



The Implementation of TPACK and Its Impact on EFL Students' Achievement

A Systematic Literature Review

¹Siti Aminatuz Zahro, ¹Ive Emaliana*, ²Khairil Azwar Razali, ¹Frida Unsiyah, ¹Ulfah Sutiarti, ³Wan Nurul Elia Haslee Sharil, ²Rafidah Sahar

Corresponding Author: *ive@ub.ac.id

¹ Universitas Brawijaya, Malang, Indonesia

² International Islamic University Malaysia, Pagoh, Malaysia

³ Universiti Teknologi MARA (UiTM), Malaysia

ARTICLE INFO

Article history

Received 1 December 2025

Revised 17 June 2026

Accepted 21 June 2026

Keywords

EFL Student Achievement

Language Pedagogy

Literature Review

Technology Integration

TPACK Framework

ABSTRACT

The Systematic Literature Review (SLR) study examines the implementation of TPACK in an EFL context and its impact on EFL students' achievement more broadly in a global context. This SLR study followed the PRISMA and PICOC protocol standards to achieve the research objectives. The data collection stage used the Scopus journal database to obtain credible literature by using Publish or Perish (PoP) software to collect the literature sources. Thirty-two articles from 2016-2025 were obtained, which were then screened and reviewed using Covidence software for relevance to the research topic. The results show that TPACK contributes to developing students' English language skills, a factor that has not been extensively studied and understood by previous research. Therefore, it can be concluded that this study aims to systematically fill the gap in previous research by integrating TPACK into student learning outcomes and includes recommendations for future research to further explore the implementation of TPACK using a larger database and several stakeholder perspectives that were not yet achieved by this study.

This is an open-access article under the [CC-BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.



Introduction

The use of technology in learning activities has grown in recent years. This makes technology an integral part of human life, including in education [1]. Along with this increase, there are several digital devices; technology integration has become a key component for creating effective learning, especially in the EFL context. This creates a paradigm shift where traditional learning is often unable to meet the needs of more inclusive learning and maintain student engagement [2]. Thus, this requires teachers to have good competencies in integrating technology in their pedagogy. One framework that represents the integration of technology in learning is Technological Pedagogical Content Knowledge (TPACK). This framework was developed by Koehler & Mishra [3]. The TPACK framework can help teachers to create more adaptive, engaging, and effective EFL learning based on technology, pedagogy, and content in an integrated manner.

This study shows that the implementation of TPACK in EFL learning not only supports innovative learning but also improves teachers' ability to adapt teaching to students' needs. This is in line with previous research that confirmed that technology integration improves EFL teachers' TPACK competencies [4]. Furthermore, TPACK can also provide benefits for students, such as positive student perceptions of technology-based learning [5], student engagement, and strengthening 21st-century skills [6]

Although extensive research on TPACK in EFL has been conducted, limitations remain that require further study. A previous study revealed that EFL teachers who implement TPACK in their lessons are able to increase student participation [7]. However, this study did not highlight the direct impact of TPACK implementation on EFL students' learning achievement in the classroom and only focused on Indonesia. Furthermore, the use of technology in learning is still limited to a few applications, while other technologies have not been widely and optimally implemented [8]. This demonstrates a gap in the previous literature that needs further exploration, particularly from a global perspective and its impact on EFL students.

Therefore, this study aims to explore the implementation of TPACK in EFL contexts across various countries through a Systematic Literature Review (SLR) method. To achieve this objective, this study has several research questions. (RQ1) What does empirical research reveal about the implementation of TPACK in EFL classrooms? This question aims to explore how TPACK is implemented in learning. (RQ2) To what extent does EFL teachers' TPACK implementation affect students' English achievement in existing empirical studies? This question focuses on evidence of the influence of TPACK implementation in learning. (RQ3) What are the highest-level aspects of EFL teachers' TPACK in EFL learning based on existing empirical studies? This question aims to find out the most developed TPACK domains.

Material and Methods

This study employed the Systematic Literature Review (SLR) method and PRISMA as its framework. A Systematic Literature Review (SLR) is a research method that examines previous research to address the research problem being discussed. This method utilizes a structured/systematic and objective approach to data collection and processing. SLR is a comprehensive and systematic research method that aims to accurately and objectively summarize previous literature relevant to the research topic [9]. SLR research involves three main stages: planning, conducting, and reporting [10].

A. Planning

The planning stage involves several steps. The first step is identifying the need for a systematic review. This stage involves developing research questions tailored to the research objectives.

