UTILIZING TPACK FRAMEWORK IN ENGLISH LANGUAGE INSTRUCTION FOR HIGH SCHOOL STUDENTS

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Abstract: This century's learning advancement relies on different information technology mediums. Thus, educators must improve their ICT skills to improve learning and academic performance. There are two main goals of this study: 1) to find out how TPACK is utilized in the process of teaching and learning; and 2) to find out what challenges English teachers encounter when applying the TPACK framework within their teaching. The type of study being done is qualitative. Observation and interview were some of the methods used to gather information for this study. This study examined XII IPA I in Senior High School 13 Makassar and an English

teacher. TPACK knowledge of English teacher comes from how well technology fits with their teaching methods and English subject knowledge. Technology lets the teacher apply several instructional strategies for several learning environments, based on the *Merdeka* Curriculum. Technology allows students to learn at their own pace and according to their choices. The English teacher utilized Quizizz or Google Classroom to handle assignments and provide timely feedback. Meanwhile, network service variability affects student engagement and learning equity. Because TPACK-based teaching depends on online resources, unreliable network connectivity limits availability. Also, web-based platforms, or multimedia materials need consistent internet access. Unreliable access to these tools during the class interfered with courses requiring live quizzes, direct assessments, or online group projects to help students grasp complex English knowledge. To overcome this challenge, institutions need to invest in technological resources and support teachers in adapting to various situations to effectively address these kinds of challenges.

Keywords: *English Class; High School; Language Instruction; TPACK; Technology;*

INTRODUCTION

The 21st century is the era of knowledge and technology development. Technology was first conceived as a technology environment, but it has become an ideal in the modern world that changes constructivist learning (Yusuf et al., 2015). This is because of the fast-moving world of technology. Technology, however, is making itself indispensable in all levels of education including the educational processes (Mairisiska et al., 2014). Accordingly, technological advances happen at breakneck speed and that impacts society including education (Carstens et al., 2021; Oke & Fernandes, 2020). Moreover, the progress of technology in our global society makes necessary more specific demands concerning what students should learn and teachers

their skills must acquire beyond basics. It can only make us ready to live in a dystopian society together with technology (Mårell-Olsson, 2021).

TPACK (Technological Pedagogical Content Knowledge) is the integration of a teaching model with technology in order to enhance classroom instruction (M. J. Koehler & Mishra, 2016; Mishra & Koehler, 2006). TPACK is a framework for good teaching with technology (Koehler & Mishra, 2009) and it involves the pedagogical delivery of content or material to students. Koehler et al. (2013) describe the interaction between three knowledge domains in detail:
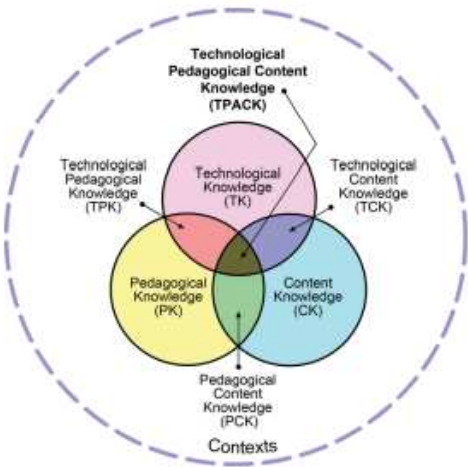

Figure 1. TPACK Structures and Knowledges Components

These three aspects of knowledge come together in a system that is designed to ensure they all contribute towards the overall picture. There is no one aspect dominating another (Rahmadi, 2019). The knowledge of the three parts should be mastered by teachers and effectively applied within their classroom learning process (Sutrisno, 2011). TPACK is a necessary framework for 21st century education as it includes the converging of three critical forms of knowledge: Content Knowledge, Pedagogical Knowledge and Technological Knowledge. In isolation, each component has worth but combined together is where TPACK becomes most salient. Content knowledge is what

teachers need to know about their subject, pedagogical knowledge involves the methods and strategies of teaching while technological proficiency covers technology tools and resources. This intersection being the key to good teaching, TPACK rather than looking at each of these areas in isolation. TPACK is manifested as six elements with the respective measures (Chuang & Ho, 2011; Churchill, 2020; Koehler et al., 2013; Shafie et al., 2019).

