TPACK IN CURRENT ELT IN INDONESIA DURING AND PASCA COVID-19 PANDEMIC

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Abstract: The pandemic Covid-19 has impacted on many aspects, one of which was the education system that has caused significant shift in the way people learn. It forced the educators and the students to teach and learn from the conventional methods to the virtual learning in which most of the time they employed more technology in their instructional activities. It is believed that in order to conduct an effective lesson in class, teachers should develop and master the instructional activities based TPACK framework. This systematic review reports the current trends is Technological Pedagogical Content Knowledge in the context of English language teaching (ELT) during and pasca Covid-19 pandemic. This study aims at providing a comprehensive overview of existing work as well as some potential directions for future TPACK research in ELT. A total of 16 papers were chosen and synthesized from five journal database. The findings revealed that TPACK has received ongoing interest from researchers in Indonesia especially during and after the Covid-19 pandemic. Among the 16 papers reviewed, the phrase TPACK appeared in the title and abstract of each. Qualitative methods have been used more frequently in TPACK research than quantitative one.

Keywords: literature review; research trends; TPACK; english language teaching

INTRODUCTION

The global spread of the Covid-19 pandemic has had a serious impact on the sector of education. The Covid-19 pandemic emerged suddenly over the countries in the beginning of 2020, and as a result, the teaching and learning activities at school have shifted from the in-person class to the virtual class. The implementation of e-learning has emerged as a substitute strategy for ensuring that the teaching and the process of learning can continue while keeping both teachers and students safe. This circumstance has compelled accepting abrupt changes in the teaching and learning methodology from both teachers and students from in-person instruction to online instruction (Md. Lazim et al., 2021). In addition, this condition has forced the teachers to master not only the content of the lesson but also the use of technology to support the virtual learning, so the lesson is delivered effectively. As a result, this unexpected condition has made teachers encounter several difficulties in incorporating technologies into the classroom. (Francom et al, 2021).

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Over three years since early 2020 the Covid-19 was considered as a pandemic, the World Health Organization (WHO) officially announced the end of the worldwide Public Health Emergency (PHE) related to COVID-19 (World Health Organization, 2023). Although the pandemic Covid-19 is considered over and the teaching and learning activities are brought back to school, the influence of technology-based instruction remains exist in the process of instructional activities. Fatimah & Santiana (2017) stated that technology offers interesting and various activities for the teachers and the students and give them experience of interesting and interactive interaction in the classroom. Similarly, the development of technologies helps learners comprehend better the course content and obtain good results in the classroom (Roy, 2019). Unfortunately, not all teachers have the competence in using technology and incorporating them into teaching and learning activities. Harris et.al (2009) claims that teachers have limited scope, diversity, and depth in their application to the use of educational technologies in K-12. Similarly, Buabeng-Andoh, C. (2012) in their study found that teachers were lack of computer literacy due to lack of training and access to equipment in classroom. Lacking any of the technological knowledge will impede teachers from incorporating educational technologies in the classroom (Wen & Kim, 2020).

Meanwhile, teachers must have the knowledge of technology and use it together with the knowledge of the subject (Lim et. al, 2021). According to Valtonen et.al (2017), teachers should be familiar with myriads pedagogical approaches and understand how to effectively employ ICT to assist the growth of their students' twenty-first century skills. A teacher is regarded as competent if they possess strong pedagogical, content, and technology skills, know how to use them in the classroom, and have a positive attitude toward e-learning (Baber, 2021). This technological pedagogical content knowledge that the teacher must possess is widely recognized as TPACK. TPACK that stands for Technological Pedagogical Content Knowledge is defined as the as 'the whole of knowledge as insights that underlie teachers' actions with technology in practice (Voogt at.al, 2016). The notion of TPACK is gaining attention and has been adopted in numerous countries, aiming to comprehend and improve educators' capacity for integrating ICT (Dong et.al, 2016). Lim et. al, (2021) contends that TPACK is conceptual models that have been developed by the experts to promote teacher's professional development.

