findings in the sixth aspect, Technological Pedagogical Knowledge (TPK), showed that the TPK level of the majority of participants was pretty good. It was discovered that they had produced their information technology learning materials before starting the learning process. They could learn through the use of computer apps. They are capable of delivering material through information technology media. The majority of them recommended that students utilize educational applications or tools they were familiar with through the English teacher forum. Participant R4 stated that she frequently proposes to her pupils that they use educational applications or programs. Additionally, she shared E-books and E-tests with students so they could study the subject on their phones. She said that she distributed e-books and e-tests to her students so that they could learn the content on their phones.

Several of them utilized laptops and computer software, such as Microsoft PowerPoint apps, when utilizing

technology-based media. For example, they could offer the subject to pupils via a slide presentation. Additionally, they redirected and explained the trouble-some content using Microsoft PowerPoint. Nevertheless, a few participants did not use the school's wireless network for teaching and learning activities. They reasoned that most students lacked a netbook or laptop to access the internet and that Wi-Fi and other internet services were limited. Another argument given by English professors is that pupils could abuse Wi-Fi, for example, by browsing inappropriate materials.

A study by Aniq et al. (2021) supports the current findings, indicating that the majority of teachers demonstrated a sufficiently high level of Technological Pedagogical Knowledge (TPK). The study highlighted that these teachers had independently developed their information technology-based learning materials prior to the commencement of the teaching process. Also, the study by Nisa and Ramadhan (2023) found that the TPK level of teachers was excellent. Incorporating ICT into the educational process can replace traditional teaching methods with technology-based instruction. The study concluded that integrating ICT into the teaching and learning process could develop a novel teaching technique. Additionally, it may pique students' interest.

Technological Pedagogical and Content Knowledge Domain

The findings in the last aspect, namely the Technological Pedagogical and Content Knowledge Aspect (TPACK), showed that most teachers' TPACK level was good enough. It revealed that English teachers were good enough and capable of developing a blend of technological, pedagogical, and content abilities. It showed that English teachers' TPACK consideration was good enough as R4 stated that she can select technologies to use in her classroom that enhance what she teaches, how she teaches, and what students learn. English teachers could apply seven aspects of TPACK, i.e., Technological Knowledge, Pedagogical Knowledge, Content Knowledge, Pedagogical Content Knowledge, Technological Content Knowledge, Technological Pedagogical Knowledge, and Technological Pedagogical and Content Knowledge. However, several of them were unfamiliar with the phrase TPACK. While some of them admitted to teaching material using a proper teaching technique and supported technologies based on the TPACK framework, others admitted to teaching material utilizing technology to make the information more amazing to students but had no idea what the term meant.

The findings indicated that participants had a better level of knowledge about PK, PCK, and CK than they did about TK, TCK, TPK, and TPACK. The majority of them said that CK and PK were more critical in their instructional learning process than technology-related knowledge. The findings of this study corroborated those of Rica & Commons (2024), who stated that participants generally had a high level of TPACK proficiency. This indicated that participants demonstrated a strong understanding of integrating technology into their teaching practices effectively while aligning it with pedagogical strategies and content knowledge. Their ability to utilize digital tools in a way that enhances learning outcomes reflects their advanced competence in navigating the intersection

of these three domains. Such proficiency suggests they are well-equipped to adapt to modern educational demands and foster an engaging learning environment.

Further supporting the findings of the present study, research by Syafi'i & Anam (2022) revealed that Indonesian EFL teachers exhibited a high level of Technological Pedagogical Content Knowledge (TPACK) in the post-pandemic era. The reason could be that the use of ICT in EFL teaching in Indonesia was relatively recent. So, EFL teachers were more likely to adhere to the use of ICT in teaching. Moreover, Darsih et al. (2023) also found that the Technological Pedagogical Content Knowledge level of English lecturers is primarily high. They perceive themselves as having a firm grasp of Technological Pedagogical Content Knowledge (TPACK), including the ability to integrate technology into the curriculum effectively. This encompasses employing teaching methods that go beyond teacher-centered approaches to include student-centered practices and implementing integrated learning strategies to foster innovative instructional communication.

CONCLUSION

The study discovered that certified high school English teachers perceive themselves to be sufficient in practically all TPACK sub-dimensions. The certified high school English teachers possess sufficient knowledge and abilities to apply what they have learned in terms of TPACK. Certified high school English teachers have a firm grasp of and mastery of TPACK. They shared some effective technology pedagogical content knowledge tactics that they employed in the classroom to engage students and make learning more enjoyable and meaningful. This study will help better understand the TPACK framework's significance in the EFL environment. According to the study, the more teachers understood the TPACK framework, the more likely they were to use ICT successfully and adequately. Thus, professional development that focuses on teachers' knowledge and how to enhance teachers' TPACK, rather than just on technical aspects, is advised.

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