Bridging Technological Gaps in Primary English Teaching: Insights from Indonesian Student Teachers

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Abstract: The effect of technological advancements on teaching and learning prompts their implementation into classrooms. Integration in specific school contexts, however, remains difficult, especially in resource-constrained situations. This research explores student teachers' insights into handling technological restrictions during their teaching practicum experiences. Data were gathered through semi-structured interviews emphasizing their attitudes and strategies for using technology in primary English language classes. A theme analysis revealed that student teachers are aware of the importance of technology in improving learner engagement and motivation. Yet, they experience considerable practical challenges, such as restricted access to digital tools and infrastructure. Despite these limits, the students exhibited their resourcefulness and adaptability by using low-cost alternatives such as cell phones, printed materials, and interactive non-digital activities. Based on the findings, teacher education programs should give more practical and context-sensitive training to prepare future educators for effective technology integration, even in low-resource situations. It is recommended that Indonesian education policymakers examine local school situations when allocating technological resources, as well as strengthen teacher training activities. Furthermore, fostering school-community collaboration and encouraging innovative teaching techniques will help improve technology integration in primary English schools and provide equal learning opportunities for all learners.

Key words: Technology Integration, Perception, TEYL Class, Primary English Teaching

INTRODUCTION

Technology is currently regarded as an essential component for developing 21st-century skills such as digital literacy, collaboration, and problem-solving (Weber & Greiff, 2023). Learning with technology has also been credited with improving student motivation and engagement through the use of interactive tools and more interesting and accessible multimedia content (Blyznyuk et al., 2025; Latifah et al., 2022). In the context of English language learning in primary school, various interactive platforms and learning applications have altered how students acquire and practice language skills (Tamilarasan et al., 2019; Yanwar et al., 2022). Simultaneously, teachers are encouraged to use creative teaching methods (Batallanos et al., 2019).

However, the benefits of technology in education face various challenges, including inadequate infrastructure and teacher competency (Dinçer, 2024; Ndungane et al., 2024). It requires policymakers and stakeholders to prepare infrastructure, as well as teachers to grow their professionalism for effective use of technology. To address this gap, a strategic concept is required. Teachers' competency development, should address both the technical and pedagogical levels (Riyanda et al., 2025).

Several studies have highlighted the opportunities and challenges of technology integration in education. Sari & Abrar (2024) found that technology in English language learning offers benefits like enhanced motivation, access to authentic materials, and personalized learning. Challenges include limited access, inadequate digital literacy, and a lack of pedagogical alignment. Moreover, the eclectic approach, combined with technology integration, develops adaptability in English language teaching (Harb & El Hajj, 2024).

On the other hand, teachers experience challenges in integrating technology into English instruction. As being emphasized in numerous studies, infrastructure restrictions and discrepancies in resource availability remain key barriers. Munje & Jita (2020) highlight the negative effects of insufficient ICT resources in South African primary schools, as resource disparities impede effective teaching and seamless integration of technology into classrooms. Similarly, Hoxha et al. (2020) cite insufficient technology access in Albanian schools as a hindrance to student involvement. They also point out that, despite these limits, creative use of current technology can significantly influence learning outcomes, highlighting its potential even in resource-constrained contexts. These findings emphasize the important need for fair access to technological resources in order to provide more uniform and powerful educational experiences across varied contexts.

Teacher readiness is another important aspect that influences technology integration in education. Insufficient training and digital literacy among educators impede the effective use of technology in the classroom. Blyznyuk et al. (2025) underline the importance of preparing teachers to integrate technology into innovative educational practices while also addressing the larger concerns of the digital divide and curriculum redesign. Hughes (2005) highlights the need for content-specific training, stating that effective technology integration requires teachers' understanding of how to align digital tools with subject-specific objectives. The studies emphasize the need of comprehensive professional development programs preparing teachers with skills demanded for employing technology.

In addition, curriculum adaptation is crucial for integrating instructional practices with technology improvements by considering pedagogical aspect and well planned training programs. Redmond & Lock (2019) underline the complexity of incorporating the Technological Pedagogical Content Knowledge (TPACK) framework, emphasizing the need for structured training and contextual application to prepare pre-service teachers for effective technology use. Similarly, Wajhah & Mohd Yusof (2024) find that student teachers in Lombok, Indonesia, are moderately prepared for technology integration, with problems such as insufficient digital resources, motivational barriers, and infrastructure issues. These studies emphasize the significance of adjusting curricula to not only address technology accessibility but also to include focused training that promotes preparedness, motivation, and practical application of digital tools in a variety of instructional scenarios.

