EFL Teachers' Self-Efficacy in Technology Integration: A Case Study on TPACK Implementation in Schools in Indonesia

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ABSTRACT

This study aims to explore English teachers' self-efficacy in integrating technology in the classroom and the application of the TPACK (Technological Pedagogical Content Knowledge) framework. This study also seeks the relationship between teacher self-efficacy and TPACK implementation when using technology in teaching. The study subjects consisted of 50 English teachers, with three teachers selected for classroom observation and retrospective interviews. The results showed that the majority of teachers had high self-efficacy in using technology such as PowerPoint, videos, and online platforms. However, some still lacked confidence in providing digital feedback. TPACK implementation varied; two teachers implemented it optimally by integrating content, pedagogy, and technology for interactive learning, while one teacher remained passive. There was a positive relationship between teacher self-efficacy and successful TPACK implementation. Teachers with high self-efficacy were more proactive in designing innovative learning. These findings have important implications for teacher training and education policy. Improving self-efficacy through technology training can improve the quality of technology-based learning.

Keywords: Teacher self-efficacy, technology integration, TPACK, English teaching.

INTRODUCTION

The use of technology in education has become an increasingly relevant topic in recent decades, especially with the rapid developments in the field of information and communication. [1]As part of this transformation, teachers are required to not only master the subject matter but also have the ability to integrate technology effectively into the learning process. [2]One theoretical framework used to understand how teachers can combine knowledge of content, pedagogy, and technology is Technological Pedagogical Content Knowledge (TPACK). Furthermore, the concept of self-efficacy is also important because it influences teachers' confidence in using technology in the classroom. [3]This study aims to explore how English

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[3] S Setiawan, Ahmad Munir, and Rasyidah Nur Aisyah, "Technological Pedagogical Content Knowledge (TPACK) in Action: Unraveling Indonesian English as a Foreign Language Teachers' TPACK by Implementing Telegram" (2021), https://consensus.app/papers/technological-pedagogical-content-knowledge-tpack-in-setiawan-munir/079d9d629c355774b865ed118633d415/.

teachers' self-efficacy contributes to the integration of technology in their teaching and how TPACK is implemented in practice.

Technological advances have brought significant changes to modern education systems. In many countries, including Indonesia, governments have encouraged the use of technology as a tool to improve the quality of learning and student outcomes. [4]However, despite the increasing development of infrastructure and access to technological devices, the main challenge remains the level of implementation by teachers in the field. Many teachers still face difficulties in selecting and using technology appropriately according to their learning context. [5]This shows that in addition to the availability of technological facilities, internal factors such as self-confidence and pedagogical-technological knowledge are very important in determining the success of technology integration in education. [6].

One important aspect in this regard is teacher self-efficacy in the use of technology. Self-efficacy refers to an individual's belief that they are capable of carrying out a particular task effectively. [7] In the educational context, teachers with high self-efficacy are more likely to try new learning methods, including the use of technology in the classroom. Conversely, teachers with low self-efficacy may be hesitant or even reluctant to use technology due to uncertainty about their ability to navigate complex learning situations. Therefore, understanding how teacher self-efficacy influences technology implementation is an important step in improving the quality of education. [8].

In addition to self-efficacy, the concept of TPACK is also a major focus of this study. TPACK explains that integrating technology into learning is not simply about using digital tools, but must be based on a deep understanding of the interactions between content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK). [9]. The combination of these three knowledges—known as TPACK—becomes the basis for teachers in designing and implementing innovative and meaningful learning. With this background, this study aims to answer the following questions: How is the self-efficacy of English teachers in integrating technology in their teaching? How is the application of TPACK in English teaching

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[6] Hanan Waer and Amira Ali, "Integrating TPACK in Pre-Service Teachers' EFL Course: Impacts on Perception, Knowledge, and Practices," *Australian Journal of Teacher Education* (2023), https://consensus.app/papers/integrating-tpack-in-preservice-teachers-'-efl-course-waer-ali/358bf48193d6549ab52f8d1c1d233cb6/.