Table 1. PICOC formula

Population	EFL teachers and EFL students
Intervention	The implementation of TPACK by EFL teachers in EFL
Comparison	Across different countries
Outcomes	Implementation of TPACK in EFL The highest aspect of EFL teachers' TPACK The impact of TPACK on EFL students
Context	EFL classroom based on existing empirical studies.

Table 1 shows an outline of the PICOC framework (Population, Intervention, Comparison, Outcomes, Context) for formulating research questions. This description includes the population (EFL teachers and students), the implementation of TPACK, and the classroom context. It aims to ensure that the research focus remains maintained during the systematic review process [11].

Table 2. Inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
Time period	2016 – 2025	Any study outside these time
Journal article	Scopus journal	Any study outside of Scopus
Language of article	English language	Non-English
Countries	Across different countries	-
Focus participants	EFL teachers and EFL students	Non-EFL students and teachers
Source of article data	Primary	Secondary
Study focus	Implementation of TPACK and the impact in the EFL context	Any studies outside of these outcomes

Most importantly, PRISMA not only proposed specific questions to be answered but also enabled researchers to retrieve documents from a large database based on accurate inclusion and exclusion criteria [12]. Thus, Table 2 presents the inclusion and exclusion criteria for

selecting literature. This aims to serve as a screening protocol to ensure that only relevant and credible primary articles are analyzed in this study.

B. Conducting

After formulating the research question and the literature selection protocol, the next stage is conducting the research. This stage involves analyzing literature relevant to the topic using the protocol created in the planning stage. This study used Scopus journals as a source for selecting literature. This is because the journal has a good reputation and credibility. In selecting the literature, the researcher used software assistance in the form of Publish or Perish (PoP), which is integrated with Scopus journals. The selection of articles in Scopus journals using PoP included articles published between 2016 and 2025. Several keywords were used to facilitate the literature search relevant to the research criteria and topic.

Table 3. The result of mount article in Scopus journals from 2016-2025

Keywords	Number of articles
TPACK implement* AND EFL	319
TPACK integrating AND EFL teachers	238
EFL teachers level of TPACK	583
TPACK influence* AND EFL students	183
TPACK AND EFL students achievements	336
Total	1.659

Based on Table 3, the keywords used in PoP (Publish or Perish) and searching for articles in Scopus journals, 1,659 articles were found. However, the search results for each keyword still had the potential for duplicate titles. Therefore, further steps were needed to eliminate duplicate articles and advance to the advanced screening stage. The article screening process was assisted by Covidence software based on the established PRISMA protocol. This is intended to help readers understand the initial scale of data searching before the PRISMA screening stage.

In the initial stage of the article search, 1,659 articles were found with each keyword in Table 3. These articles still have the potential to contain duplicate results with the same title. Therefore, the Covidence software helped eliminate articles with the same title from the search process through each keyword. 1,238 duplicate articles were eliminated, resulting in a total of 421 articles to be screened. The resulting articles were screened based on the title, abstract, content, objectives, and results, resulting in 32 articles that were in accordance with the PRISMA framework and the research problem formulation.

After obtaining the final results of 32 articles relevant to the research protocol and topic, the process continued to the quality assessment stage. This stage aims to assess the quality of the selected articles to maintain focus on the research problem formulation.

The quality assessment indicators used are: (1) Relevance of the topic, (2) Clarity of the research method, (3) Clarity of the research objectives, (4) Clarity of the data analysis, (5) Quality of the research sources. The results of the quality assessment showed high quality in each indicator. So, the selected articles continued to the next stage, namely data extraction. The data extraction stage aims to classify and systematically determine the research results of each selected article. After knowing the findings of each article, the researcher synthesized the research results from the 32 selected articles.

Results and Discussions

A. The implementation of TPACK in the EFL context

Based on 32 relevant previous articles from various countries published between 2016 and 2025. The findings of the selected articles show the implementation of TPACK in the EFL context in 11 countries (Nepal, Malaysia, China, Bangladesh, Indonesia, Turkey, South Africa, Iraq, Jordan, Japan, and Egypt) with a contextual and adaptive approach.

