

THE MASTERY OF TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE (TPACK) ON PRE-SERVICE ENGLISH TEACHERS

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ABSTRACT

The research has objective to analyze the ability of pre-service English teachers in TPACK. TPACK is a framework that explains the integration of technology in teaching by emphasizing the interaction between three main knowledges, namely Technological Knowledge (TK), Pedagogical Knowledge (PK), and Content Knowledge (CK). This study uses qualitative research. The respondents in this study were pre-service English teacher students at FKIP Universitas HKBP Nommensen. Data were obtained through questionnaires that given to respondents by using Likert scales. Then, data was analyzed by using Miles and Huberman taht consist of three stages, namely, data reduction, displaying data, and drawing conclusion (verification) . The results of the study showed that the ability of prospective teachers in TPACK was categorized as good with an average 75,1.

Keywords: TPACK, Pre-Servive English Teacher.

ABSTRAK

Penelitian ini bertujuan untuk menganalisis kemampuan calon guru bahasa Inggris dalam TPACK. TPACK merupakan suatu kerangka kerja yang menjelaskan tentang integrasi teknologi dalam pengajaran dengan menekankan interaksi antara tiga pengetahuan utama, yaitu Pengetahuan Teknologi, Pengetahuan Pedagogis, dan Pengetahuan Konten. Penelitian ini menggunakan penelitian kualitatif. Mahasiswa calon guru bahasa Inggris menjadi subjek (responden) penelitian. Data diperoleh melalui penyebaran kuesioner kepada responden dengan menggunakan skala likert. Kemudian, konsep analisis data penelitian menggunakan Miles dan Huberman yang terdiri dari tiga tahap, yaitu pereduksian data, menyajikan data, dan menarik kesimpulan (verifikasi). Hasil analisis penelitian menggambarkan bahwa kemampuan calon guru dalam TPACK dikategorikan baik dengan rata-rata 75,1.

Kata Kunci: TPACK, Calon Guru Bahasa Inggris.

1. INTRODUCTION

The incorporation of technology in education has been a fundamental aspect of teaching in this era, transforming how educators approach instructional delivery. With the rapid advancement of educational technologies, it is imperative

that teachers possess the necessary skills to effectively incorporate technology into their pedagogical methods. In this context, Technological Pedagogical Content Knowledge (TPACK) has emerged as a critical framework that highlights the interplay between

technology, pedagogy, and content knowledge. The TPACK model, introduced by Mishra and Koehler in 2006 (Koehler, M. J., & Mishra, 2008; Koehler, M. J., Shin, T. S., & Mishra, 2017). It offers an all-encompassing viewpoint on the diverse information needed for 21st-century education.

Pre-service teachers, particularly those specializing in English language education, face unique challenges in mastering TPACK. English teaching involves not only linguistic and literary content but also diverse pedagogical strategies that address the varied needs of students. When combined with technology, this dynamic becomes even more complex (Brown, 2007; Kessler, 2018; Richards, J. C., & Rodgers, 2014). For instance, English teachers must be adept at using digital tools for grammar exercises, interactive platforms for language practice, and multimedia resources to enhance students' cultural understanding. These requirements underscore the importance of equipping pre-service English teachers with robust TPACK skills during their training.

However, research indicates that many pre-service teachers struggle to incorporate technology meaningfully into their teaching practices (Ertmer, 2005; Hew, K. F., & Brush, 2007). Studies have shown that while they may possess basic technological skills, they often lack the ability to align these skills with pedagogical and content knowledge. This gap is particularly evident in English language education, where technological tools are often underutilized or misaligned with instructional objectives. Such shortcomings can lead to ineffective teaching and diminished student engagement, ultimately compromising the quality of English language education.

The significance of TPACK mastery for pre-service English teachers cannot be overstated. In an era where digital literacy is a prerequisite for

success, English language teachers must not only be competent in traditional teaching methods but also be proficient in leveraging technology to improve the acquisition of language. For instance, resources like virtual reality and applications for language learning for cultural immersion, and online collaborative writing platforms offer immense potential to transform the English language classroom. However, the effective use of these tools requires a deep understanding of TPACK framework.