There are several important ingredients in the TPACK framework which come together to make for effective teaching provided it is technology-enhanced. TK: Technological Knowledge — This aspect of PCK focuses on the teacher's knowledge and understanding of the various technologies that can be used in teaching. For instance, skill topics can develop from how to design engaging learning media; use software such as Ms.Words for administrative purposes; search the web for resources and categorize them into manageable sections or making presentations in PowerPoint where content is organized. In turn, Pedagogical Knowledge (PK) refers to the teacher providing an understanding of how teaching and learning actually works which involves knowing when a learning model or strategy is appropriate along with effective approaches that can be used in instruction that matches educational purposes.

Content Knowledge (CK) extends this by stressing the need for teachers to know their subject — in other words, having good content knowledge will enable a teaching-covered understanding of that substance. Mastering this is essential to conduct clear, accurate and elaborate analysis. The framework also emphasizes Technological Content Knowledge (TCK), which refers to the teacher's ability not only to use technology in general but, more critically, as a medium for presenting content. Such six knowledges are demonstrated in the selection and implementation of technology-based media for making content more understandable, interesting to learners.

Furthermore, Technological Pedagogical Knowledge describes a teacher's dexterity at weaving technology into instructive strategies that advance students' comprehension. This can involve configuring erudite endeavours that harness technology as a contemplative

device, employing electronic assets for exploration, and utilizing diverse mechanical appliances to subsidize the learning process. Pedagogical Content Knowledge underscores the criticality of fusing pedagogical methods with subject mastery to heighten student elucidation. This may require employing similitudes to relate intricate theories to students' pre-existing comprehension or supplying tangible examples from everyday living to render immaterial notions more tactile. On the whole, the TPACK framework illustrates the intricate interplay between these components, accentuating that proficient teaching necessitates a harmonious fusion of technological, pedagogical, and content information to generate meaningful experiences of learning.

Incorporating TPACK permits instructors to design and execute instructive strategies that are both content-rich, pedagogically sound, and technologically adept (Rudolph, 2022). For example, a teacher who understands TPACK can leverage technology to enhance the learning of complex concepts rather than using it as a superficial addition. This integration helps create more engaging and interactive learning experiences, leading to improved student outcomes. When used appropriately, technology can facilitate personalized learning, foster collaboration, and provide access to a wealth of resources (McLoughlin & Lee, 2008). Still, it must be aligned with the content and pedagogical strategies to be truly effective (Grant & Basye, 2014).

Moreover, TPACK supports teachers in navigating the ever-evolving educational technology landscape. With constant advancements and new tools emerging, the ability to critically evaluate and integrate these technologies into teaching practices is essential. According to Tseng et al. (2022), TPACK encourages educators to think critically about how different technologies can meet diverse learning needs and enhance the teaching of specific content areas. This adaptability is crucial in preparing students for a future where technological literacy will be increasingly important. Overall, TPACK underscores the importance of a holistic approach to teaching that recognizes the interdependencies among content, pedagogy, and technology (Kale et al., 2020; McDougall & Phillips, 2024). TPACK

equips educators to create more effective and innovative learning environments by fostering a deep understanding of how these elements interact, ultimately benefiting student achievement and engagement.

In Indonesia education context, the *Merdeka* curriculum has been introduced to cultivate more individualized and flexible opportunities for learning, which correlates with the TPACK framework. First, the *Merdeka* framework emphasizes a learner-centred strategy that urges instructors to adjust their pedagogical tactics to satisfy the diverse requirements of their students. This adaptability is a core aspect of pedagogical expertise. Educators are inspired to utilize an assortment of instructive strategies and methods that address different studying designs and paces, advancing a more engaging and powerful learning environment (Halim et al., 2024). This pliability in instructive approaches aligns well with the TPACK design, as it necessitates educators to comprehend how to utilize pedagogical procedures to facilitate learning (Cahyati et al., 2024; Putriani, 2023).

Furthermore, the curriculum combines technology as a crucial learning factor, supporting technological proficiency. The *Merdeka* curriculum advances using computerized instruments and assets to improve teaching and studying experience (Habibi et al., 2020). For example, it urges employing multimedia, online assets, and instructional programming to back various parts of learning. This concentration on innovation enables instructors to include groundbreaking devices into their lessons, facilitating a more interactive and modern educational experience that aligns with the TPACK framework's emphasis on integrating technology effectively.