Table 4. List of *articles* about TPACK implementation for EFL teachers

No	Findings	Country
1.	Telegram Bot application integration improves teachers' TPACK in English teaching [13].	Indonesia
2.	Pre-service teachers showed an increase in their ability to integrate TPACK into their teaching practices [14].	Indonesia
3.	TPACK integration supports flexibility and improves teachers' digital literacy [15].	South Africa
4.	The TPACK model uses AI integration to improve teachers' teaching skills [16].	China
5.	AI integration through TPACK improves teacher professionalism and teacher pedagogy [17].	Nepal
6.	TPACK integration can help teachers to built flexibility teaching and learning activities [18].	South Africa
7.	GenAI from the TPACK framework supports teachers' professional growth [19].	Nepal
8.	TPACK with technology integration helps teachers promote remote learning in limited learning resources [20].	South Africa
9.	The TPACK integration helps teachers to promote blended and project-based learning understanding [21].	Indonesia
10.	ChatGPT based on the TPACK framework can improve teaching skills [22].	Egypt
11.	TPACK can improve teachers' MindManager software and mind mapping [23].	China
12.	TPA/CK integration can help teachers to improve teaching efficacy [24].	China
13.	High TPACK levels will contribute to teachers' improved self-efficacy [25].	Turkey
14.	TPACK integration can increase teachers' positive attitudes toward online teaching [26].	Iraq
15.	TPACK integration can help teachers propose interactive and effective teaching [27].	China

Table 4 classifies the positive impacts of TPACK on various skills of students and teachers. Students can experience positive impacts such as speaking, writing, and digital literacy. Furthermore, TPACK implementation in EFL helps teachers design interactive and student-centered learning through the integration of technology from various applications. Empirical

research reveals that TPACK implementation in EFL can develop teaching methods that are contextual, adaptive, interactive, and relevant to 21st-century learning.

B. The impact of TPACK implementation for EFL students' achievement

In addition to providing implications for teachers, TPACK implementation also contributes to the achievement of EFL students. The integration of simple technologies such as YouTube, PowerPoint, and WhatsApp successfully increased student motivation and participation in EFL learning. However, empirical research suggests that these results are not absolute. This is because the implementation of TPACK's effectiveness is situational and depends on teacher and student readiness, challenges, and adequate facilities.

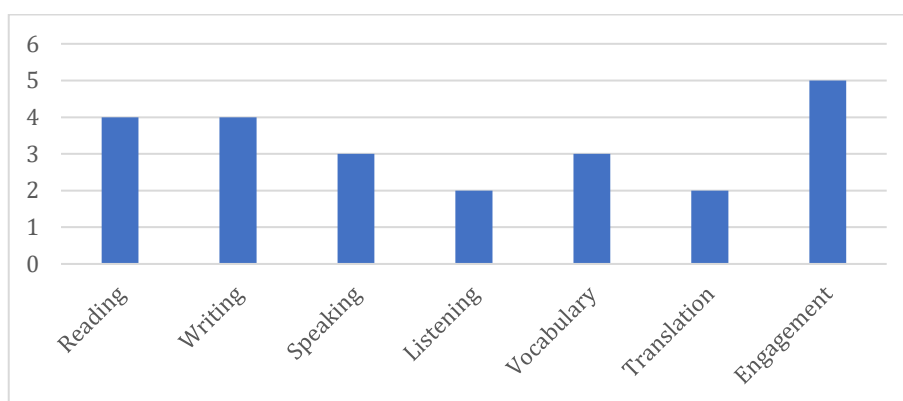


Fig. 1. Student's skills improved through TPACK implementation

Fig. 1 presents information on students' skills that improve with TPACK integration. The visualization shows that student engagement can increase if TPACK is implemented in the classroom. However, the diagram also indicates that the effectiveness of TPACK does not only impact one aspect but also contributes to several aspects, namely speaking, writing, reading, listening, vocabulary, and translation.

Table 5. List of articles about the impact of TPACK implementation on EFL students' achievement

No	Findings	Country
1.	VoiceThread integration improves students' speaking skills through the TPACK framework [28].	Japan
2.	Integration of TPACK-based teaching improves listening and speaking skills [29].	China
3.	Integration of Ed Tech applications through TPACK increases student understanding and engagement [30].	Bangladesh
4.	TPACK integration improves students' writing skills in English writing [31].	Indonesia
5.	TPACK integration improves students' reading skills [32].	Jordan
6.	Based on the TPACK framework can improve students' engagement and writing skills [33].	Indonesia
7.	Digital storytelling from TPACK integration can increase students' digital literacy [34].	Indonesia
8.	TPACK integration can improve students' pronunciation and collaboration through the application of intelligent voice software apps [35].	China

Table 5 shows that the implementation of TPACK, based on previous research, reported improvements in several EFL students' skills. As seen in the table and diagram, writing, listening, reading, speaking, pronunciation, digital literacy, and other skills have not been comprehensively examined by previous research. This indicates that the findings of this SLR study reveal the impact of TPACK on EFL students in greater detail and with a global scope.