TPACK is a learning design framework that links technology, learning materials with the classroom learning process (Baran et al., 2011; Koehler et al., 2013:2014). There are 3 main domains in Technological Pedagogical Content Knowledge (TPACK), namely Technological Knowledge (TK), Content Knowledge (CK), and Pedagogical Knowledge (PK) (Mishra & Koehler, 2006; Thompson & Mishra, 2007–2008, 2009; Koehler et al., 2013). According to Goradia (2018), Content Knowledge (CK) encompasses the teachers' grasp on the subject content including theories, evidence-based reasoning, and practices specific to the discipline, Pedagogical Knowledge (PK) involves teachers' knowledge and comprehension about teaching and learning and Technology Knowledge (TK) involves teachers' understanding on technology for information processing, communication, and problem solving (Goradia, 2018). This framework elaborates the distinctive knowledge teachers require for effectively combining technology, teaching methods, and subject matter (Brianza, E., Schmid, M., Tondeur, J., & Petko, D, 2023).

The implementation of TPACK in learning is designed by identifying the relationship between technology, learning materials, and the material delivery process. The aim of implementing the TPACK framework is that students can understand the concept of learning material by integrating technology functions. TPACK proves to be a valuable framework for assessing the knowledge needed to facilitate the integration of technology in educational practices (Mtebe & Raphael, 2018), supports teachers' processes of thought, analysis, and evaluation of the critical features they need to effortlessly integrate technology into their classes (Putri et. al, 2022), and a teacher who possesses a high level of TPACK is recognized as the one who has attained mastery in integrating technology into teaching and learning activities (Lim et. al, 2021).

As a result, it is critical to study the current trends in TPACK especially in English Language Teaching (ELT). Researchers will be able to grasp recent TPACK research developments in the topic area by providing insights into current trends in TPACK studies, notably in English language education. We can then identify the gaps in existing TPACK research in the field of English language teaching. To the best of the researcher's knowledge, systematic literature reviews of current research on TPACK in the context of English language instruction are scarce. As a result, the purpose of this systematic review is to investigate current trends in TPACK research in English language education literature published during and pasca Covid-19 pandemic. The following research question will guide this systematic literature review: "What are the trends and characteristics of research published from the beginning of Covid-19 pandemic (2020) to pasca-pandemic (2023)?" This paper reviews the research published from the last 4 years that focuses on the trends and characteristics on TPACK in English language Teaching (ELT).

METHOD

In order to achieve the aims of this research, the researcher employed qualitative research in the form of a Systematic Literature Review. A systematic review is a review of a clearly defined subject that use systematic and explicit procedures to find, select, and critically appraise relevant research, as well as to gather and analyze data from the included studies (Siddaway et.al, 2019). The first step in doing this systematic literature review is to establish keywords or a group of key terms to look for publications that are related to TPACK. The keywords that are utilized to sort the articles are "TPACK", "Technological Pedagogical Content Knowledge", "ELT", "EFL", and "INDONESIA" using additional coordinative conjunction "AND". Databases including CORE, ERIC, Taylor & Francis, Semantic Scholar and Google Scholar were all thoroughly searched.

Through this method, the researcher looks at the key instruments that collects data through inspection document. This study apply systematic literature review (SLR) method, summarizes the literature of deep awareness by assessing past studies. The current study employs the approach four similar phases namely search, screening and eligibility, and search, filtering, eligibility, and inclusion (Sahlan et. al, 2020). For the current study, the researcher established clear criteria for which materials to include. For instance, between 2020 and 2023, papers should be authored in English and published in

journal publications. Note that the analysis did not include books or book chapters, conference proceedings, editorial materials, or corrections.

The initial search turned up 188 papers. To make sure the target papers met the requirements and there were no duplicates, the researcher next reviewed each manuscript and double-checked all of the records. The researcher looked at the titles, abstracts, and complete texts before choosing the final articles for review. Following data filtering, 124 articles that did not pertain to the subject of the analysis were removed. Furthermore, the researcher read the entire text of each publication during the selection process. The relevance of the papers to the primary research issues and if they fit the inclusion criteria in order to produce an accurate and thorough systematic evaluation were considered. The researcher then carried out an independent evaluation if there was any doubt regarding whether the material matched the inclusion criteria. Consequently, 16 papers were chosen for review since they matched the inclusion criteria. The findings were limited to subcategories of the research question.

