

TPACK Levels of Indonesian Language Teachers: A Survey in Rural Junior High Schools

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Abstract—There is a gap in the implementation of TPACK in Indonesia. Urban schools often outperforming rural ones. This study aims to measure the level of implementation of TPACK elements in Indonesian language learning in rural junior high schools based on teacher perceptions. The case study involved 224 teachers from 5 regencies in Central Java, where internet access is moderate to slow. Data were collected through questionnaires, in-depth interviews, and focus group discussions (FGDs). The results indicate that most Indonesian language teachers in rural areas feel most competent in mastering material and pedagogy. However, when it comes to the application of technology in the classroom, the majority of teachers' performance does not align with their beliefs about their technological proficiency. This disconnect is due to various external challenges, including limited internet access, inadequate facilities, and restrictive school policies, which prevent teachers from utilizing technology in a way that aligns with their beliefs. However, a small portion of the issue can be attributed to internal challenges, such as a lack of confidence or feelings of inadequacy due to age. In terms of school status, there are notable differences in technology application, with private schools in rural areas being more advanced than public schools. The factors that cause limitations in public schools need to be studied further.

Index Terms—TPACK, Indonesian language, rural junior high school, public school, private school

I. INTRODUCTION

The demand to integrate technology into learning during the COVID-19 pandemic has highlighted the competencies that teachers must master in the post-pandemic era. Teacher competency is defined as a cognitive performance disposition that is functionally responsive to specific situations and demands (Konig et al., 2020, p. 4). Teachers are required to be able to utilize knowledge of materials, pedagogical experience, and new technologies known as the technological, pedagogical, and content knowledge or TPACK framework (Galanti et al., 2020, p. 2). TPACK is a framework that emphasizes the interaction among three elements, including materials, pedagogy, and technology. These elements are important for developing good teaching practices because teachers use technology effectively to teach (Zhang, 2020, p. 39).

Many studies have proven the effectiveness of learning by applying the TPACK framework, but researchers have identified gaps in technology implementation in education, particularly between urban and rural areas. Huang et al. (2020) found that the COVID-19 pandemic accelerated the digitalization of education, contributing to increasing the digital divide in China and the UK (Choi et al., 2020). The findings showed that teachers in urban schools excel because they are more adept at synchronous and asynchronous learning, while teachers in rural areas predominantly rely on asynchronous learning (Lin & Gao, 2020; Libasin et al., 2021). Meanwhile, Mwinyi (2024) found that infrastructure and resource limitations in rural areas hindered the adoption of educational technology, making the challenges of implementing TPACK particularly significant.

The inequality in applying the TPACK framework in urban and rural areas can affect the significance of student learning progress. A study by Carvalho and Goodyear (2019), which investigated the use of augmented reality in technology-based learning in various environments, concluded that student achievement improved in both urban and rural areas. Similarly, Li (2025) study on the impact of TPACK on students' mathematics abilities highlighted the positive effects of TPACK integration in rural areas in China, specifically an increase in students' academic achievement in mathematics. Chatterjee et al. (2020) found that the use of technology (mobile applications) developed by girls' schools in rural India can improve the school's education system. Martina et al. (2022) studied the use of TPACK in teaching English in Bengkulu, Indonesia, during the COVID-19 pandemic and found that although urban teacher competence and technology facilities were superior, the application of TPACK was effective in overcoming problems in distance learning in both urban and rural schools. Shambare and Simuja (2024) also found low levels of TPACK competency among teachers in rural and marginalized areas in the Eastern Cape province of South Africa, and even found a large gap between

the two groups in the TPACK domain related to technology, including technological knowledge (TK), technological pedagogical knowledge (TPK), and overall TPACK competency.

Other challenges relate to technical and communication issues. Technical weaknesses are influenced by geographical factors, internet connectivity, and internet costs. Communication weaknesses arise from slow adaptation, suboptimal use of learning media, lack of interactive engagement, and an absence of empathetic communication (Hidayat et al., 2020, p. 67). In line with this, Febrianto and Megasari (2020, p. 233) found that geographical factors and internet access significantly impact the varying implementation of online learning in Indonesia. Putri et al. (2020, p. 4809) further identified additional challenges teachers face, including limited teaching method options, insufficient technological skills, a lack of electronic resources in Indonesia, and high internet costs.