C. The highest TPACK aspect from EFL teachers

In addition, research from selected articles also reports several aspects of TPACK that are predominantly mastered by teachers.

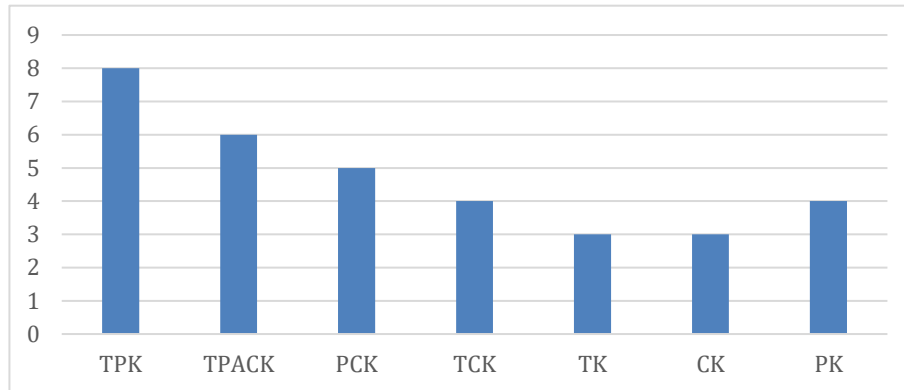


Fig. 2. The aspect of TPACK EFL teachers' level

Fig. 2 summarizes the level of TPACK domain mastery among EFL teachers in various regions. The highest aspects are Technological Pedagogical Knowledge (TPK) and TPACK as a whole. High TPK is reflected in teachers' ability to integrate technology into EFL learning. Teachers have been shown to be able to implement project-based learning, flipped classrooms, and even use AI in learning. It can be concluded that the implementation of TPACK in an EFL context has a positive impact. This framework is not only a conceptual framework but also an effective strategy capable of developing EFL learning.

Table 6. List of articles about the TPACK level of EFL teachers

No	Findings	Country
1.	Shows high levels of PCK aspects and low levels of TK aspects [36].	Indonesia
2.	Shows good overall understanding of TPACK but low in the technology skills aspect [37].	Malaysia
3.	Many pre-service EFL teachers have not yet mastered self-confidence and technological skills [38].	Indonesia
4.	Senior teachers had lower TPACK levels due to fewer training opportunities [39].	China
5.	Teachers had high subject knowledge but low integration ability [40]	China
6.	Digital literacy from TPACK integration was high, but teachers couldn't implement it in the classroom [41].	Indonesia
7.	Turkish teachers had high TPACK levels but no teaching experience [42].	Turkey
8.	High TPACK levels were positively correlated with good English proficiency [43].	Indonesia
9.	EFL teachers who had high experience also had high TPACK levels [44].	China

The overall findings of the SLR research explain the implementation of TPACK and its impact on EFL students' learning outcomes comprehensively with a broad global scope. These findings certainly differ from previous studies that only examined the impact of TPACK and focused on improving the competence of EFL teachers but paid less attention to the impact on EFL students' achievement [34]. This study only highlighted the impact of TPACK, which helps teachers to design learning without highlighting the direct impact of TPACK on EFL student learning outcomes. This Systematic Literature Review (SLR) provides a broader examination of the impact of TPACK on students, a topic that has not been explored in depth by previous research. These findings also report on several aspects of TPACK mastery by EFL teachers in various countries that have also not been explored extensively by previous research.

Conclusion

This study examines the implementation of TPACK in EFL and its impact on EFL students using a Systematic Literature Review (SLR). Data collection using Publish or Perish (PoP) software integrated with Scopus Journal resulted in 421 relevant articles from 2016-2025, addressing the research problem formulation. 32 articles were selected through a screening process using the PRISMA protocol. This study concludes that the implementation of TPACK in the EFL context can not only be used as a theoretical framework but can also serve as a strategy to transform learning into a more interactive and student-centered experience. The findings from the reviewed articles show that integrating TPACK in learning significantly enhances students' skills such as writing, listening, reading, speaking, as well as strengthening digital literacy. Moreover, TPACK also provides positive contributions to teachers, such as improving teaching skills.

However, this study may have shortcomings and limitations. There is a limitation that it only collected data from Scopus journals, which may account for the absence of articles from the United States or Europe in this specific review. This limitation of geography suggests that while TPACK is extensively researched in Asian and Middle Eastern EFL contexts, publications indexed in Scopus from Western regions during the 2016-2025 period might focus on different frameworks. This phenomenon shows a degradation of attention on TPACK in certain regions.