Despite a growing recognition of technology's transformative potential in education, considerable research gaps persist. Existing research has generally focused on the benefits and problems of technology integration in broader educational contexts, with little study of its specific application in primary English language instruction, particularly in resource-constrained settings. While frameworks like TPACK and research on teacher readiness, e.g., (Blyznyuk et al., 2025; Redmond & Lock, 2019) provide useful insights, they frequently lack contextual specificity for localized difficulties such as those faced in rural schools. Furthermore, research frequently understates the varied demands of pre-service and in-

service teachers in managing motivational and infrastructural barriers to technology integration, creating a void in workable techniques that are consistent with their real-world limits and teaching practices.

This study introduces a new perspective by focusing on the relationship between teacher preparedness, curricular adaptability, and resource accessibility in the context of primary English teaching in Indonesia. The study bridges the gap between academic frameworks and practical implementation by assessing pre-service teachers' readiness and perspectives on integrating technology. Furthermore, it highlights a novel solution for dealing with both macro-level (policy and infrastructure) and micro-level (specific teacher abilities and motivation) difficulties. This specialized and strategic approach not only increases the understanding of technology's role in the basic English classrooms, but also delivers adaptable strategies suitable for similar learning environments around the world.

This study seeks to explore how technology is being used in primary English education, specifically the viewpoints and techniques of student teachers. It seeks to explore how student teachers perceive the role of technology in improving teaching methods, as well as the strategies they propose to overcome technological disparities, particularly in resource-constrained educational contexts. The study aims to identify actionable ways to overcome challenges and maximize the potential of technology in primary English classrooms by connecting theoretical frameworks with practical experiences. This study contributes to a better understanding of the problems and opportunities connected with technology integration, with implications for teacher education, curriculum development, and policy reform.

RESEARCH METHOD

Through a qualitative lens, this study explored the perspectives of student teachers in integrating technology into primary English teaching and their proposed strategies for addressing technological gaps. This study adopted a case study method to deliver an in-depth understanding of the specific experiences and practices of a small, focused group of student teachers whose classroom practices met the expectations outlined by their lecturer (Creswell, 2014).

The participants in this study were purposively selected based on the recommendation of the lecturer of TEYL course, who identified two student teachers whose teaching practices were conducted in different primary English class environments. They were selected to provide detailed insights into the processes, challenges, and strategies associated with their experiences in technology-enhanced teaching.

Qualitative data were collected through semi-structured interviews. The interviews aimed to gather detailed descriptions of their perspectives on the role of technology, the challenges they encountered, and the strategies they developed to address technological gaps. Participants were also asked to reflect on the trainings in the TEYL class and its impact on their ability in integrating technology into their teaching practices.

To guide meaningful exploration of teachers' experiences, the TPACK model (Koehler & Mishra, 2009), technology use theories, and context-specific challenges. It also addressed training experiences and sought insights into creative practices in low-tech settings, using qualitative principles.

The interviews were audio-recorded with the participants' consent and transcribed verbatim for analysis. The qualitative data were analyzed using thematic analysis. The researchers followed a systematic process of coding, categorizing, and identifying recurring themes and patterns, allowing for an in-depth exploration of the participants' experiences and strategies. This approach allowed the findings to be deeply grounded in the participants' insights while being contextualized within their specific teaching practices.

RESULTS AND DISCUSSION

Answering the research questions on how the student teachers incorporate technology in English instruction, how they view the roles of technology, and how they come up with the strategies dealing with technologies' barriers, the discussion is presented. The presence of technology in teaching, especially in a primary level context, is crucial as it is believed to help students learn in an interesting and meaningful way.