Lastly, the *Merdeka* curriculum inspires the integration of content expertise with both pedagogical and technological facets. It allows teachers to design curricula and evaluations pertinent to their student's needs and interests, cultivating a deeper comprehension of the subject matter. By endorsing project-based learning and real-world applications, the curriculum helps teachers connect the gap between content and pedagogy, guaranteeing that technology is used

purposefully to enhance content delivery and comprehension (Lestari, 2020; Nuraini et al., 2023).

Some scholars delved deeply into the execution of TPACK. Zhang and Chen (2022) performed the initial quantitative research. Information was accumulated through a questionnaire. This examination aimed to clarify the relationship between TPACK and affective and evaluative attitudes toward technology. The results of the quantitative review revealed sizable positive links between the SQD strategies and TPACK while considering the impact of general opinions toward technology. Their findings indicated that educators recognized the importance of the six techniques. However, the members highlighted that some tactics from the six are frequently not entirely used. Other examinations also explored the TPACK framework for powerful technology assimilation in teaching. Padmavathi (2017) stated that TPACK emphasizes the complicated interactions among content, pedagogical, and technological knowledge fields. TPACK guides academics in strategic decision-making regarding when, where, and how to use technology in instruction. The framework's acceptance mirrors its predecessor, Pedagogical Content Knowledge (PCK). Developing TPACK skills necessitates ongoing practice and integrating emerging technologies (Niess, 2018). Some researchers propose redefining TPACK as "TPACK-of-practice" to reflect better the dynamic nature of knowledge progression in teaching with technology, as stated in Keane (2020), Niess (2020), and Kennewell (2020). Preparing instructors with TPACK abilities presents obstacles, necessitating teacher educators' involvement and the restructuring of teacher training programs.

Despite the growing prominence of TPACK framework, there is still a room to improve especially in EFL context which may have particular cultural boundaries or under-resourced environments making it difficult for teachers meet their full potential. Previous research on this, mostly located in the developed world where technological devices have been used for a long time. However, there is scant literature discussing the potential of adapting TPACK for less

resourced contexts where infrastructure and technology-ways-of-being may vary culturally across social worlds. The limitations of the research currently examined suggest that a more in-depth qualitative follow-up investigation is needed to explore this gap and an essential area for further future works. Based on the background above, the researcher determines the problem statements as follows:

1. How is the implementation of TPACK in English learning?
2. What challenges do English teachers face in implementing TPACK in English learning?

METHOD
Research Design

This investigation employed a qualitative methodology with an illustrative structure to endorse the inquiry. As explained by Patton (2014), qualitative exploration is an attempt to appreciate circumstances in their singularity as a piece of a specific setting and the communications there. The use of a subjective illustrative approach in this study is justified by the need to address ongoing concerns and provide clear descriptions of data, helping to understand the phenomenon of integrating TPACK into English language instruction at Senior High School 13 Makassar.

Subject of the Study

The investigation into how teachers at Senior High School 13 in Makassar, Indonesia utilize technological pedagogical content knowledge illuminated practices within the classroom of one English instructor, Ms. R. This study was conducted in XII IPA 1 where it was provided a uniquely rich environment for analysing TPACK integration owing to the diverse array of technologies at the students' disposal, such as televisions, smartboards, and projectors. This setting was selected under the presumption that such technical resources could potentially magnify the teacher's ability to meaningfully fuse pedagogy with technology in a manner that benefits learning outcomes, as prior research has indicated.

Instruments

This study used classroom observation checklist and some questions in interview guide to further knowing about TPACK integration in class. Classroom observations checklist used to reveal the diverse ways of Ms.R integrated technology into English instruction, from leveraging learning management systems to facilitate discussion boards and assignments to utilizing smartboards and mobile apps to enliven lessons on grammar and literature. Follow-up, open-ended questions illuminated both the potentials and pitfalls experienced when attempting to synthesize technology, pedagogy, and subject matter knowledge. This is to gain further perspective on the dynamics of teaching and studying English amid technological incorporation, researchers also privately interviewed Ms. R to gather her reflections on leveraging equipment to enhance language acquisition in the classroom. By combining objective observations with open conversations, this dual research approach provided nuanced insights into how the TPACK framework was operationalized in EFL context and the multilayered support necessary for teachers to fully optimize educational technology.