Therefore, for researchers in developed countries, the focus of TPACK research may have shifted towards more advanced technological integration in the global world, such as Artificial Intelligence (AI) or more dynamic digital frameworks. However, in developing countries, particularly in the EFL context, TPACK can still serve as a crucial diagnostic instrument to bridge pedagogical and technological gaps. This actually reflects a theoretical evolution where TPACK has already been assimilated into teachers' knowledge and thus is not explored extensively in the current literature. Instead, this research also only analyzes the implementation of TPACK from students' and teachers' perspectives.

Based on the findings and limitations in this research, there are several recommendations for future studies. First, due to the limited literature focused on certain regions, such as excluding the United States and Europe, subsequent research is expected to expand data collection to other sources like Web of Science (WoS), ERIC, or PsycINFO. This can also be an effort to verify whether TPACK has indeed experienced a decline in attention in Western regions. Second, more in-depth longitudinal studies are needed to understand the evolution of TPACK with the latest technologies such as Artificial Intelligence (AI). This is important to see whether TPACK is still adequate or requires theoretical reconstruction to remain relevant in the current era. Finally, future researchers can conduct a broader study on TPACK integration from various perspectives, such as those of policymakers and educational institutions, to gain a broader perspective. Thus, future research is expected to not only interpret the theoretical understanding of TPACK but also provide tangible contributions to the implementation of TPACK in EFL learning.

Acknowledgement

This research was supported by Universitas Brawijaya through the Hibah Doktor Lektor Kepala (Grant No. 02011.2/UN10.F1201/B/PT/2025)

Conflict of Interest

The author declared that there is no conflict of interest.

References

- [1] R. Rintaningrum, "Technology integration in English language teaching and learning: Benefits and challenges," *Cogent Education*, vol. 10, no. 1, 2023, doi: 10.1080/2331186X.2022.2164690.
- [2] C.-W. Chien, "Taiwanese EFL undergraduates' self-regulated learning with and without technology," *Innovation in Language Learning and Teaching*, vol. 13, no. 1, pp. 1–16, Jan. 2019, doi: 10.1080/17501229.2016.1264076.
- [3] M. J. Koehler, P. Mishra, and W. Cain, "What is Technological Pedagogical Content Knowledge (TPACK)?," *Journal of Education*, vol. 193, no. 3, pp. 13–19, Oct. 2013, doi: 10.1177/002205741319300303.
- [4] H. Zulianti, H. Hastuti, E. Nurchurifiani, T. Hastomo, A. Maximilian, and G. D. Ajeng, "Enhancing Novice EFL Teachers' Competency in AI-Powered Tools Through a TPACK-Based Professional Development Program," *World Journal of English Language*, vol. 15, no. 3, p. 117, Dec. 2024, doi: 10.5430/wjel.v15n3p117.
- [5] A. Hayati and M. Zaim, "Students' Perception Toward Teachers' Implementation of Technological Pedagogical and Content Knowledge (TPACK) in EFL Classroom at Madrasah Aliyah," *AL-ISHLAH: Jurnal Pendidikan*, vol. 16, no. 1, pp. 328–335, Mar. 2024, doi: 10.35445/alishlah.v16i1.4529.
- [6] M. S. A.-A. Othman, "A Program Based on TPACK for Enhancing Prospective Teachers' EFL 21st Century Skills," *CDELT Occasional Papers in the Development of English Education*, vol. 85, no. 1, pp. 331–368, Jan. 2024, doi: 10.21608/opde.2024.349218.
- [7] J. Prayudha.S and A. Pradana, "Unravelling EFL teachers' mastery of TPACK to promote students' participation," *Erudita: Journal of English Language Teaching*, vol. 3, no. 2, pp. 132–143, Nov. 2023, doi: 10.28918/erudita.v3i2.1153.
- [8] A. Haleem, M. Javaid, M. A. Qadri, and R. Suman, "Understanding the role of digital technologies in education: A review," *Sustainable Operations and Computers*, vol. 3, pp. 275–285, 2022, doi: 10.1016/j.susoc.2022.05.004.