Today, the primary school students are surrounded by digital devices and media as they are claimed as digital natives. Therefore, language teaching needs to be tailored to their learning preferences and expectations (Wu, 2024). Integrating technology is no longer a luxury but a necessity to remain relevant and effective. Technology significantly offers various both pedagogical and content benefits (Vaghela, 2024). Through applications and multimedia (Fu & Yang, 2019; Tamilarasan et al., 2019), it enhances students' motivation and improves learning outcomes. However, several issues seem hinder the effective implementation of technology, including the limited infrastructure and teacher competencies.

The perspectives of student teachers on integrating technology in primary English teaching

The findings reveal that student teachers view technology as a helpful tool for improving English learning in elementary school. Its potential to increase learner involvement and motivation was among the most frequently cited. Similarly, Al. Kandari (2018) stated that digital tools were deemed especially useful in keeping young learners' attention throughout the class. The student teachers underlined the importance of using multimedia components, such as films, songs, and interactive games, in order to create a lively and interesting classroom environment. For example, student teacher A stated that technology helps to "boost students' attention, motivation, and comfort," whilst student teacher B highlighted that such tools make learning "more engaging, interactive, and effective." These reflections indicate that they are acutely aware of the motivational potential of well-integrated digital resources in early language learning.

The student teachers perceive technology as a critical component in improving the quality of primary English instruction. They believe digital resources like movies, music, and interactive games can boost student involvement, motivation, and attentiveness. These technologies make learning more relatable and enjoyable, meeting the different requirements of young students (Makarov et al., 2023). The TEYL course facilitates student teachers in incorporating technology creatively, emphasizing the use of even simple digital tools to enhance the learning experience. However, student teachers point out that technology should complement rather than overshadow traditional teaching methods and creativity.

In addition to involvement, student teachers agreed that technology plays a significant role in making language content more accessible and relevant (Wang, 2023). The utilization of audiovisual media and game-based applications was viewed as a means of transforming abstract language into meaningful and concrete learning opportunities. Student teacher A remarked how *"audio, video, and interactive games"* might make lectures more relevant to students' daily life. Similarly, student teacher B mentioned that *"even simple technologies can significantly enhance the learning experience,"* suggesting that the perceived worth of digital tools is not always related to their complexity, but rather to their relevance and adaptability for primary learners.

Despite acknowledging the promise of technology, student teachers indicated a balanced perspective on its use in the classroom (Rapanta et al., 2021). They emphasized that technology should not take over the learning process, but rather serve as a supplement to good pedagogical techniques. Student teacher A claimed that technology "should complement, not replace, an understanding of students' needs and teaching creativity." Similarly, student teacher B underlined the significance of matching digital tools to learner characteristics, arguing that their use is most effective when integrated into carefully planned, student-centered training. This viewpoint shows a knowledge that successful technology integration is dependent not only on the tools, but also on the teacher's ability to use them effectively (Josefsson et al., 2019; Shah, 2022).

Student teachers frequently face resource constraints that prevent technology integration in the classroom. Non-digital tactics, including storytelling, singing, gestures, and games, are used in these situations to keep students engaged. Their lack of access to advanced tools forces them to rely on basic resources such as printed materials, cell phones, and personal laptop computers. These problems underline the importance of innovative teaching methods and the adaptability of student teachers (Nancy et al., 2020).

The strategies of student teachers for addressing technological gaps

When presented with technical limits in the classroom, student teachers demonstrate remarkable adaptation and problem-solving skills. In resource-constrained settings, they do not see the lack of advanced technology as a barrier to successful education. Instead, they creatively use readily available and low-cost tools to give engaging English courses. Both student teachers displayed the capacity to switch to alternative tactics when technology was unavailable. For example, student teacher A cited the usage of printed materials, gestures, and traditional games as useful ways to keep students interested. Similarly, student teacher B depended on storytelling, singing, and printed exercises to help him learn. These solutions demonstrate that student teachers value the learning experience and are willing to adapt their methods to the realities of the classroom environment.

In terms of overcoming technology gaps, student teachers could present several cost-effective and practical alternatives (Angrist et al., 2022). Student teacher A highlighted the urge of using low-cost equipment like Bluetooth speakers, mobile phones, and digital documents that can be read offline. Moreover, student teacher B agreed, recommending the use of phones to establish hotspot connections or utilizing basic gadgets such as computers and projectors, which are often present in classrooms. These replies demonstrate an understanding of how to make the most of limited resources and optimize them for classroom use. Importantly, the student teachers do not associate technological integration

with the use of high-end equipment, but rather with the creative application of simple, readily available instruments.