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[9] Lita Liviani Taopan, "Tpack Framework: Challenges and Opportunities in Efl Classrooms," *Research and Innovation in Language Learning* (2020), https://consensus.app/papers/tpack-framework-challenges-and-opportunities-in-efl-taopan/e5d8ccf1645051b88e7d7b9210aa37e9/.

in the classroom? , Is there a relationship between teacher self-efficacy and the application of TPACK in the classroom?

To answer these questions, this study employed a multi-site case study design involving 50 English teachers as survey respondents. Of these, three teachers were selected for classroom observations and retrospective interviews to obtain more in-depth data. Data were collected through surveys, observations, and interviews, and analyzed quantitatively and qualitatively to provide a comprehensive picture of teacher self-efficacy and the implementation of TPACK in English teaching.

This study aims to explore how English teachers' self-efficacy influences the integration of technology into their teaching and how the TPACK framework is applied in learning practices. By understanding the relationship between self-efficacy and TPACK implementation, this study seeks to provide useful insights for educators, curriculum developers, and policymakers in improving the quality of technology-based learning. Specifically, this study aims to Identifying the level of self-efficacy of English teachers in integrating technology in their teaching. Analyzing the implementation of TPACK in teaching English in the classroom and Explaining the relationship between teacher self-efficacy and the implementation of TPACK in the use of technology in the classroom.

The significance of this research lies in its contribution to enriching understanding of the factors influencing the successful integration of technology in education. The results can be used as a basis for developing teacher training programs, curriculum planning, and developing better education policies. Furthermore, this research is also expected to provide practical recommendations for teachers to improve their ability to use technology effectively in the classroom. Thus, this research not only makes an academic contribution to the field of English language education but also has real implications for improving the quality of education in general.

RESEARCH METHODS

This study employed a multi-site case study design to gain an in-depth and detailed understanding of English language teachers' self-efficacy in technology integration and the application of TPACK in their teaching. A multi-site case study was chosen because it allows for a more comprehensive analysis involving multiple research sites and different subjects, allowing the results to provide a broader perspective. This approach also allows researchers to identify patterns and variations in technology implementation across various English language learning contexts.

The population of this study consisted of English teachers in Surabaya who had used technology in their teaching. From this population, 50 teachers were voluntarily selected to participate in a baseline survey. To obtain more in-depth data, three of the 50 teachers were selected as primary subjects for classroom observations and retrospective interviews. Subject selection was conducted using purposive sampling, based on certain criteria such as a minimum of five years of teaching experience, regular use of technology in learning, and openness to participate in interviews and observations.

The data in this study were collected through three main methods: surveys, classroom observations, and retrospective interviews. The survey was conducted using the Computer Technology Integration Survey (CTIS), an instrument developed to measure teachers' self-efficacy in technology integration. This instrument consists of statements that measure teachers' confidence in using technology in various aspects of teaching, such as the use of learning software, technology-based classroom management, and providing digital feedback

to students. Respondents were asked to rate each statement using a five-point Likert scale, ranging from "very unsure" to "very confident." Classroom observations were conducted to observe the implementation of TPACK in English teaching practices.

Researchers visited the classrooms of three teachers selected as primary subjects and recorded how they combined content knowledge, pedagogy, and technology in the learning process. Aspects observed included the use of digital media, teaching strategies that support the use of technology, and interactions between teachers and students in technology-based learning environments. Following classroom observations, retrospective interviews were conducted to obtain teachers' reflections on the use of technology in their teaching. These interviews focused on teachers' experiences in integrating technology, the challenges they faced, and the strategies they used to overcome these obstacles. Interview questions were designed to explore teachers' understanding of their self-efficacy in using technology and how they apply the TPACK framework in their daily teaching.