- [9] Zawacki-Ritcher, *Systematic Reviews in Educational Research*. Wiesbaden: Springer Fachmedien Wiesbaden, 2020. doi: 10.1007/978-3-658-27602-7.
- [10] R. S. Wahono, "A Systematic Literature Review of Software Defect Prediction: Research Trends, Datasets, Methods and Frameworks," *Journal of Software Engineering*, vol. 1, no. 1, 2015, [Online]. Available: <http://journal.ilmukomputer.org>
- [11] "Guidelines for performing Systematic Literature Reviews in Software Engineering," 2007.
- [12] M. J. Page *et al.*, "The PRISMA 2020 statement: An updated guideline for reporting systematic reviews," *J. Clin. Epidemiol.*, vol. 134, pp. 178–189, Jun. 2021, doi: 10.1016/j.jclinepi.2021.03.001.
- [13] R. N. Aisyah, S. Setiawan, and A. Munir, "Technological Pedagogical Content Knowledge (TPACK) in Action: Unraveling Indonesian English as a Foreign Language Teachers' TPACK by Implementing Telegram."
- [14] N. A. Drajati, H. Rakerda, H. Sulistyawati, J. Nurkamto, and M. Ilmi, "Investigating the Adoption of TPACK-21CL by English Pre-Service Teachers in a COVID-19 Teaching Practicum," *Indonesian Journal of Applied Linguistics*, vol. 11, no. 1, Jun. 2021, doi: 10.17509/ijal.v11i1.34625.
- [15] B. Shambare and C. Simuja, "Unveiling the TPACK pathways: Technology integration and pedagogical evolution in rural South African schools," *Computers and Education Open*, vol. 7, p. 100206, Dec. 2024, doi: 10.1016/j.caeo.2024.100206.
- [16] X. Tan, G. Cheng, and M. H. Ling, "Investigating the mediating role of TPACK on teachers' AI competency and their teaching performance in higher education," *Computers and Education: Artificial Intelligence*, vol. 9, p. 100461, Dec. 2025, doi: 10.1016/j.caeai.2025.100461.
- [17] B. L. Lakhe Shrestha, N. Dahal, Md. K. Hasan, S. Paudel, and H. Kapar, "Generative AI on professional development: a narrative inquiry using TPACK framework," *Front. Educ. (Lausanne)*, vol. 10, Jun. 2025, doi: 10.3389/feduc.2025.1550773.
- [18] N. Shandu-Omukunyi, "English first additional language learning and teaching with digital resources," *South African Computer Journal*, vol. 35, no. 1, pp. 184–200, 2023, doi: 10.18489/sacj.v35i1.1109.
- [19] B. L. Lakhe Shrestha, N. Dahal, Md. K. Hasan, S. Paudel, and H. Kapar, "Generative AI on professional development: a narrative inquiry using TPACK framework," *Front. Educ. (Lausanne)*, vol. 10, Jun. 2025, doi: 10.3389/feduc.2025.1550773.
- [20] C. Rwodzi and L. De Jager, "Resilient English Teachers' Use of Remote Teaching and Learning Strategies in Gauteng Resource-Constrained Township Secondary Schools," *Perspectives in Education*, vol. 39, no. 2, pp. 62–78, 2021, doi: 10.18820/2519593X/PIE.V39.I3.6.
- [21] S. Setuju *et al.*, "Development of E-Learning to Improve Student Activity with Technological Pedagogical and Content Knowledge," *International Journal of Engineering & Technology*, vol. 7, no. 2.5, p. 100, Mar. 2018, doi: 10.14419/ijet.v7i2.5.13961.
- [22] F. Zahran, "The Impact of Using Poe ChatGPT-Based TPACK Model on English as a Foreign Language Teachers' Performance and Their Students' Vocabulary Learning," *Higher Learning Research Communications*, vol. 15, no. 1, Feb. 2025, doi: 10.18870/hlrc.v15i1.1622.
- [23] A. O. Theodorio, T. W. Mataka, and B. Shambare, "Teacher educators' use of mind mapping in the development of TPACK in a technology-rich learning environment," *Educ. Inf. Technol. (Dordr.)*, vol. 29, no. 14, pp. 18675–18694, Oct. 2024, doi: 10.1007/s10639-024-12587-1.
- [24] M. Zhang and X. Fang, "Exploring University EFL Teachers' Technological Pedagogical Content Knowledge and Teacher Efficacy in Technology-integrated Flipped Classroom," *Sage Open*, vol. 12, no. 3, Jul. 2022, doi: 10.1177/21582440221116105.
- [25] T. AYDIN YILDIZ, "The Relationship between TPACK and Self-Efficacy of the English Teachers of Gifted Students in Science and Art Centres: A Sample of Türkiye," *Participatory Educational Research*, vol. 11, no. 2, pp. 117–134, Mar. 2024, doi: 10.17275/per.24.22.11.2.
- [26] I. Sabah, G. Alhamid, and B. Mohammad-Salehi, "Examining EFL Teachers' Technological Pedagogical Content Knowledge (TPACK) and their Attitudes towards Online Teaching," *Journal: Language Education and Acquisition Research Network*, vol. 17, no. 1, pp. 715–733, [Online]. Available: <https://so04.tci-thaijo.org/index.php/LEARN/index>
- [27] C. Qiu, H. He, G. Chen, and M. Xiong, "Pre-service teachers' perceptions of technological pedagogical content knowledge in mainland China: A survey of teachers of Chinese as a second language," *Educ. Inf. Technol. (Dordr.)*, vol. 27, no. 5, pp. 6367–6391, Jun. 2022, doi: 10.1007/s10639-022-10888-x.