Data Collection

Initially, researchers conducted 4 week-long observations XII IPA 1 class in Senior High School 13 Makassar. Researchers focused on technological applications and and student interactions. These observations were supplemented by in-depth, yet informal dialogues with the participating instructors, providing perspective on their approach to synchronizing technology within pedagogy. The conversations were audio recorded and carefully transcribed for systematic assessment and concentrating on issues encountered. This amalgam of observational checklist and interview transcripts not only enriched the comprehension of TPACK execution, but also permitted confirmation through cross-examination, strengthening the credibility and dependability of the conclusions. A variety of examination approaches helped achieve a nuanced appreciation of how educators incorporate technological, pedagogical, and content

material expertise into their English language lessons.

Data Analysis

Researchers started the process by carefully organizing the extensive observational notes from numerous classroom observations and interview transcripts, ensuring all materials were systematically coded. Leveraging qualitative analysis software, we employed open coding to break the data into more bite-sized, digestible segments, enabling us to recognize repeating themes related to the TPACK framework, such as how technology was successfully blended into lessons, pedagogical strategies witnessed, and observed levels of student participation. Following this initial round of coding, researchers conducted axial coding to explore interconnections between themes, particularly the ways certain technological tools molded instructional approaches and content conveyance. Researchers then brought together findings from watching classes and speaking with teachers to reinforce the robustness of their analysis. This comprehensive analytical process not only illuminated both the strengths and difficulties encountered by educators in applying the TPACK framework but also offered tangible insights for boosting English language instruction through strategic technology integration.

RESULTS

Implementing the TPACK framework in English classrooms has shown potential to enhance instruction and engagement. At the intersection of technology, teaching methods, and subject matter expertise lies opportunities to build immersive educational experiences. Nonetheless, studies uncovered specific shortcomings experienced by practitioners seeking to actualize TPACK. The following exposition provides deeper insight into both benefits and barriers of the approach.

Implementation of TPACK in English Learning

The observations below explore the amalgamation of TPACK in the pedagogical tactics of class XII IPA 1 at Senior High School 13 Makassar. Through meticulous monitoring, researchers scrutinized how

instructors synthesized content knowledge (CK), pedagogical knowledge (PK), and technology knowledge (TK) to nurture an enriching learning setting. This investigation centred primarily on monitoring the interplay between teachers and students, the application of technology in imparting content, and the educational approaches employed. The findings aim to furnish insights into the effective implementation of TPACK elements, highlighting their impact on methodologies of teaching and student involvement in a secondary academic environment.

Table 1. Components of Technological Knowledge

TPACK	Components	Indicators Definition
Technological Knowledge (TK)	The teacher's ability to comprehend and utilize technology in teaching	1. Using applications 2. Understanding and being able to access the internet 3. Presenting teaching material in PowerPoint format.

Ms. R commonly presented teaching material in PowerPoint format. Occasionally she lectured without any visual aids, engaging students through lively discussion. This multifaceted approach helps structure lessons in an organized manner and makes it easier to present complex information clearly and effectively. Using PowerPoint, Ms. R could highlight key points, embed multimedia, and provide a dynamic classroom experience. In summary, Ms. R effectively utilized technological knowledge to enhance educational delivery. Technology integration facilitates a more interactive and fruitful learning environment, aligning with modern academic standards and practices. For this, through interview session, the researchers asked,

Researchers : "Can you give examples of specific technology tools or apps you use and how they support teaching English content?"

Ms. R : "I think I go with Quizziz and Kahoot recently. If it is related to the content, yaa.. I mostly go with YouTube. But I make my own videos, two or

three times. I put them in Gdrive and send the link to the students via WhatsappGroup"

Researchers : "Can you mention some medias or applications you often use?"