Both student teachers emphasized the importance of teacher training in minimizing inequities in technology access. They feel that providing teachers with knowledge of adaptive, easy-to-use technologies is critical to long-term integration. Student teacher A proposed training programs on simple digital tools compatible with for the local conditions, whereas student teacher B suggested sessions on how to create interactive slides and effectively use educational apps. These ideas indicate a strong pedagogical orientation, emphasizing that technology should support educational purposes while also being practical in the teacher's everyday context (Leite & Lagstedt, 2021).

To solve technology shortcomings, student teachers presented several innovative and cost-effective solutions. Accessible tools, including Bluetooth speakers, mobile hotspots, and offline content downloads, are recommended. They call for schools to provide basic infrastructure such as projectors and audio speakers, as well as training programs that focus on practical uses of simple technologies (Biletska et al., 2021). By stressing adaptive and low-cost solutions, student teachers adopt a practical approach to navigate the digital divide in resource-constrained contexts

Furthermore, student teachers expanded their perspectives on larger educational issues. Student teacher A emphasized the need for systemic support, asking schools and policymakers to prioritize basic digital infrastructure, contextualize digital resources, and provide ongoing professional development for teachers. Student teacher B stressed the necessity of institutional assistance, providing access to essential tools such as audio speakers and projectors. These strategies reveal a comprehensive understanding of how to address digital inequality within educational and policy initiatives (Solehudin, 2024).

The TEYL course curriculum is critical in preparing student teachers to integrate technology into primary English teaching. The curriculum introduces students to innovative teaching approaches, such as incorporating digital games, films, and songs into courses. Furthermore, the course emphasizes the need to have backup plans and utilizing non-digital interactive tactics, enabling prospective teachers to adapt to diverse classroom settings. This preparation ensures that student teachers can effectively apply technology to learning despite limited infrastructure.

In addition, student teachers credited their TEYL courses with preparing them to manage the practical ways of integrating technology, particularly in typical classroom constraints. They agreed that the course had provided them with flexible tools for lesson planning and classroom management. Student teacher A emphasized the significance of *"backup plans"* and including *"icebreakers and games"* as alternatives in case of a technical failure. However, student teacher B also mentioned how the course provided *"creative strategies"* for using technology, pointing out the idea that flexibility and well-prepared are essential to effective integration. The findings indicate that student teachers value technology with the awareness of practical skills and contingency strategies dealing with classroom realities.

The findings clearly show the convergence of technological, pedagogical, and content knowledge (TPACK) among student teachers. They emphasize the use of technology (T) in pedagogical practices (P), such as employing videos, songs, games, and narrative to improve content delivery (C) in their practicum of the TEYL course. Student teachers understand that

effective teaching requires more than just having access to technology; it must also be effectively included in lesson design and aligned with the requirements of the learners. Their experiences are associated with the core principles of the TPACK framework, which emphasizes the role of technology in enhancing both instructional content and teaching methods.

CONCLUSION

The study demonstrates that the student teachers were literate and aware of the importance of technology integration in teaching. On the other hand, the absence of proper devices and infrastructure prevented them from implementing technology ideally. It advocates a reevaluation of present teacher education programs, which not only present new technology tools but also equip future teachers to adapt to low-resource environments. This study brings about insights for student teachers and relevant stakeholders. Efforts made by the student teachers are possibly adapted to cope with the technological gaps in primary English teaching. For schools, there is a need for more legislative assistance to provide basic infrastructure such as projectors, speakers, and dependable internet connectivity, particularly in low-income schools. Furthermore, the creation of localized digital resources that are curriculum-aligned and attentive to cultural and linguistic settings can considerably enhance effective teaching practices. Also, teacher education programs should include continual professional development focusing on advanced and practical uses of educational technology, ensuring that teachers are ready to adapt to changing classroom situations. Furthermore, collaborative learning models, such as peer-sharing platforms, might motivate teachers to share their digital tools and teaching practices. Future research may involve a larger and more diverse sample of pre-service and in-service teachers to explore how experiences vary across urban and rural settings, or among institutions with differing levels of technological support.

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