Data collected from surveys, observations, and interviews were analyzed quantitatively and qualitatively to provide a comprehensive overview of teacher self-efficacy and the implementation of TPACK in English language teaching. Survey data were statistically analyzed to calculate an average score for teacher self-efficacy in technology integration. An average score was calculated for each aspect of the survey, such as confidence in using learning software, ability to manage a technology-based classroom, and confidence in providing digital feedback. The results of this analysis were used to identify the overall level of teacher self-efficacy and to compare self-efficacy between different teachers. Observation and interview data were analyzed using a qualitative approach to identify patterns and themes in the implementation of TPACK.

The analysis process began with a complete transcription of interview recordings and observation notes. Afterward, the data were grouped into relevant categories, such as the use of technology in English teaching, technology-based learning strategies, and challenges and solutions in technology integration. The themes that emerged from this analysis were then explained descriptively to provide insight into how teachers implemented TPACK in their teaching. To ensure the validity of the data, the researcher used data triangulation, which involves comparing the results from the survey, observations, and interviews to verify the consistency of the information. Furthermore, the researcher conducted member checking by asking teachers to confirm the accuracy of the data interpretations based on the interviews and observations. With this validation approach, the researcher was able to ensure that the research findings reflect the actual reality in the context of English teaching.

RESULTS AND DISCUSSION

The concept of self-efficacy, proposed by Bandura (1977, 1997), is a psychological factor that plays an important role in individual behavior and motivation. Self-efficacy refers to a person's belief that they are capable of performing certain actions to achieve desired results. [10]In the context of education, teacher self-efficacy is primarily related to their confidence in managing the learning process effectively, including in the use of technology. Based on Bandura's theory, self-efficacy influences how teachers think, act, and react to various learning situations. Teachers with high self-efficacy are more confident in facing challenges, more flexible in adopting new learning strategies, and more persistent in overcoming obstacles.

[10] A Putry, Puji Astuti, and Zulfa Sakhiyya, "The Manifestation of EFL Teachers' Self-Efficacy and TPACK with Their Teaching Performance," *English Education Journal* (2022)

Conversely, teachers with low self-efficacy tend to hesitate in taking initiative and are more susceptible to stress and mental fatigue [11].

In the context of technology integration, teacher self-efficacy is an important indicator that predicts how much teachers are willing and able to use technology in their teaching.[12] In his research on computer self-efficacy, he showed that individual beliefs about their ability to use technology greatly influence their behavior and attitudes towards the use of the technology. He [13]also stated that teachers with high self-efficacy are more likely to try new learning approaches, including the use of technology in the classroom. This is in line with research [14], which found that teachers with high self-efficacy are more proactive in integrating technology compared to teachers who doubt their abilities.

Furthermore, teacher self-efficacy in technology use is also influenced by several external factors, such as mastery experience, vicarious experience, verbal persuasion, and emotional states. Direct experience using technology in the classroom can increase teacher confidence, while observing colleagues successfully using technology can provide motivation. Positive reinforcement from mentors or supervisors also contributes to increasing teacher self-efficacy, while anxiety or discomfort in using technology can decrease their confidence.

Several previous studies have shown a direct relationship between teacher self-efficacy and the success of technology integration in learning. For example, [15]In his research, he found that English teachers with high self-efficacy were more confident in using learning software, digital media, and online platforms in their teaching. [16]shows that improving teacher self-efficacy through technology training can increase their participation in technology-based learning. These results underscore the importance of efforts to improve teacher self-efficacy as part of a professional development strategy in the digital education era.

TPACK Framework in Technology Integration

In addition to self-efficacy, the Technological Pedagogical Content Knowledge (TPACK) framework provides an important foundation for understanding how teachers can effectively integrate knowledge of content, pedagogy, and technology. The TPACK framework, developed by Mishra and Koehler, explains that technology integration in learning depends not only on teachers' technical skills in using digital devices but also on how they connect technology with content and pedagogical knowledge.