Ms. R : "I go with the free ones. I always use Youtube or PowerPoint when deliver my materials. For exercises, I use google form or Kahoot or Quizziz. It all depends from the content on that day"

Table 2. Components of Pedagogical Knowledge

TPACK	Components	Indicators Definition
Pedagogical Knowledge (PK)	The teacher's ability in teaching and learning process.	1. Understanding in applying appropriate learning models in teaching. 2. Understanding and applying appropriate learning strategies in teaching 3. Knowledge of applying appropriate teaching methods.

Ms. R displays a strong grasp of selecting fitting pedagogical paradigms. She has proven adept at implementing varied systems like flipped classrooms, cooperative learning modules, and individualized instruction based on her students' traits. This dexterity ensures each student receives tailored education to optimize participation and comprehension, cultivating an atmosphere where scholars can flourish intellectually and socially. Regarding applying suitable studying tactics, Ms. R incorporated diverse techniques to accommodate various learning styles and preferences. Strategies like visual organizers, peer teaching, and self-evaluation are routinely employed to assist students comprehend intricate linguistic notions and better their language abilities. This promotes autonomy in learning and prompts students to take more accountability for their educational journey.

In closing, the comprehension and application of appropriate instructional methods are evident in her skills. She frequently leverages

direct instruction, inquiry-based studying, and contextual teaching approaches. In doing so, she guarantees lessons are both informative and contextually pertinent, which significantly aids in sustaining learner interest and motivation. Overall, the English teacher of XII IPA 1 at Senior High School 13 Makassar skilfully wields her educational knowledge to enhance the studying experience. By employing suitable models, strategies, and methods, she generates a dynamic and supportive learning environment conducive to teaching and learning, aligned with contemporary educational aims and learner needs. In interview session, the researchers asked about how the teacher integrate her material to technology:

Researchers	: "How do you integrate technology into your English lessons to enhance students learning?"
Ms. R	: "I do involve technology in my class, since the facilities are there. Mostly in XII classes where they got the facilities and can be connected to my laptop and internet connections.
	Nowadays, since it is English lesson, sometimes we need digital dictionary. Students use their phone to find the meanings. And for me, I provide exercise part through Quizziz or other applications, of course via internet"
Researchers	: "For how long have you applied it?"
Ms. R	: "Actually, since 2018. That was the very verst time when I taught here. After that, we encountered covid. At that time, I used WAG to give instructions. Now, because I adapt to it, it is much easier. I use some live applications, making it more fun in class"
	"A year later, the use of GoogleForm was quite booming for us as a teacher. Every teacher had to use this application for final semester. So, since then, we are so familiar with GoogleForm."

Table 3. Components of Content Knowledge

TPACK	Components	Indicators Definition
Content Knowledge (CK)	The teacher's ability to master the learning material that will be taught to students.	1. Mastery of the taught learning material.

Ms. R exhibits an exceptional command of their subject matter, delivering even intricate concepts with clarity and poise. Such profound erudition enables insightful responses to student inquiries, nuanced explanations, and diverse viewpoints on topics. This scholarly acumen strengthens their credibility and nurtures an enriching environment where curiosity thrives. Yet mastery is mutable; teachers consistently update their knowledge to track new progress in language pedagogy. Participation in professional growth, be it workshops organized by the school, webinars offered free of charge, or seminars occasioned by local administrations, ensures instruction aligns with evolving standards and practices.

Furthermore, Ms. R's extensive expertise facilitates interdisciplinary links, helping students see English's pertinence in fields like literature, history, or the sciences. This perspective cultivates a more holistic comprehension of the language and its applications. Ms. R adroitly applies their erudition to enhance learning. Their profound understanding and continuous refinement of the subject not only bolsters teaching efficacy but meaningfully impacts students' educational experience.

Researchers	: "Can you describe a successful lesson or activity where technology played a significant role in improving student engagement and understanding?"
Ms. R	: "Hmm..I would say the use of Quizziz. Since we witness how enthusiastic the students to answer the questions. How they are very engaged at class when doing the exercises. And seeing them like that, I think I am very pleased as a teacher".
Researchers	: "What training or professional development have you undergone to effectively integrate technology in your teaching?
Ms. R	: "Because I am interested in technology, when we are asked to join the seminar, I will choose the seminar that related to technology for teachers. I think it is a must for teacher to join such things"

Table 4. Components of Technological Content Knowledge

TPACK	Components	Indicators Definition
Technological Content Knowledge (TCK)	Teacher's ability to utilize technology to present learning material.	1. Selecting the appropriate technology-based learning media when presenting learning materials. 2. Using appropriate technology-based learning media when presenting learning materials.