Regarding the factors of urban and rural areas, TPACK research has been conducted by Bustamante (2020); Young et al. (2019) in the United States; Chaemchoy (2017) in Thailand; and Li (2025) in China. These studies found that teachers in urban schools demonstrated higher TPACK competence than those in rural schools. In Indonesia, comparative studies on TPACK in urban and rural areas remain limited, one of which is Martina et al.'s (2022) research in Bengkulu. Moreover, most TPACK research in Indonesia focused on a single city, regency, or province, such as studies by Eliyanto et al. (2021) in Kebumen, Agustin et al. (2019) in West Java, and Surahman et al. (2020) in South Garut. However, none of these studies have explored how schools in two different locations implement learning using the TPACK framework.

The general objective of this study is to measure the level of the TPACK framework implementation in Indonesian language learning in rural areas. Specifically, the study aims to examine the perceptions of Indonesian language teachers in rural junior high schools regarding the level of TPACK implementation, encompassing its seven components: TK, PK, CK, TPK, TCK, PCK, and TPACK in learning practices.

II. THEORETICAL FRAMEWORK

A. Technological Pedagogical and Content Knowledge (TPACK) Framework

Technological, pedagogical, and content knowledge (TPACK) is formulated as a framework for integrating technology in learning and teaching. TPACK was developed based on the concept of PCK (pedagogical and content knowledge) introduced by Shulman (1987). Mishra and Koehler later broadened PCK by incorporating technology, describing TPACK as the interaction between educational technology and PCK, working together to produce effective technology-based teaching (Koehler et al., 2013; Mishra & Koehler, 2020). The framework is visualized in Figure 1.

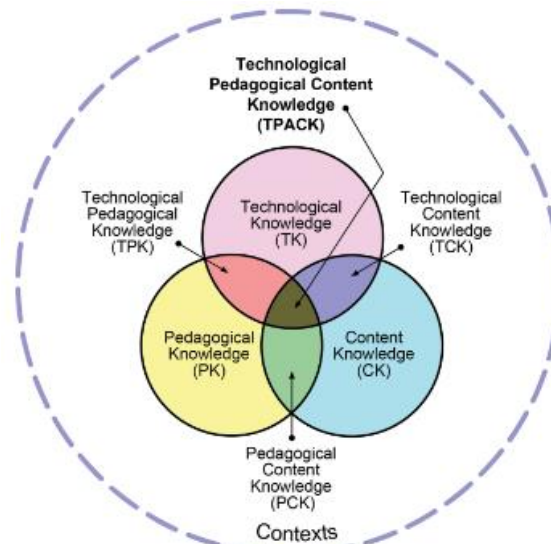


Figure 1. TPACK Framework

Figure 1 shows the seven components in the TPACK framework, namely CK, PK, TK, PCK, TCK, TPK, and TPACK (Schmidt et al., 2009).

B. TPACK-Based Language Learning

Not only in science subjects, technology used significantly impacts the success of language learning (Purnawarman et al., 2015, p. 242). Ghanizadeh et al. (2015, p. 73) explained that technology can support the development of all language skills, including listening, writing, reading, speaking, and viewing. Furthermore, Toding et al. (2024) emphasized that incorporating technology applications to teach language skills is recommended, as it enhances student participation, fosters collaborative activities, and stimulates students in ways that are not easily achieved in conventional classes. Technology-based language learning, including AI applications, facilitates active learning of language skills. Various types of texts and contexts must be acquired gradually, and students can achieve this independently with the support of

technology-based applications (Warnock, 2009).

Tseng et al. (2020, p. 2) highlighted the growing importance of integrating technology into language teaching, particularly in how language teachers present linguistic material using appropriate technology in line with the latest teaching model, namely the TPACK framework. The TPACK framework in language learning is considered a valuable tool for assessing language competence contextually (Inpeng & Nomnian, 2020, p. 370). TPACK supports teachers in implementing practical, non-theoretical learning and guides practice-oriented learning processes (Koehler et al., 2013).