- [28] T. T. T. Nguyen and Y. Takashi, "Online Course Design Using VoiceThread with TPACK Model to Enhance English Speaking Skills for Non-native Learners," *International Journal of Engineering Pedagogy (ijEP)*, vol. 12, no. 1, pp. 33–50, Feb. 2022, doi: 10.3991/ijep.v12i1.24407.
- [29] M. Zhang and S. Chen, "Modeling dichotomous technology use among university EFL teachers in China: The roles of TPACK, affective and evaluative attitudes towards technology," *Cogent Education*, vol. 9, no. 1, Dec. 2022, doi: 10.1080/2331186X.2021.2013396.
- [30] M. M. Uddin and R. Peter Bailey, "Students' Perception of the Effects of Integrating EdTech in Teaching English Poetry in Higher Education in Bangladesh," *The International Journal of Learning in Higher Education*, vol. 31, no. 2, pp. 33–55, 2024, doi: 10.18848/2327-7955/CGP/v31i02/33-55.
- [31] S. Usman, B. Arafah, M. Marhum, S. Munir, Budi, and N. Tadeko, "The Effect of Technological Pedagogical Content Knowledge (TPACK) on Rural Area Students' English Writing," *Journal of Language Teaching and Research*, vol. 15, no. 3, pp. 884–892, May 2024, doi: 10.17507/jltr.1503.21.
- [32] F. Abu-Hardan, D. A. Al-Jamal, and I. Tawfiq Sa'di, "TPACK: Time to be Considered in Teaching Reading," *International Journal of Learning, Teaching and Educational Research*, vol. 18, no. 6, pp. 68–95, Jun. 2019, doi: 10.26803/ijlter.18.6.5.
- [33] N. Nugroho, "Enhancing EFL Students' Essay Writing Skills Through TPACK-Driven Flipped Learning: A Lesson from Lecture-Based Instruction," *Journal of Languages and Language Teaching*, vol. 14, no. 1, pp. 42–52, Jan. 2026, doi: 10.33394/jollt.v14i1.16834.
- [34] P. Amelia, D. Rukmini, J. Mujiyanto, and D. A. L. Bharati, "Investigating the Development of Teachers' TPACK and the Adoption of Digital Storytelling: A Case Study of Teaching English in Elementary School," *The Journal of AsiaTEFL*, vol. 18, no. 2, pp. 701–710, Jun. 2021, doi: 10.18823/asiatefl.2021.18.2.25.701.
- [35] Y. Wang, "Application of app intelligent voice software based on dynamic heterogeneous network in TPACK oral English teaching," *International Journal of System Assurance Engineering and Management*, Sep. 2023, doi: 10.1007/s13198-023-02117-6.
- [36] L. D. Prasajo, A. Habibi, A. Mukminin, and M. F. M. Yaakob, "Domains of Technological Pedagogical and Content Knowledge: Factor Analysis of Indonesian In-Service EFL Teachers," *International Journal of Instruction*, vol. 13, no. 4, pp. 593–608, Oct. 2020, doi: 10.29333/iji.2020.13437a.
- [37] C. Kaur Swaran Singh and Z. Mohd Kasim, "Pre-service Teachers' Mastery of Technological Pedagogical Content Knowledge for Teaching English Language," *Universal Journal of Educational Research*, vol. 7, no. 10A, pp. 24–29, Oct. 2019, doi: 10.13189/ujer.2019.071705.
- [38] A. Lisa, A. Faridi, D. A. L. Bharati, and M. Saleh, "A TPACK-in Practice Model for Enhancing EFL Students' Readiness to Teach with Ed-Tech Apps," *International Journal of Interactive Mobile Technologies (ijIM)*, vol. 15, no. 17, p. 156, Sep. 2021, doi: 10.3991/ijim.v15i17.23465.
- [39] Y. Ning, Y. Zhou, T. T. Wijaya, and J. Chen, "Teacher Education Interventions on Teacher TPACK: A Meta-Analysis Study," *Sustainability*, vol. 14, no. 18, p. 11791, Sep. 2022, doi: 10.3390/su141811791.
- [40] Y. Zeng, Y. Wang, and S. Li, "The relationship between teachers' information technology integration self-efficacy and TPACK: A meta-analysis," *Front. Psychol.*, vol. 13, Dec. 2022, doi: 10.3389/fpsyg.2022.1091017.
- [41] A. I. Muslimin, N. Mukminien, and F. M. Ivone, "TPACK-SAMR digital literacy competence, technostress, and teaching performance: Correlational study among EFL lecturers," *Contemp. Educ. Technol.*, vol. 15, no. 2, p. ep409, Apr. 2023, doi: 10.30935/cedtech/12921.
- [42] İ. Kozikoğlu and N. Babacan, "The investigation of the relationship between Turkish EFL teachers' technological pedagogical content knowledge skills and attitudes towards technology," *Dil ve Dili Bilimi Çalışmaları Dergisi*, vol. 15, no. 1, pp. 20–33, Apr. 2019, doi: 10.17263/jlls.547594.
- [43] M. Mualim *et al.*, "Evaluating INSTALL as an instructional model to enhance EFL pre-service teachers' TPACK: a case of three Indonesian universities," *Front. Educ. (Lausanne)*, vol. 10, Jun. 2025, doi: 10.3389/feduc.2025.1580173.
- [44] X. Zhou, Y. Padron, and H. Waxman, "English as a Foreign Language Teachers' Technology Professional Development Needs," *International Journal of Contemporary Educational Research*, vol. 11, no. 1, pp. 117–130, Mar. 2024, doi: 10.52380/ijcer.2024.11.1.631.