TPACK consists of seven main components: 1) Content Knowledge (CK) – A deep understanding of the subject or subject matter being taught. 2) Pedagogical Knowledge (PK) – Knowledge of learning principles, teaching strategies, and classroom management. 3) Technological Knowledge (TK) – Understanding of various types of technology and how to

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use them in learning. 4) Pedagogical Content Knowledge (PCK) – A combination of pedagogical and content knowledge, namely how to deliver subject matter effectively to students. 5) Technological Content Knowledge (TCK) – Understanding how technology can be used to support the understanding of specific subject matter. 6) Technological Pedagogical Knowledge (TPK) – Knowledge of how technology can be used to support learning strategies. 7) Technological Pedagogical Content Knowledge (TPACK) – A synthesis of CK, PK, and TK, namely the ability to integrate technology effectively in specific learning contexts.

According to Mishra and Koehler, the successful integration of technology into learning depends on teachers' ability to harmoniously combine the three core knowledge bases (CK, PK, TK). For example, in teaching English, teachers not only need to understand grammatical and literary structures but also need to know how to use technology such as instructional videos, interactive applications, or online discussion platforms to support language learning effectively.

Several studies have shown that the implementation of TPACK contributes to improving the quality of technology-based learning. For example, Lisna Yanti and Iskhak Said [17]found that teachers with a good understanding of TPACK are better able to design innovative and relevant learning activities to meet students' needs. Similarly, Lita Liviani Taopan [18]concluded in her research that developing TPACK through teacher training and coaching can improve their ability to effectively integrate technology into learning.

In addition, research by Agatha Lisa[19] shows that TPACK is not just the sum of CK, PK, and TK, but is a dynamic and contextual knowledge that develops along with teachers' experience in using technology in the classroom. Therefore, the development of TPACK requires a holistic approach, which does not only focus on technical training, but also on pedagogical reflection and in-depth exploration of content [20].

By considering these two theoretical frameworks, teacher self-efficacy and TPACK, this study attempts to link teachers' self-efficacy with their ability to effectively integrate technology in English teaching [21]. By understanding how these two factors influence each other, this study is expected to provide useful insights for teacher professional development and improving the quality of technology-based learning [22].

Research Findings

Based on a survey of 50 English teachers, teachers' self-efficacy in technology integration showed significant variation. The majority of teachers (around 65%) reported high confidence in using technology as a learning tool, particularly in the use of learning software, digital presentations, and online learning platforms. However, a small proportion of teachers (around 35%) still felt less confident in optimally integrating technology, particularly in terms of using technology to evaluate student learning outcomes and provide digital feedback.

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[19] Agatha Lisa et al., "A TPACK-in Practice Model for Enhancing EFL Students' Readiness to Teach with Ed-Tech Apps," *Int. J. Interact. Mob. Technol.* 15 (2021): 156,

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[21] J Nurkamto, Agustina Tyarakanita, and N Drajati, "The Indonesian EFL Teachers' TPACK Development in the Online Community of Practice," *Pedagogy : Journal of English Language Teaching* (2021),

[22] Nur Alifatun Nisa, "Investigating Efl Pre-Service Teachers' Perceptions f Tpack (Technological Pedagogical Content Knowledge) For Their Teaching," *Journal of the English Education Program (JEEP)* (2022),

One interesting finding from this survey is the positive relationship between teaching experience and teachers' self-efficacy in using technology. Teachers with more than ten years of teaching experience tend to have higher confidence in using technology compared to teachers with less than five years of experience. This may be explained by the fact that more experienced teachers have had more opportunities to participate in technology training and have adapted technology into their teaching over time.

Furthermore, the survey results also show that institutional support, such as technology training and access to digital tools, plays a significant role in enhancing teacher self-efficacy. Teachers working in schools with adequate technology facilities and ongoing professional development programs reported higher levels of confidence in using technology compared to teachers working in schools with limited technological resources.

Implementation of TPACK in English Teaching

The results of retrospective observations and interviews with three English teachers showed that the implementation of TPACK in their teaching varied, depending on their level of understanding of the integration of technology, content, and pedagogy. In general, all teachers demonstrated a basic understanding of TPACK, but the level of implementation varied.