III. METHODOLOGY

A. Design

This research was conducted using a mixed method, combining qualitative and quantitative ones. The study employed a case study approach, which is designed to answer the questions of "what," "how," and "why." The focus of the research was to describe the level of TPACK application in teaching and learning activities by Indonesian language teachers in rural junior high schools.

B. Participants and Sampling Techniques

This research focuses on Central Java Province, Indonesia, because of the significant gap in internet access within the education field. The selected regencies vary in terms of network availability, ranging from fast to low (4G, 3G, and 2.5G capacity). The schools chosen for the study are located outside city centers and are characterized by moderate to low internet access.

Through collaboration with the head of the Indonesian language subject teacher group in five regencies, 376 teachers were initially identified as meeting the criteria for participation. However, of the teachers who received the questionnaire, 224 fully completed and returned it, thus they were qualified as research participants. Therefore, participants were determined using the purposive sampling technique. The distribution of participants is presented in Table 1.

TABLE 1
RESEARCH PARTICIPANTS

Regency	Number of Participants	School status		Age
		Public	Private	
Purworejo	43	30	13	26 – 55
Magelang	41	26	15	23 – 52
Karanganyar	38	22	16	29 – 50
Boyolali	48	27	11	25 – 54
Wonogiri	34	25	9	32 – 52

C. Data Collection

To measure the level of TPACK implementation among Indonesian language teachers in rural schools, a questionnaire was distributed via *Google Forms*. The questionnaire included four response scales: ALWAYS, OFTEN, SELDOM, and NEVER. "ALWAYS" represents 100% of teaching activities aligned with the statement item, "OFTEN" represents 50% to less than 100% of appropriate teaching activities, and "SELDOM" represents less than 50% of appropriate teaching activities. The items in the questionnaire were developed based on the in-service teacher performance measurement instrument used in the professional teacher certification exam. The test instrument was developed from the TPACK framework. Some items were modified, while others were developed by the researchers to represent the seven components of TPACK. The questionnaire consists of 25 statement items, detailed as follows: CK = 3 items, PK = 3 items, TK = 4 items, PCK = 3 items, TCK = 5 items, TPK = 3 items and TPACK = 2 items.

In addition to the questionnaire, the level of TPACK implementation was assessed through in-depth interviews. These interviews were conducted face-to-face, with researchers visiting the schools. For teachers in remote schools with difficult road access, interviews were conducted by telephone. The interviews took place after the questionnaire was distributed.

D. Data Validity Test

To measure the validity and reliability of the questionnaire, Cronbach's alpha formula and Pearson correlation were used. The analysis using SPSS version 25 revealed that the overall composite validity coefficient was 0.934, indicating that all items were valid and reliable. For the qualitative data, validity testing was performed through triangulation of theory, method, and data sources.

E. Data Analysis

The data in this study include quantitative and qualitative data. Quantitative data were analyzed using basic statistics, including the calculation of frequencies and percentages, then presented in tables. Qualitative data were analyzed using an interactive model, involving the interaction of data collection activities, data condensation, data display, and conclusion drawing (Miles et al., 2014).

IV. RESULTS AND DISCUSSION

A. Content Knowledge (CK)

The distribution of teacher responses regarding CK, which refers to teachers' knowledge of the content of Indonesian language subject material, is presented in Table 2.

TABLE 2
LEVEL OF CONTENT KNOWLEDGE OF INDONESIAN LANGUAGE MATERIAL

States	Percentage			
	Always	Often	Seldom	Never
Teachers understand all the content of Indonesian language subjects that must be taught.	47.8 107	46.4 104	5.8 13	0 0
Teachers do not experience misconceptions regarding the content of Indonesian language subject material.	51.3 115	37.1 83	8.5 19	3.1 7
Teachers understand easy-difficult, simple-complex, and concrete-abstract material.	38.4 86	48.2 108	13.4 30	0.9 2

For the first item, the majority of teachers responded with 'always' and 'often.' Based on the interviews, the teachers' opinions were shaped by the following factors: (1) all materials were available in government-published textbooks, (2) teachers could answer all student questions related to the material, (3) most of the materials in the latest government textbooks were similar to those in previous editions, and (4) teachers had considerable teaching experience.