Despite the growing recognition of TPACK's importance, there remains a lack of comprehensive research on its mastery among pre-service English teachers. Existing studies often focus on in-service teachers or explore the general application of TPACK without delving into the specific challenges faced by English language educators. Furthermore, the influence of factors such as teacher education programs, institutional support, and individual attitudes toward technology on TPACK mastery is not fully understood. In order to develop focused interventions that enhance TPACK competencies among pre-service teachers.

A role of teacher education programs in fostering TPACK mastery is particularly noteworthy. Effective training programs should provide pre-service teachers with opportunities to integrate technology into their teaching practices through hands-on experiences, collaborative projects, and reflective practices. Additionally, the curriculum should emphasize the interconnectedness of technological, pedagogical, and content knowledge, encouraging pre-service teachers to adopt a holistic approach to teaching.

This study has objective to examine the mastery of TPACK among pre-service English teachers, focusing on their ability to integrate technology into English language instruction. By

exploring their strengths and weaknesses in TPACK competencies, the study seeks to identify key factors influencing their mastery and provide recommendations for enhancing teacher education programs. The findings of this research will contribute to the growing body of knowledge on TPACK and inform strategies for preparing pre-service English teachers for the challenges of 21st-century education.

Thus, one of the most important areas of research that tackles the changing needs of contemporary education is the knowledge of TPACK among pre-service English teachers. Teacher education programs can significantly contribute to raising the standard of English language instruction by giving aspiring teachers the tools they need to combine pedagogy, technology, and subject-matter expertise. This study aims to clarify this significant matter, providing information that will be useful to academics, educators, and policymakers.

2. RESEARCH METHOD

This research used qualitative research. The contextual nature of qualitative research places the observer in the real world. The world is made visible through a series of tangible, interpretative actions. The world is changed by these actions. They transform the world into a collection of representations, such as field notes, interviews, dialogues, images, recordings, and self-memoranda (Denzin, N. K., & Lincoln, 2018). The subject of this research was pre-service English teacher of Faculty of Teacher Training and Education. The data was gotten from questionnaires and observation that given to the pre-service English teacher. So, all the answers were analyzed and calculated to get the conclusion. The choices in the questionnaires consist of five scales Likert.

The data of observation was analyzed by using the Interactive Model proposed by Miles, Huberman, and Saldana (Miles, M. B., Huberman, M. a,

& Saldana, 2014). The analysis involved three steps: 1) data condensation. This is the process of selecting, focusing, simplifying, abstracting, and transforming the data that appears in the original data into more understandable information. 2) data display. This method presents the data in a format that allows the researcher to see existing patterns and relationships, usually done using a matrix or network. 3) and drawing conclusion (verification). This involves interpreting the analyzed data to draw verifiable conclusions that support or challenge the research hypothesis.

3. RESULT AND DISCUSSION

3.1 Technological Knowledge (TK) Analysis

Technological Knowledge is understanding skills related to various technological tools and media is used in an instruction process. This includes an understanding of hardware and software, as well as relevant technological applications for education (Arini & Wiguna, 2021; Koehler, M. J., & Mishra, 2008; Koehler, M. J., Shin, T. S., & Mishra, 2017; Lestari & Rahayu, 2023). The result of data analysis of the pre-service English teachers' technological knowledge can be found below.

Table 1 The Technological Knowledge (TK) Analysis Result

No.	Aspects	TK	
		Value	Category
1.	Able to use PPT	77,8	Good
2.	Able to operate hardware such as a projector, laptop, or tablet.	74,4	Good
3.	Knowing to use online learning platforms (such as Moodle).	72,2	Good
4.	Able to learn new technology applications independently	74,4	Good
5.	Able to use online tools to create learning content, such as Canva or Prezi.	74,4	Good
6.	Able to utilize social media to support learning.	72,2	Good

Average	74,2	Good
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Table 1 shows that all respondents have a good ability in technology. They were on the good category with an average score of 74,2. By mastering technology, people can do communication by cyber media and it can make teaching learning process more fun. So, technology is necessary for communication and education (Castells, 2010; Zhao, 2003)

3.2 The Analysis Results of Pedagogical Knowledge (PK)

Pedagogical Knowledge (PK) includes teaching theories and practices, including an understanding of various learning methods, instructional strategies, and how to manage the classroom. This knowledge is essential for designing effective and student-centered learning experiences (Arini & Wiguna, 2021; Koehler, M. J., & Mishra, 2008; Koehler, M. J., Shin, T. S., & Mishra, 2017; Lestari & Rahayu, 2023). The result of data analysis regarding to Pedagogical Knowledge can be shown below.