The first teacher, known as Ari, demonstrated a relatively good implementation of TPACK. In his class, the teacher used digital animation to teach report text to his students. He combined content knowledge about the structure of report text with pedagogical knowledge about active learning strategies, as well as technological knowledge about the use of animation to make learning more visual and interactive. Observations showed that Ari's students appeared more interested and active in the learning, and they more easily understood the concepts of report text through the visual representation provided by animation.

The second teacher also demonstrated strong TPACK implementation, particularly in the use of web-based teaching materials to teach advertising. In his class, Bara utilized websites and advertising videos to provide concrete examples of how language is used in promotional contexts. He combined content knowledge about advertising structure with pedagogical knowledge about problem-based learning, as well as technological knowledge about using the internet as a learning resource. Observations showed that Bara's students were more engaged in discussions and were able to analyze advertisements effectively using the language concepts they had learned.

The third teacher demonstrated a more limited application of TPACK. Although she used instructional videos to teach the present tense, the application of technology in her classroom tended to be passive. Students simply watched the videos without any interaction or learning activities designed to reinforce their understanding. This suggests that while Dewi possessed adequate technological and content knowledge, she had not yet fully implemented the pedagogical principles of technology integration.

Overall, the observations indicate that effective implementation of TPACK requires a balanced combination of content knowledge, pedagogy, and technology. Teachers who successfully implement TPACK optimally are those who are able to design learning activities that utilize technology to support student understanding, not simply as an additional learning tool.

The Relationship between Teacher Self-Efficacy and TPACK Implementation

Data analysis shows a positive relationship between teacher self-efficacy and the implementation of TPACK in English teaching. Teachers with high self-efficacy tend to be more confident in using technology and more proactive in integrating it into their learning. They are also better able to effectively combine content knowledge, pedagogy, and technology, creating more meaningful learning experiences for students.

Conversely, teachers with low self-efficacy often face obstacles in implementing TPACK. They tend to be hesitant about using technology, worry about their inability to manage technology-based classrooms, and lack confidence in designing learning activities that utilize technology optimally. This suggests that teacher self-efficacy is a crucial factor influencing the successful integration of technology into learning.

This finding aligns with previous research showing that teacher self-efficacy plays a key role in determining how willing and able teachers are to use technology in their teaching. For example, research by Drajati [23]found that teachers with high self-efficacy were more confident in using learning software and digital media in their teaching.

Considering these findings, it can be concluded that teacher self-efficacy and TPACK implementation are closely related. Efforts to improve teacher self-efficacy in using technology can contribute to improving the quality of TPACK implementation in English language teaching. Therefore, it is important for educational institutions and curriculum developers to provide adequate support in the form of technology training, professional development, and access to adequate technology resources so that teachers can develop their self-efficacy and implement TPACK effectively in their learning.

Discussion

The results of this study provide important insights into how teacher self-efficacy and TPACK implementation are interrelated in the context of technology integration in English language teaching. One of the main findings of this study is that teachers' levels of self-efficacy have a significant influence on the success of technology integration. Teachers with high self-efficacy are more proactive in using technology, more confident in designing technology-based learning activities, and more able to effectively combine content knowledge, pedagogy, and technology. [2425]. On the other hand, teachers with low self-efficacy tend to be hesitant in using technology and less optimal in implementing TPACK in their teaching [26].

This finding aligns with previous research showing that self-efficacy is a psychological factor influencing teachers' behavior and motivation in adopting technology in learning. For example, Fatmayana Latif [27,] In his research on computer self-efficacy, he found that individuals' beliefs about their ability to use technology greatly influence their behavior and attitudes toward using that technology. This is also supported by research Surayya and M

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[26] Endang Setyaningsih, D Wahyuni, and Dewi Rochsantiningsih, "Mapping Indonesian EFL Teachers' Perception and Practice of Technology Integration," *International Journal of Education* (2020),

[27] Fatmayana Latif et al., "Implementation of Technological Pedagogical Content Knowledge (TPACK) in the Malaysian-Indonesian National School," *International Journal of Multicultural and Multireligious Understanding* (2024)

Asrobi [28], Nurul Shahhida Abu Bakar [29], which shows that teachers with high self-efficacy are more likely to try new learning approaches, including the use of technology in the classroom.