When thoughtfully choosing appropriate technology-enhanced learning tools, Ms. R demonstrated adept discernment to select methods best aligning with lesson substance and objectives. For instance, interactive digital storybooks engaged students with rich content for literature, like integrated videos and quizzes. Alternatively, specialized language programs guided grammar with immediate feedback on drills, cultivating customized growth. Previously, she organized her material using preparatory exams. At that moment, the class divided into groups. MS. R exhibited famous figures for teachers to interpret skills. Throughout observation, students appeared assured, enthused and absorbed.

In wielding these choices, Ms. R exhibited deft proficiency. Seamlessly, technologies wove through teachings, ensuring accent on learning rather than technology. This involved ready setup and management during lessons, swiftly solving issues to maintain flow, leveraging tools to bolster comprehension and retention. Additionally, Ms. R tailored use considering diverse paces and styles, guaranteeing benefits for all. By aligning technology with goals, a dynamic, engaging setting cultivated participation and richer language immersion. In summary, Ms. R capably employed technological knowledge selecting most appropriate media. Thoughtful integration enriched experiences

and readied students for digital worlds. Take a look at the bit of Ms.R when explaining the involvement of technology related to her material.

> Ms. R: "And also, another involvement of technology in my class is there is a program on TV from the government in TVRI…. I forgot the name. Something like *smart*… It is a program for XI grader in which there is a schedule for two or three times a week where we need to watch it together in the class. Jin their zoom link for the explanation for particular subject"

Table 5. Components of Technological Pedagogical Knowledge

TPACK	Components	Indicators Definition
Technological Pedagogical Knowledge (TPK)	The teacher's ability to teach a series of learning materials using strategies that facilitate students' understanding of the learning material.	1. Learning activities using technology as a cognitive tool. 2. Utilization of technology in searching for references 3. Technology devices as supports in the learning process.

First, the insightful English teacher Ms. R ingeniously fused technology into her lessons to stimulate intellectual growth. For example, she employs digital conceptual maps to assist students in systematizing their thoughts and ideas regarding literary motifs or plotlines. This deepens comprehension while cultivating critical reasoning and imagination, allowing students to explore and expand knowledge independently. Regarding using technology for finding references, Ms. R guides students skillfully tapping online databases, electronic libraries, and scholarly search engines to amass dependable, academic information. This practice buttresses their research assignments and imparts crucial digital expertise, such as judging sources and combining information vital in our digital era.

Moreover, devices are incorporated to back the learning process. Tools including televisions, projectors, and smartboards are utilized to access information and facilitate collaborative learning through

applications like Google Classroom, where students can work on projects together, share understandings, and offer peer feedback in real time. This collaborative environment, supported by technology, fosters an interactive and engaged learning atmosphere conducive to deeper learning. In conclusion, the perceptive Ms. R adeptly employed her technological pedagogical knowledge to enhance educational outcomes. By weaving technology into the curriculum as an instrument for intellectual development, a means for academic research, and a collaborative learning facilitator, she effectively leverages the potential of digital tools to enrich the learning experience for her students.

Table 6. Components of Pedagogical Content Knowledge

TPACK	Components	Indicators Definition
Pedagogical Content Knowledge (PCK)	The teacher's ability to teach a series of materials using strategies that facilitate students' understanding of the learning material.	1. The use of analogies in learning 2. Providing concrete examples from everyday life to make the material easily understood.

Ms. R skilfully employed comparisons to clarify intricate linguistic constructions and literary notions. She facilitates a deeper comprehension of difficult subjects by drawing parallels between new ideas and her students' existing awareness. For instance, explaining the arrangement of English sentences using the comparison of building blocks can help learners visualize and grasp grammatical structures more productively. This approach simplifies the acquisition and renders the theoretical substance more tangible.