Table 1. Subcategory of research question

Research Question	Sub-Categories
What are the trends and characteristics of research published from the beginning of Covid-19 pandemic (2020) to pasca-pandemic (2023)?	Year distribution of the research
	Samples employed in the studies
	Methodologies used of included researches (qualitative, quantitative,mixed method)
	Measurement to the level of TPACK
	Correlation between TPACK and Other
	Year distribution of the research

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RESULT AND DISCUSSION

The following subcategories were developed and evaluated by the researchers in order to respond to the research question: Distribution of the studies by years, samples employed in the studies, methodologies used of included research (qualitative, quantitative, mixed method, measurement to the level of TPACK, correlation between TPACK and Other Variables, and strategy to Develop TPACK. The details of the subcategories are provided in the section that follows.

Image 1 displays the research' publication dates in relation to the research on the TPACK in English Language Teaching (ELT) in Indonesia. The results of the analysis indicate that the number of reviewed studies in this field has fluctuated. The first study in this field was published in 2020 (n=2). Thereafter, the number of studies increased in 2021 (n=6) and decreased in 2022 (n=2) but continue to increase in 2023 (n=6). The years 2020 until 2023 (n=16) are the greatest study on the TPACK in English Language Teaching (ELT) in Indonesia. The current findings are also supported by a study conducted by Jinyao &

Bhattacharyya (2022) that the research trends on TPACK have been fluctuated since 2015 to early 2020 but progressing significantly in 2021 and onwards.
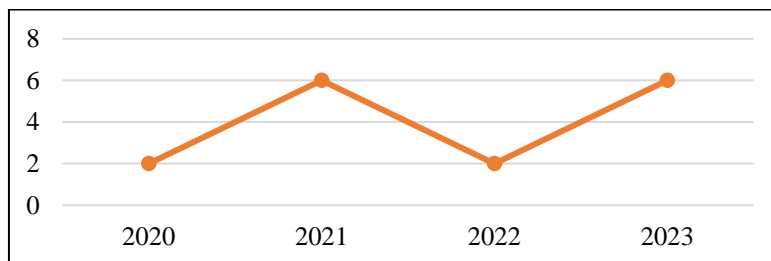

Image 1. The number of articles by year

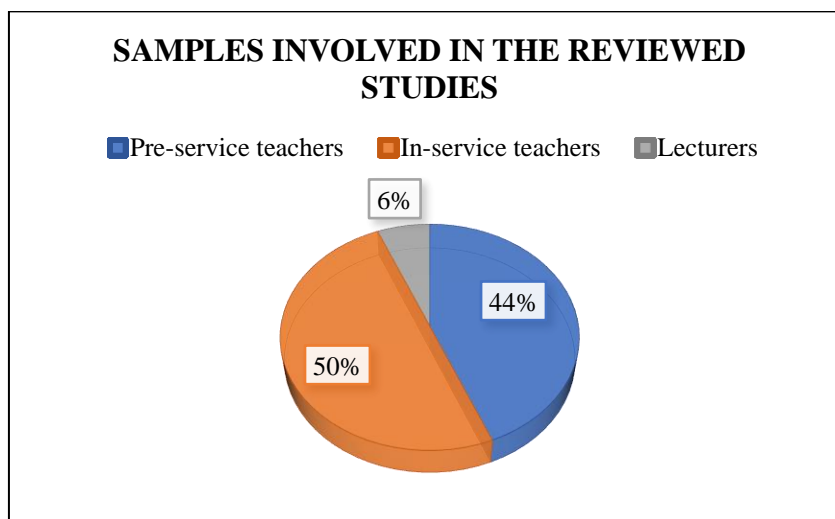In addition, Image 2 shows the percentage of samples involved in the reviewed studies.

Image 2. The number of articles by year

Based on Image 2, 8 out of 16 or 50% of the selected papers involved in-service English language teachers as the participants while 44% involved pre-service English language teachers. Only 1 study (6%) involved lecturers of English language as the participants. The present study shows that pre-service teachers are most employed in the studies due to the fact that the TPACK must be integrated in teacher preparation program (Nuangchalerm, 2020), also TPACK should be implemented in teacher development program (Stover & Veres, 2013). On the other hand, the presence of in-service teachers to participate in the TPACK's research is due to its essential role to promote effective teaching in the 21st century (Wang, 2022) and to adapt to evolving educational environment (Yeh et al., 2015).