Table 2 The Pedagogical Knowledge (PK) Analysis Results

No.	Aspects	PK	
		Values	Category
1	Understanding in use discussion methods to increase student engagement.	73,33	Good
2	Knowing to design effective lesson plans.	75,56	Good
3	Able to get reflective action to enhance the quality of instruction	73,33	Good
4	Able to choose appropriate teaching methods for students with different learning styles.	75,56	Good
5	Able to provide constructive feedback to students.	75,56	Good
6	to build student motivation in learning English.	75,56	Good
Average		73,3	Good

Table 2 shows that the respondents' ability has a good category in pedagogical knowledge the average value was 73,3. It means that the respondent have a good ability to plan effective learning and use

teaching method. This is in line with previous findings which state that a teacher who has good pedagogical knowledge will create effective and enjoyable learning (Darling-Hammond, 2006; Shulman, 1986).

3.3 The Content Knowledge Analysis Results

Content Knowledge is a deep comprehending of the material or content being taught (Arini & Wiguna, 2021; Koehler, M. J., & Mishra, 2008; Koehler, M. J., Shin, T. S., & Mishra, 2017; Lestari & Rahayu, 2023). The result of data analysis toward respondents' Content Knowledge can be described in table below.

Table 3 The Content Knowledge (CK) Analysis Results

No.	Aspects	CK	
		Value	Category
1.	Having a deep understanding of English grammar.	80	Good
2.	Able to teach speaking skills with effective methods.	73,3	Good
3.	Able to understand and teach listening skills in English.	72,2	Good
4.	Able to communicate new words in a way that students can easily comprehend.	72,2	Good
5.	Mastering the techniques of teaching reading skills in English.	74,4	Good
6.	Able to understand and teach writing skills in English.	72,2	Good
Average		74,1	Good

Table 3 shows that the pre-service English teachers' ability has a good category in content knowledge with an average value of 74,1. Among five aspects, the first aspect has a higher percentage. This means that content knowledge is measured from the knowledge of pre-service teachers in understanding English grammar.

3.4 The Technological Pedagogical Knowledge (TPK) Analysis Results

Technological Pedagogical Knowledge (TPK) refers to the

understanding of how technology could be conducted effectively in learning process (Arini & Wiguna, 2021; Koehler, M. J., & Mishra, 2008; Koehler, M. J., Shin, T. S., & Mishra, 2017; Lestari & Rahayu, 2023). The result of data analysis toward respondents' Technological Pedagogical Knowledge can be described in table below.

Table 4 Technological Pedagogical Knowledge (TPK) Analysis Result

No.	Aspects	TPK	
		Value	Category
1.	Able to know use technology to facilitate student-centered learning.	75,6	Good
2.	Able to select the most appropriate technology for a particular teaching strategy	78,9	Good
3.	Able to know and use technology to support project-based learning	76,7	Good
4.	Able to teach students to use technology responsibly in their learning.	75,6	Good
5.	use technology to accommodate the learning needs of students with varying abilities.	75,6	Good
Average		76,5	Good

Table 4 shows that the pre-service English teachers' ability has a good category in Technological Pedagogical Knowledge (TPK) with an average value of 76,5. In table 4 above, it can be seen that the highest aspect is in the second aspect with a value of 78.9. It shows that the respondents are able to use technology with teaching strategy. Educators is able to use technology, of course they are able to create dynamic interaction with students and help to create a more inclusive and effective learning experience (Higgins, S., Xiao, Z., & Katsipataki, 2012; Voogt, J., & Roblin, 2012).