Furthermore, Ms. R is proficient in offering concrete examples from everyday life to elucidate the learning materials. This practice involves linking lesson ideas straight to familiar contexts, rendering the data more accessible and meaningful. For example, when instructing idiomatic expressions, instructors might employ scenarios that students come across daily, such as expressions employed in local markets or during school activities, hence grounding their studying in real-world applications. These methods demonstrate the teachers' strong command over pedagogical strategies and content knowledge and significantly

enhance student involvement and retention of substance. By employing comparisons and real-life examples, Ms. R generates an educational and relatable learning environment, ensuring that students can see the practical worth and applicability of their lessons. In summary, Ms. R expertly blends their pedagogical abilities with their content knowledge to render studying more accessible and engaging. Their use of comparisons and real-life examples is crucial in breaking down intricate notions and connecting the curriculum to the student's everyday experiences.

Research demonstrates multimedia tools significantly boost linguistic proficiency. Videos, podcasts, and e-books expose students to authentic usage in diverse contexts, enriching vocabulary and comprehension. Digital feedback on writing further strengthens skills by highlighting errors for personal improvement.

TPACK allows more tailored teaching for varied abilities. Adaptive programs individualize based on performance, challenging all learners appropriately through personalized paths. Teachers implement differentiated instruction more seamlessly across proficiency levels and paces.

Challenges for English Teachers in Implementing TPACK in English Learning

Nonetheless, despite its advantages, embracing TPACK in EFL context also introduces unique tests. In numerous occasions, there necessitates to be greater satisfactory apparatus, like computers, tablets, and smartboards, which restricts teachers' capacity to utilize computerized assets and instruments. In Senior High School 13 Makassar, some classes are facilitated by smartboards, projectors, and TVs. This school got ten units of smartboards from the nearby government a year prior (2023). Nonetheless, not all classes are outfitted with keen smartboards because of this limitation. With smartboards, teachers may have the option to utilize conventional strategies for guidance, similar to discourses and static handouts, which can hinder the dynamic coordination of innovation. This limitation influences their capacity to utilize cutting edge educational methodologies that exploit computerized instruments for progressively dynamic and engaging exercises. Here is the interview with Ms.R about this matter.

Researcher	: "Have you encountered any challenges or barriers when implementing technology in your English classes? How have you overcome them?"
Ms. R	: "Of course. The very first thing is not all of the classes equipped with projectors, or TV. Even sometimes, we got the technical stuff. From the students' side, they do owning the phone, but one or two students sometimes got trouble with theirs. Also, 5-10% of students got no internet connections. The solution sometimes I give is to ask their friends to share their hotspot for 15-2-minutes."
	Researchers : "Is there a Wifi?"
Ms. R	: "There is. But mostly the Wifi is for the teacher. And sometimes it is not working that good. Only in some specific areas got good connections."

While inequitable access to intelligent boards risks exacerbating the digital divide between students, we must acknowledge the potential positive impacts of technology-integrated education when properly implemented. The TPACK framework advocates for accessible and equitable technology use to provide all learners with a consistent educational experience. However, achieving this vision requires overcoming real obstacles, such as unreliable internet connectivity at Senior High School 13 Makassar. Inconsistent network access undermines efforts to seamlessly integrate technology, pedagogy, and content knowledge as envisioned by TPACK. With unstable connectivity, lessons struggle to fully utilize online resources, digital tools, and collaborative platforms in support of diverse student needs. Some activities are disrupted or rendered impossible when the internet falters. For technology to truly enhance instruction as outlined in TPACK, it is imperative that internet reliability supports flexible and robust pedagogical strategies and content delivery. Access without dependability limits technology's potential to meaningfully augment students' educational experiences.

DISCUSSION

Implementing TPACK in English learning likewise introduces difficulties linked to syllabus and time constraints. English curriculums

are often densely packed with numerous goals instructors must cover within constrained instructional intervals. Integrating technology necessitates mindful preparation and design of lessons, which can be time-devouring. Teachers may require aid balancing the demands of covering the mandated content while incorporating technological instruments and actions. Furthermore, standardized assessing and rigid curriculum guidelines can curb teachers' flexibility to experiment with innovative technological approaches. The stress to meet syllabus benchmarks and ready students for exams can discourage instructors from investing time in developing technology-enhanced lessons (Fishman et al., 2016), even if they recognize the potential advantages (Atherton, 2018).