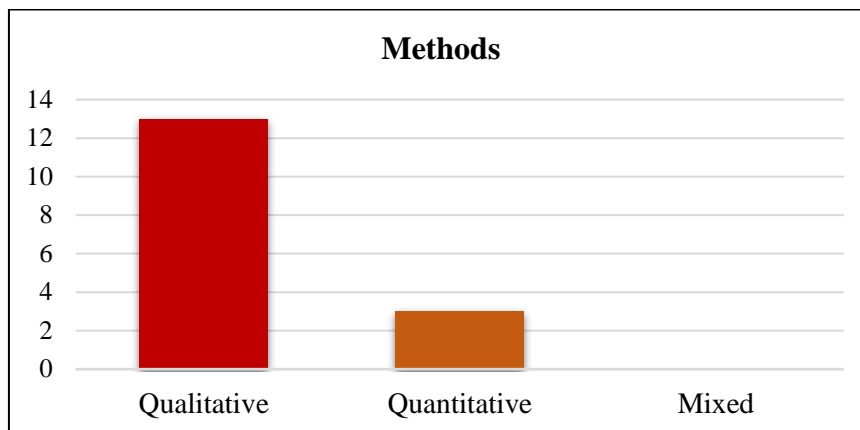Furthermore, Image 3 shows the percentage of research methods used in the reviewed studies.

Image 3. Percentage of research methods

As shown in Image 3, most of the studies which are 13 out of 16 or 82% employed the qualitative method. Only 3 studies or 18% employed quantitative method and none of the study used mixed method. The quantitative methods were discovered to be the most popular among TPACK researchers and instructors. This could be because the sample size is often deemed representative of the community (Laverack & Pratley, 2018) and allows the researchers to delve into in-depth exploration of the studied phenomena, meanwhile quantitative studies can reach a large audience, can be replicated within a larger population, and allow researchers to generalize findings (McCusker & Gunaydin, 2015).

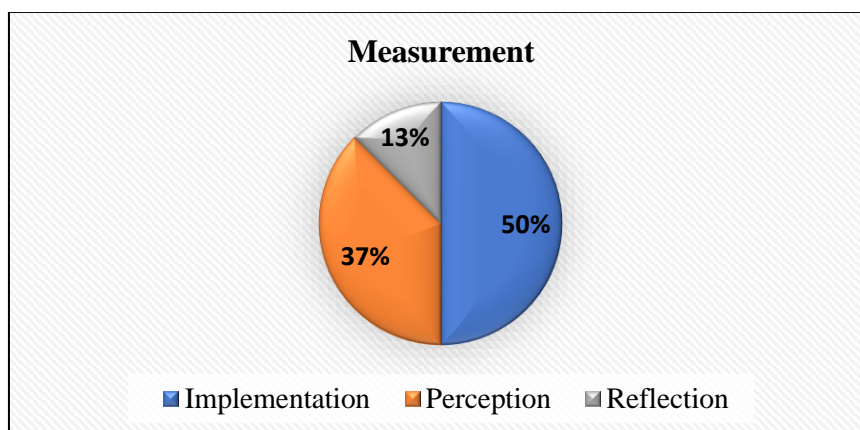The following figure explains the measurement of TPACK level from the reviewed studies.

Image 4. Measurement of TPACK level

Based on Image 4, out of the 16 reviewed studies examined, there are three main ways to assess level of participants' TPACK namely implementation, perception, and reflection. Eight studies (S1, S6, S7, S8, S11, S12, S15, S16) measure TPACK level through implementation. The measurement of TPACK level through implementation according to Lim et al (2021) is that the TPACK level is measured based on the integration of

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classroom practices that depicts their competence of TPACK. Meanwhile, there are six reviewed studies (S4, S5, S9, S10, S13, S14) assess TPACK level through perception that means they completed questionnaires to determine their perceived TPACK. The perception of TPACK level indicates that participants form an opinion about their TPACK level (Lim et al, 2021). As for the reflection, 2 out of 16 reviewed studies measure TPACK through reflection. The TPACK level measured by reflection means that they considered their own actions, thoughts, experiences and involved evaluation and introspection to obtain knowledge into personal strength and weakness. The reviewed studies identified pre-service teachers, in-service teachers, and lecturers.