Authors



Siti Aminatuz Zahro is a student majoring in English Language Education at the Faculty of Cultural Studies, Brawijaya University. She is interested in researching technology integration in English language teaching to develop strategies that can help educators utilize technology optimally, making English learning more interactive, engaging, and relevant for students. (email: amynatuzzahro@student.ub.ac.id).



Ive Emaliana     is an Associate Professor at Universitas Brawijaya, Indonesia. She serves in the Academic Functional Group (KKJF) at the Center for Educational Relevance Development, DIPPP, and is an Organizing Committee Member of the CITED Hub Indonesia. Her research focuses on educational psychology, epistemic beliefs, language assessment, and inclusive education. She is committed to advancing equitable and evidence-informed language education and has authored numerous peer-reviewed publications while actively engaging in international research collaborations on teacher development and inclusive assessment. (email: ive@ub.ac.id).



Khairil Azwar Razali    is affiliated with the Faculty of Sustainable Tourism and Contemporary Languages, International Islamic University Malaysia. Khairil is currently the Head of Research at the faculty. His research areas include ESL, ESP course design, language assessment, and organisational communication. (email: khairilrazali@iium.edu.my).



Dr. Frida Unsiah    is a lecturer at Universitas Brawijaya specializing in English Language Teaching (ELT). Her research focuses on English language education, English for Specific Purposes (ESP), English Medium Instruction (EMI), educational technology, learner autonomy, and digital literacy. She has published scholarly works on AI-assisted language learning, higher education internationalization, and culturally responsive digital literacy initiatives. (email: frida_unsiah@ub.ac.id).



Ulfah Sutiyarti    is a faculty member at the Faculty of Cultural Studies, Universitas Brawijaya, Indonesia. She specialises in Japanese language education, with research interests in Japanese language teaching, digital instructional materials, interactive learning media, curriculum implementation, and language assessment. She has published extensively on Japanese language pedagogy, instructional media, classroom methodology, and language learning outcomes. (Email: ulfah_s@ub.ac.id)



Dr. Wan Nurul Elia Haslee Sharil    is a senior academic at Universiti Teknologi MARA (UiTM), Malaysia, specializing in Teaching English as a Second Language (TESL), English Language Teaching (ELT) methodology, and ESL teacher education. Her research focuses on teacher professional development, TPACK, educational technology, virtual reality in language learning, and innovative pedagogical approaches to enhance English language teaching and communication skills. (email: nurulelia@uitm.edu.my).



Dr. Rafidah Sahar    is an Assistant Professor at the International Islamic University Malaysia (IIUM). She holds a Ph.D. in Education from the University of Manchester, a Master's in English Literature from the University of Malaya, and a Bachelor's degree in TESOL from the University of Warwick. Her research focuses on intercultural communication, English literature, feminism, TESOL, language education, and culturally responsive pedagogical practices. (email: srafidah@iium.edu.my).