Within the setting of Senior High School 13 Makassar, unreliable internet can lead to various issues, such as interruptions during online research, troubles accessing educational platforms, and challenges in enacting real-time collaborative initiatives. For example, activities that rely on web-based instruments for research, multimedia presentations, or virtual discussions become problematic when internet access is sporadic. This impacts the immediate learning experience and the teacher's capacity to deliver consistent, technology-enhanced instruction aligned with the TPACK framework. The theory of technology integration also underscores the importance of equitable access to digital resources. Inconsistent internet access generates a disparity in learning experiences among students, as those with reliable internet access can benefit more from technology-enhanced learning activities than those without. This digital divide exacerbates educational inequities, affecting the inclusiveness and effectiveness of technology integration in the classroom. Dalal, et al. (2017) argued that The TPACK framework advocates for an environment where technology is a dependable tool that supports all students equally, making consistent internet access crucial for achieving this goal.

Additionally, at Senior High School 13 Makassar, the limited availability of internet data among students presents a significant challenge to effectively utilizing the Technological Pedagogical Content Knowledge (TPACK) framework. The complex framework emphasizes

creatively integrating technology, nuanced pedagogy, and rich content knowledge to transform teaching and learning experiences. However, when students have restricted access to data on the internet, this framework's practical application could be strengthened, affecting the overall educational results. The intricate TPACK framework establishes that effective technology integration involves the teacher's ability to innovatively incorporate digital tools into their multifaceted pedagogy and the student's capacity to deeply engage with these tools. Constrained data internet access restricts students' ability to fully participate in online activities, access digital resources, and engage in technology-enhanced learning experiences that stimulate deeper understanding. For instance, if students cannot use online platforms for collaborative projects requiring complex thinking, extensive research, or multimedia presentations highlighting different perspectives due to limited data, they miss out on valuable opportunities that align with the technological components of the intricate TPACK framework.

Moreover, the limited data internet access affects the execution of technology-integrated pedagogical strategies crucial for modern education. For example, suppose a teacher creatively designs a lesson incorporating online quizzes necessitating complex thought, interactive simulations cultivating rich discussions, or digital collaboration tools facilitating diverse ideas. In that case, students with restricted data access may need assistance to complete these activities, leading to gaps in learning and engagement that inhibit their development. This limitation forces teachers to revert to less technology-intensive methods, which may not fully align with the innovative approaches advocated by the intricate TPACK framework.

Another significant challenge is the need for continuous professional development and technological proficiency among English teachers. The intricate TPACK framework requires teachers to understand how to integratively and innovatively incorporate technology with pedagogy and content knowledge effectively. However, many teachers may need more training or confidence to use advanced technological tools that cultivate richer learning experiences. Professional development programs often need to catch up with rapid

technological advancements, leaving teachers struggling to stay updated (Lawless & Pellegrino, 2007; Sparks, 2002). Moreover, these programs may need to be more tailored to the specific needs of English teachers, focusing more on general technology use rather than subject-specific applications that could deeply engage students. As a result, teachers may feel overwhelmed or underprepared to meaningfully incorporate technology into their English lessons in a way that stimulates students' development.

CONCLUSION

Implementing TPACK in English learning depends heavily on institutional support and a conducive policy framework. Without solid backing from educational authorities, it faces logistical and capability challenges to integrate technology into classrooms. Schools must provide ongoing funding, professional development, technical assistance, and a culture that promotes experimentation. Policies should clearly guide the effective application of tech for teaching and learning.

The Indonesian *Merdeka* curriculum exemplifies TPACK's balanced integration of content, pedagogy, and technology. This holistic approach ensures educators design meaningful and compelling experiences leveraging each component. While TPACK offers a comprehensive method, implementation presents English teachers' numerous obstacles. Overcoming barriers demands a multifaceted strategy including improved access, targeted training, curriculum flexibility, diverse learner support, innovative assessment, and strong institutional commitment. Only through addressing issues can TPACK's full potential enhance English education.

In conclusion, the lack of smartboards in schools creates a considerable impediment to applying TPACK successfully. The model stresses combining technology, pedagogy and content knowledge to boost learning. However, with smartboards, English teachers could provide innovative, interactive and inclusive instruction. To vanquish this challenge, institutions must invest in technological resources, or even assist teachers adapting themselves in every possible situations solving this kind of challenges.

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