Furthermore, observations and interviews indicate that effective TPACK implementation requires a balanced combination of content knowledge, pedagogy, and technology. Teachers who successfully implement TPACK optimally are those who are able to design learning activities that utilize technology to support student understanding, not simply as an additional tool in learning. For example, teachers like Ari and Bara demonstrate good TPACK implementation by combining content knowledge about text structure and advertising with pedagogical knowledge about active learning strategies and technological knowledge about the use of animation and learning videos. These results are in line with research by Masrurin Lailiyah and B Cahyono [30], who found that teachers who have a good understanding of TPACK are better able to design learning activities that are innovative and relevant to students' needs [31].

However, the results of this study also indicate that some teachers still face challenges in implementing TPACK effectively. For example, it shows a more limited implementation of TPACK due to a lack of pedagogical integration in the use of technology. This suggests that the implementation of TPACK depends not only on teachers' technical understanding of technology use, but also on how they connect technology with learning strategies that support understanding [3233].

Recommendations for Professional Practice and Development

Based on the findings of this study, several recommendations can be made to support the improvement of teacher self-efficacy and the implementation of TPACK in English teaching. First, educational institutions and curriculum developers need to provide more intensive and ongoing technology training for teachers. This training should not only focus on the use of technological devices, but also on how technology can be used to effectively support English learning.

Second, teacher professional development programs should integrate TPACK concepts as part of technology training. This can be done through workshops, mentoring, and classroom observations designed to help teachers understand how to integrate content knowledge, pedagogy, and technology in their teaching. These programs can also include case studies and hands-on practice in designing technology-based learning activities.

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[28] S Surayya and M Asrobi, "Tracing Technological Pedagogical Content Knowledge (TPACK) on Practical EFL Teachers in Writing Context" 4 (2020): 177–190,

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Third, it is crucial for schools and educational institutions to provide adequate infrastructure and technological resources. Access to digital devices, a stable internet connection, and user-friendly online learning platforms can help teachers develop their self-efficacy in using technology. Furthermore, support from principals and colleagues can also contribute to creating a learning environment that supports technology use.

Fourth, further research is needed to explore other factors that may influence teacher self-efficacy and the implementation of TPACK in English teaching. For example, research could focus on the influence of school organizational culture, educational policies, and teachers' professional experiences on building their confidence in using technology. Taking these findings and recommendations into account, it is hoped that this research can make a meaningful contribution to improving the quality of English education in the digital era.

CONCLUSION

This study aims to explore how English teachers' self-efficacy influences the integration of technology into their teaching and how the TPACK framework is applied in learning practices. Based on the results of surveys, observations, and retrospective interviews with 50 English teachers, this study found that teachers' self-efficacy levels have a significant influence on the success of technology integration in learning. Teachers with high self-efficacy are more confident in using technology, more proactive in designing technology-based learning activities, and better able to effectively combine content knowledge, pedagogy, and technology. Furthermore, the results of this study indicate that effective TPACK implementation requires a balanced combination of content knowledge, pedagogy, and technology. Teachers who successfully implement TPACK optimally are those who are able to design learning activities that utilize technology to support student understanding, not simply as an additional tool in learning. However, some teachers still face challenges in implementing TPACK effectively, especially in terms of pedagogical integration and the use of technology to support active learning strategies.

The findings of this study provide important implications for teacher professional development, technology training, and education policymaking. Efforts to improve teachers' self-efficacy in using technology can contribute to improving the quality of TPACK implementation in English language teaching. Therefore, it is crucial for educational institutions and curriculum developers to provide adequate support in the form of technology training, professional development, and access to adequate technology resources so that teachers can develop their self-efficacy and effectively implement TPACK in their learning.

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