Regarding the second item, the majority of teachers gave 'always' and 'often' responses. The teachers mentioned two main reasons for their statements: (1) there were no difficult concepts in the Indonesian language subject material for junior high schools and (2) a summary of the material was provided by the Indonesian language subject teacher working group. A small number of teachers who selected 'seldom' and 'never' explained that misconceptions typically occurred in language or grammar materials, particularly with standard and non-standard words.

Dealing with the third item, the majority of teachers responded with 'always' and 'often' for some reasons: (1) the material details and its sequence were provided in both the teacher's and student's books and (2) for abstract material, pictures and explanations were usually included in the supplementary book. Meanwhile, a small number of teachers selected the 'seldom' response because there was a different understanding of concrete and abstract concepts between teachers and students.

Related to the content knowledge of the subject matter the findings of this study indicate that rural Indonesian language teachers generally feel they have a high level of understanding. Teachers reported a strong grasp of all types of texts taught, with no misconceptions, and they could distinguish between easy and difficult, simple and complex, and concrete and abstract materials. This finding aligns with the report of previous research, that teachers generally felt most competent in the CK or the content of their subject matter (Nguyen, 2024). In fact, another study concluded that CK is crucial for enhancing teachers' PCK skills (Schiering et al., 2023). This finding is supported by the outcome of prior research identifying a significant relationship between teacher knowledge and teaching quality (Haron et al., 2021).

B. Pedagogical Knowledge (PK)

The distribution of data of PK, which refers to teacher knowledge about the teaching process—including methods for managing classes, providing assessments, as well as developing lesson plans and student learning process—can be seen in Table 3.

TABLE 3
LEVEL OF PEDAGOGICAL KNOWLEDGE OF INDONESIAN LANGUAGE TEACHERS

States	Percentage			
	Always	Often	Seldom	Never
Teachers understand learning strategies that are appropriate for the needs, potential, and interests of students, as well as their learning styles.	30.4 68	59.4 133	7.1 16	3.1 7
Teachers understand various concrete media in learning to strengthen concepts in students.	33.8 75	50.1 113	12.5 28	3.6 8
Teachers understand the comprehensive assessment of the three domains (affective, cognitive, and psychomotor) according to learning objectives.	15.2 34	46 103	33.5 75	5.3 12

Regarding the first statement, the majority of teachers responded with 'always' and 'often' because (1) the teacher's book already provided information about learning strategies for each material and (2) teachers had received training on selecting differentiated and multicultural learning strategies. However, teachers who selected 'seldom' and 'never' explained that understanding the concept of differentiated learning was challenging, as it was a new approach introduced with the implementation of the Independent Curriculum in 2023.

For the second item, the majority of teachers also responded with 'always' and 'often'. These responses were based on

the fact that government textbooks, non-government textbooks, and teaching modules developed by teacher working groups already listed the media for each material, allowing teachers to easily implement them. Several teachers answered with 'seldom' and 'never' and stated that there was still confusion between the concepts of real object media and concrete media.

In terms of the third item, the responses of 'always' and 'often' were less dominant compared to the first and second items. Teachers selected 'always' and 'often' because of the following reasons: (1) the assessment tools, including assessment instruments, were explained in the teacher's book for all three domains and (2) the teachers had received training on assessment from teacher leaders. Meanwhile, the responses of 'seldom' and 'never' are linked to the implementation of diagnostic assessments, which still confuses some teachers.

The data show that teachers feel highly competent in their pedagogical knowledge. This aligns with the finding of a prior study that teachers are most confident in their pedagogical knowledge (Hill & Uribe-Florez, 2020). High confidence in pedagogical knowledge is reflected in how teachers integrate technology in a way that enhances their teaching activities. In fact, research has shown that teacher knowledge is a positive predictor of student achievement (Charalambous et al., 2020).

C. Technological Knowledge (TK)

Data on the level of implementation of knowledge related to various technologies, including computer software and hardware, from the most basic to the most advanced technology, is presented in Table 4.