3.5 The Pedagogical Content Knowledge (PCK) Analysis Results

Pedagogical Content Knowledge (PCK) is knowledge related to how to teach certain material, including

strategies for explaining difficult concepts, how to adapt teaching to students' needs, and appropriate evaluation methods. It is a combination of pedagogical and content knowledge (Arini & Wiguna, 2021; Koehler, M. J., & Mishra, 2008; Koehler, M. J., Shin, T. S., & Mishra, 2017; Lestari & Rahayu, 2023). The result of data analysis toward respondents' Technological Pedagogical Knowledge can be described in table below.

Table 5 The Pedagogical Content Knowledge (PCK) Analysis Results

No.	Aspects	PCK	
		Value	Category
1.	Knowing the best teaching methods to teach English grammar.	80	Good
2.	Able to explain English materials in a way that is appropriate to the students' ability level.	78,9	Good
3.	Able to integrate culturally-based learning into English materials	72,2	Good
4.	Able to develop assessments that are relevant to English language skills.	75,6	Good
5.	Able to design activities that enhance students' communication skills.	76,7	Good
Average		76,7	Good

Table 5 shows that the respondents have a good category in Pedagogical Content Knowledge with an average value of 76,7. In table 5 above, it can be seen that the highest aspects are in the first aspect. This shows the respondents are able to decide a method in teaching grammar.

3.6 The Technological Content Knowledge (TCK) Analysis Results

Technological Content Knowledge (TCK) points to the understanding of how technology could support and enrich in delivering content. For example, using computer simulations to teach physics concepts or involving multimedia in History lessons (Arini & Wiguna, 2021; Koehler, M. J., & Mishra, 2008; Koehler,

M. J., Shin, T. S., & Mishra, 2017; Lestari & Rahayu, 2023). The result of data analysis toward respondents' Technological Content Knowledge can be described in table below.

Table 6 The Technological Content Knowledge (TCK) Analysis Results

No.	Aspects	TPK Value	Category
1	Knowing and able to use software to teach English grammar.	78,9	Good
2	Able to use technology-based applications to practice students' speaking skills.	76,7	Good
3	Able to use technology to help students understand new vocabulary.	75,6	Good
4	Able to improve students' understanding through the visual aids used	75,6	Good
5	Able to use instructional videos to teach in the classroom.	76,7	Good
Average		76,7	Good

Table 6 shows that the pre-service English teachers' ability has a good category in Technological Content Knowledge with an average value of 76,7. In table 6 above, it can be seen that the highest aspect is in the first aspect. This shows that the Technological Content Knowledge's ability is measured from pre-service teachers' knowledge in using software to teach English grammar. This is line with the previous researchers that said that the use software in grammar makes students more involved dan can strengthen their understanding in grammar (Boulton, 2010).

3.7 The Analysis Results of Technological Pedagogical and Content Knowledge (TPACK)

The three categories of knowledge mentioned above—technology, pedagogy, and content—combine to form Technological Pedagogical and Content Knowledge (TPACK). It explains how educators can successfully incorporate technology into their lesson plans and

lesson content to give students a comprehensive and engaging learning experience (Koehler, M. J., & Mishra, 2008). The table below describes the findings of the data analysis on the Technological Pedagogical and Content Knowledge (TPACK) of the respondents.

Table 7 The Analysis Results of Technological Pedagogical and Content Knowledge (TPACK)

No.	Aspects	TPACK Value	Category
1.	Able to design effective English learning by integrating technology	75,6	Good
2.	Knowing and able to combine technology, teaching strategies, and English teaching materials.	76,7	Good
3.	Able to use technology to create meaningful English learning experiences	72,2	Good
4.	Be confident in integrating technology into English teaching.	75,6	Good
5.	Able to use technology to overcome students' difficulties in understanding English materials.	75,6	Good
Average		75,1	Good

Table 7 shows that respondents have a good category in Technological Pedagogical and Content Knowledge (TPACK) with an average value of 75,1. The aspect that has the highest percentage or value is the 2th aspect. It means that respondents knowing and able to combine technology, teaching strategies, and English teaching material. The use digital tools with effective strategy and materials make inclusive learning (Richards, J. C., & Rodgers, 2014)

4. CONCLUSION

The analysis results states that the pre-service teachers have a good category in TPACK. They are able to integrate content, pedagogic and technology in teaching.

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