Among the 16 articles from the analysis of the reviewed studies, three studies (S6, S13, S15) specifically investigated how TPACK relates to demographic aspects, two studies (S6, S13) reported the TPACK of teachers teaching in urban and rural area and one study (S15) identified the TPACK of novice and experience teachers. The relationship between a teacher's TPACK and its subcomponents within their specific subject area is also often explored. In relation to this, there are eight studies (S1, S2, S3, S4, S7, S8, S11, S16) delved into the association between TPACK and the content knowledge (S2, S11, and S16), namely listening, reading, and writing, pedagogical knowledge (S1, S15), and technological knowledge (S4, S7, S8). Two studies (S5, S9, S10) revealed the relationship between TPACK with attitudinal variables, and the last is related to professional development (S12, S14). Thus, the demographic characteristics, subcomponents of TPACK, attitudes, and professional development can become the predictors of TPACK.
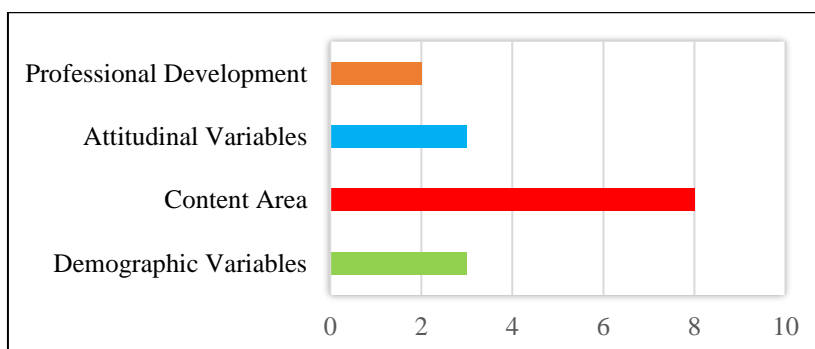

Image 5. Relationship between TPACK and Other Variables

Several reviewed studies (S1, S3, S4, S7, S8) proposed various approaches to enhance TPACK. One of the reviewed studies (S3) emphasized the significance of reflective practice in developing EFL teachers' TPACK where the teachers were asked to immerse in regular self-reflection, learn from what went well and what did not go well in the classroom, and invite colleagues to observe the technology-integrated lessons and get constructive feedback and insights from peers to enhance the TPACK. Two of the reviewed studies (S1, S4) outlined modeling and mentoring practices for TPACK enhancement. It involved novice teachers with experienced teacher establishing model effective ways to integrate technology, pedagogy, and content in teaching started from designing lesson plans, implementing in the instructional activities, and evaluation. Meanwhile, S7 and S7 pointed out the importance of ICT practices in teaching as effective strategy to develop teachers' TPACK competence.

CONCLUSION

In conclusion, the analysis of the 16 reviewed studies published between 2020 and 2023 on TPACK revealed that this field of study has progressively contributed to the journal database. The results indicated a continuous research focus on TPACK in Indonesia, particularly during and post the Covid-19 pandemic. During and pasca the Covid-19 pandemic, the year with the most papers written was specifically 2021, followed by 2023. The abbreviation TPACK was discovered to be used in the sample papers as it was in the title, abstract, and/or keywords. The most popular research techniques over the past 4 years among TPACK scholars have been qualitative and then followed by quantitative method. The qualitative method was employed more frequently in TPACK research compared to quantitative method. Additionally, the findings proposed three approaches for assessing TPACK proficiency: implementation, perception, and reflection. Moreover, there are four approaches were identified to enhance teachers' TPACK skills: engaging in reflective practice, modeling and mentorship, and integrating ICT practices in the classroom. There are also relationship between TPACK and other variables related to demographic aspect, TPACK's subcomponents, teachers' attitudes towards the TPACK, and professional development program. By identifying gaps in knowledge and areas where further research is needed, it is hoped that the various analyses of this literature review will make it easier for the future researchers interested in TPACK research, particularly TPACK in English Language Teaching, to find appropriate and diverse references and formulate what topics need to be researched for further studies.

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