TABLE 4
LEVEL OF TECHNOLOGICAL KNOWLEDGE OF INDONESIAN LANGUAGE TEACHERS

States	Percentage			
	Always	Often	Seldom	Never
Teachers understand the use of ICT devices to access learning materials	21.9 49	33.5 75	30.8 69	13.8 31
Teachers understand the use of ICT devices to facilitate learning	18.3 41	29.9 67	33.5 75	18.3 41
Teachers understand the use of ICT devices to carry out assessments	16.6 37	27.7 62	31.3 70	24.5 55
Teachers understand the use of ICT devices for learning administration	34.4 77	31.2 70	28.6 64	5.8 13

For the first item, over 60% of teachers specified that they were familiar with using technology-based devices to access learning materials, by responding 'always' and 'often'. The supporting factors include: (1) the availability of technology devices and reliable internet access both at school and at home, (2) the inclusion of materials in textbooks that could be accessed with a barcode, and (3) participation in ICT training. The reasons provided by teachers who selected 'seldom' and 'never' responses are: (1) very limited availability of technology-based devices at school, (2) very poor internet access at school, (3) lack of internet-enabled devices at home, including smartphones, (4) difficulty in operating internet-based technology, and (5) never having participated in ICT training due to age factors, particularly nearing retirement.

Regarding the second item, the majority of teachers responded with 'always' and 'often' for several reasons: (1) the availability of technology-based devices in each class, (2) good internet access at school, and (3) students being allowed to use smartphones for learning through coordination with guidance and counseling teachers. Teachers who responded with 'seldom' noted the following reasons: (1) technology-based devices for displaying materials were very limited and prioritized for certain subjects, (2) there was a ban on students bringing smartphones to class, and (3) internet access at school was not good. The reasons teachers struggled to understand the use of technology in learning were (1) insufficient knowledge of the concept of ICT-based devices and (2) the absence of ICT-based devices, such as computers and smartphones, at home.

For the third item, most teachers testified using ICT devices less frequently or not at all. Teachers who answered 'always' and 'often' pronounced the following motives: (1) familiarity with conducting assessments using *Google Forms* or *Quizizz* applications, (2) regularly asking students to submit assigned projects, such as speaking recordings, via smartphones, (3) availability of technology-based devices at school, such as LCDs and smart TVs, and (4) active participation in ICT training for learning. The teachers who gave 'seldom' or 'never' responses mentioned these reasons: (1) lack of mastery in operating communication technology devices, including smartphones, (2) not having smartphones, and (3) never having participated in ICT training for learning.

About the fourth item, the majority of teachers responded with 'always,' 'often,' and 'seldom'. These teachers explained that (1) storing learning data using ICT devices was more practical than doing so manually (handwritten), (2) administration using ICT devices was easier to access and more secure, such as on computers, flash drives, or *Google Drive*, and (3) they had ICT-based devices available both at school and home. Teachers who admitted 'never' stated the following reasons: (1) they lacked ICT-based devices and (2) they had visual impairments, making it difficult for them to use computer devices for extended periods.

The phenomena above highlight that teacher readiness is vital for the successful utilization of ICT learning devices, and this readiness can be fostered through proper training. This aligns with the findings of Makakoe et al. (2017), who explored teacher readiness to integrate technology in rural schools in Botswana. Their research revealed that the success

of TPACK implementation in rural environments depends on teachers' preparedness, which is achieved through intensive training. In this context, the research of Shambare and Simuja (2024) shows that teachers in rural South Africa have integrated technology into their pedagogy and content knowledge despite the absence of structured training. Similarly, Wells et al. (2015) examined the perceptions of rural principals on instructional leadership, which can provide valuable perspectives on the successful implementation of TPACK learning. Therefore, to maximize the effectiveness of TPACK implementation, teachers need to participate in training and certification programs, as recommended by Voithofer (2019).

All of those who responded 'always' were private school teachers, while those who responded 'often', 'seldom', and 'never' were both public school teachers and a small number of private school teachers. This indicates that private school teachers have an advantage in utilizing ICT in learning compared to public school teachers. When linked to the range of facilities used by private school teachers, it demonstrates the readiness and flexibility of private schools in providing ICT-based learning devices, as compared to public schools. This aligns with the findings of other research showing that teachers' workplaces significantly influence their perceptions of TK and TCK (Ibrohim et al., 2022).

D. Pedagogical Content Knowledge (PCK)

The data of teacher responses on PCK components are presented in Table 5.

TABLE 5
LEVEL OF PEDAGOGICAL CONTENT KNOWLEDGE OF INDONESIAN LANGUAGE TEACHERS

States	Percentage			
	Always	Often	Seldom	Never
Teachers use effective learning strategies based on the characteristics of the material.	37 83	55.4 124	7.6 17	0 0
Teachers apply variations of three-way interactions (teacher-student-material) when teaching complex material.	38.5 86	39.7 89	19.6 44	2.2 5
Teachers relate learning to students' real daily lives for abstract material.	34 76	46.8 105	17.4 39	1.8 4

The majority of teachers responded with 'always' and 'often' for some underlying causes: (1) the availability of learning implementation examples on YouTube, including the necessary media, (2) the presence of a detailed and complete flow of presentation of each material in non-government textbooks, and (3) training in innovative learning models tailored to the characteristics of the material.

Teachers who answered 'never' to the items regarding providing interaction variations for complex material (item 2) and concretizing abstract material (item 3) explained the following causal factors: (1) all the material felt difficult for their students, (2) most students in their school had difficulty reading and writing, and (3) there was limited availability of learning media that supported Indonesian language learning, such as picture media and recording devices.

Further investigation reveals that the students' difficulty in reading and writing can be attributed to the disruption of learning in elementary schools during the COVID-19 pandemic. This disruption resulted in a learning lag, persisting and carrying over into their junior high school years. The challenges contributing to this learning lag during the pandemic include limited technological facilities and insufficient human resources, including teachers (Mailizar et al., 2020; Martina et al., 2022). This is because teachers continue to play a crucial role in the learning process, even during the pandemic (Ginting et al., 2022). The use of limited technology at lower levels of education makes an online learning particularly vulnerable (Portillo et al., 2020). Schools with limited or no experience in online learning and those that have not prepared adequate online resources face significant challenges. This is especially true when teachers lack the knowledge to effectively use online applications (Zaharah et al., 2020).

E. Technological Content Knowledge (TCK)

Data on the TCK level, which refers to knowledge of how technology can create a new perspective on certain material, as applied by teachers, is presented in Table 6.

TABLE 6
LEVEL OF TECHNOLOGICAL CONTENT KNOWLEDGE OF INDONESIAN LANGUAGE TEACHERS

States	Percentage			
	Always	Often	Seldom	Never
Teachers use appropriate ICT-based tools to improve students' reading skills.	17.9 40	23.2 52	25.4 57	33.5 75
Teachers use appropriate ICT-based tools to improve students' listening skills.	23.7 53	26.8 60	27.7 62	21.8 49
Teachers use appropriate ICT-based tools to improve students' viewing skills.	20.5 46	18.8 42	29 65	22.7 51
Teachers use appropriate ICT-based tools to improve students' speaking skills.	15.1 34	18.8 42	22.8 51	43.3 97
Teachers use appropriate ICT-based tools to improve students' writing skills	13.4 30	19.6 44	25 56	42 94

Regarding the first item, fewer than 50% of teachers reported using ICT in reading instruction ‘always’ or ‘often’. The factors supporting the use of ICT in reading lessons include: (1) the availability of ICT devices to present theories on the characteristics of the texts being studied, (2) the availability of ICT devices to present texts for students to read, and (3) the presence of instructional materials related to the texts on YouTube. Teachers who ‘seldom’ used ICT explained that ICT devices (LCDs) were primarily used to display theories on the characteristics of specific texts downloaded from YouTube, while the texts for students to read were sourced from textbooks or other printed materials. Meanwhile, teachers who ‘never’ used ICT provided the following reasons: (1) the availability of ICT devices (LCDs) in schools was very limited, (2) the texts read by students were considered more suitable in written form rather than as slide shows, and (3) the texts for students to read were already available in their textbooks.

Concerning the second item, the majority of teachers reported using ICT devices for listening, such as (1) radios and/or cell phones for listening to spoken texts, with or without speakers, and (2) YouTube videos as listening material for story/fairy tale texts. Some teachers used ICT devices to present theories about texts rather than listening materials. Teachers who responded ‘never’ highlighted the following reasons: (1) there were no devices necessary for listening activities, such as radios and speakers, and (2) they did not have a smartphone suitable for listening to audio materials.

For the third item, the majority of teachers reported using ICT devices. All of them stated that they used LCDs, while a small number also used both LCDs and smart TVs to present videos, either directly from YouTube or pre-downloaded. Additionally, some teachers instructed students to use smartphones to access materials or videos by scanning the barcodes provided.

Dealing with the fourth item, more than 50% of teachers stated they used ICT devices in speaking. They mentioned some purposes of using the ICT devices: (1) showing a model of people speaking, such as delivering a speech or telling a story through audiovisual media like YouTube or television videos, (2) playing examples of storytelling audio through radio or mobile phones, and (3) asking students to send their writings through a WhatsApp group. Meanwhile, teachers who responded ‘never’ detailed their approach to speaking learning, including (1) the teacher acting as a speaking model, such as demonstrating how to deliver a speech, (2) asking students to act as models, like demonstrating a dialogue, and (3) not providing examples of speaking demonstrations.

For the fifth item, less than 40% of teachers reported using ICT in teaching writing. Their ICT uses include (1) showing videos or images, (2) using LCDs or smart TVs, (3) using smartphones to access video materials by scanning the barcode provided by teachers, and (4) asking students to send their writings via a WhatsApp group.

Based on the explanation above, it can be concluded that the main factor hindering the majority of teachers from utilizing ICT devices in teaching reading, listening, viewing, speaking, and writing is the lack of supporting facilities, such as adequate internet access and basic learning devices like LCDs. Meanwhile, some schools prohibit students from using mobile phones or smartphones for learning. This creates a contradiction, as most teachers report being competent in utilizing ICT-based devices, yet this competence is not effectively applied in practice. This situation inevitably hampers the learning process. Therefore, it is recommended that stakeholders provide support in the form of facilities for these schools (Taopan et al., 2020).

Limited ICT facilities also trigger misconceptions in the learning process. These misconceptions appear in various learning activities, (1) in listening learning, materials provided are often in the form of written text or audio-visual displays instead of actual audio materials, (2) in viewing learning, the stimuli are typically written texts rather than engaging audio-visual materials, and (3) in language skills learning (reading, listening, speaking, and writing), the material presented is often theoretical. This conceptual error is likely to occur among teachers who have limited knowledge of integrating various ICT-based devices into learning. In fact, prior research has shown a significant positive relationship between the availability of facilities, teacher knowledge, and teaching quality (Haron et al., 2021).

F. Technological Pedagogical Knowledge (TPK)

Teacher responses on TPK components, which refer to their knowledge of how various technologies can be integrated into teaching and how these technologies can transform the way teachers teach, are presented in Table 7.

TABLE 7
LEVEL OF TECHNOLOGICAL PEDAGOGICAL KNOWLEDGE OF INDONESIAN LANGUAGE TEACHERS

States	Percentage			
	Always	Often	Seldom	Never
Teachers use ICT-based devices throughout the delivery of all Indonesian language learning materials.	11.1 25	30 67	31.3 70	27.6 62
Teachers use ICT-based devices in conducting learning assessments.	9.8 22	27.7 62	24.5 55	38 85
Teachers teach by implementing a variety of ICT-based devices to optimize learning interactions (teacher-student-material)	4.9 11	29 65	29 65	37.1 83

In the first item, less than 50% of teachers reported actively using technology to present learning materials. The supporting factors include (1) the availability of technology-based facilities such as language labs, smart classrooms, and podcasts at school, (2) reliable internet access at school, and (3) the presence of textbook materials accessed using barcode

scanning. Teachers ‘seldom’ or ‘never’ applied ICT because of some reasons: (1) most technology-based devices, such as LCDs and tape recorders, were broken, (2) the internet access at school was poor, (3) students were not permitted to use smartphones in class, and (4) teachers did not understand the way to operate technology-based devices.

For the second item, the majority of teachers were less or not active using technology for assessments. Those who responded ‘always’ and ‘often’ explained that (1) assessments were conducted using *Google Forms* or *Quizizz*, (2) students completed assessments either in class or at home, and (3) project assignments, such as speaking and writing tasks, were submitted via smartphones. Teachers who responded ‘seldom’ stated that technology was mainly used for submitting student writing assignments and other projects, such as speaking recordings, through smartphones. Meanwhile, those who responded ‘never’ lacked mastery in using communication technology devices, including learning assessment applications.

Related to the third item, the majority of teachers ‘seldom’ or ‘never’ used technology-based devices for teaching. They admitted that the challenges in using technology-based devices for teaching were due to: (1) the limited availability of these devices, which were prioritized for subjects like Natural Sciences and Mathematics, (2) a ban on students bringing smartphones to class, (3) poor internet access at school, and (4) a lack of mastery in operating technology-based devices.

Regarding the use of communication technology in learning, all ‘always’ and ‘often’ responses (items 1, 2, and 3) came from teachers at private schools, while the ‘seldom’ and ‘never’ responses were primarily from public school teachers. This suggests that, in terms of both facilities and human resource readiness, private schools are better equipped than public schools. This can be linked to the finding that in Indonesia, private schools are striving to outperform public schools to attract public interest by offering better infrastructure and teachers, enabling them to compete with public schools (Ibrohim et al., 2022). Other research also indicates that, while not all private schools are more advanced, some private schools indeed can compete with public schools (Martono et al., 2020). The phenomenon of private schools being superior as a result of competition with public schools is also evident in various countries (McKinnon et al., 2013). This situation is closely tied to the development of facilities and the TPACK competencies of teachers. It aligns with findings that teachers and students in rural areas are not yet fully prepared to utilize technology in learning (Wuryaningtyas & Setyaningsih, 2020). This fact can be linked to data from the Central Bureau of Statistics (2021), indicating that among the 5-24 age group (school age), only around 53.06% of students can utilize the internet. However, internet usage is much higher in urban areas at 77.36%, compared to rural areas. These data specify that the use of computers and the internet has not been fully mastered by teachers and students, particularly in rural areas.

G. Technological Pedagogical and Content Knowledge (TPACK)

Data on the implementation of the TPACK framework are presented in Table 8.

TABLE 8
LEVELS OF TPACK IMPLEMENTATION

States	Percentage			
	Always	Often	Seldom	Never
Teachers use ICT across all stages of the learning process—at the beginning, core, and end—with various learning activities through digital platforms.	0	0	0	100
Teachers combine available learning platforms with self-developed ones.	0	0	0	100

Table 8 shows that no Indonesian language teachers in rural areas have implemented the TPACK framework. Interview results revealed two main contributing factors: (1) the absence of a digital-based Indonesian language learning platform accessible to teachers in rural areas and (2) the limitations of ICT-based devices and inadequate internet access, which hinder the provision of digital learning platforms.

This fact highlights that the implementation of TPACK in rural schools has yet to reach an ideal level. Similar findings have been reported in studies on the application of the TPACK framework conducted by Bustamante (2020), Young et al. (2019) in the United States, Chaemchay (2017) in Thailand, and Li (2025) in China. The results reveal a significant gap in the quality and quantity of TPACK implementation among rural teachers compared to teachers in urban areas. Shambare and Cita's (2024) study shows that there are deficiencies in the TPACK competencies of life sciences teachers in rural areas of South Africa, especially in technology knowledge (TK), technology pedagogy knowledge (TPK), and overall TPACK proficiency. Kormos and Wisdom's (2018) study, which investigated the role of internet access in achieving educational equality in rural areas, noted that internet access is a critical factor in the context of TPACK. It enables teachers and students to access technology and digital resources to support more varied and relevant learning experiences. However, the availability of these facilities in rural areas lags significantly behind that in urban areas. These findings suggest that while the TPACK framework is an educational necessity in both urban and rural areas, a gap in available facilities hinders its implementation. This delays rural teachers from developing their TPACK and limits the potential for effectively integrating technology into the learning process in rural areas.

V. CONCLUSION

This study concludes that the application of the TPACK framework is an educational necessity in both urban and rural

areas. However, a significant gap in facilities exists. This situation hampers rural teachers from developing their TPACK and restricts the opportunity to effectively integrate technology into the learning process in these areas.

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