

The Integration of Digital Technology in English Language Teaching: A Study on IT-Based Innovation in Vocational High School, Kendari, Southeast Sulawesi

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ABSTRACT

The rapid advancement of digital technology has revolutionized English language teaching, yet its integration in Indonesian vocational secondary schools remains underexplored. This study examines the implementation of IT-based innovations in English language instruction at one of Vocational High School, Kendari, Southeast Sulawesi, focusing on 29 students in Grade XII TKJ class. Employing a mixed-methods quasi-experimental design, the research integrated quantitative pre- and post-tests with qualitative data from semi-structured interviews, classroom observations, and student questionnaires collected over one semester. Digital tools including Google Classroom, Canva for Education, Quizizz, and video-based authentic materials were systematically incorporated to enhance students' speaking, listening, reading, and writing skills. Results revealed a statistically significant improvement in overall English proficiency ($p < 0.05$), with post-test mean scores increasing by 28.4% compared to pre-test scores. Students reported higher motivation ($M = 4.21$, $SD = 0.67$ on a 5-point Likert scale) and greater engagement through interactive and collaborative digital activities. Qualitative findings highlighted improved learner autonomy and authentic language exposure, although challenges such as unstable internet connectivity and limited teacher digital competence persisted. This study concludes that strategic integration of IT-based innovations effectively enhances English language learning outcomes in vocational settings. The findings offer practical implications for English teachers and curriculum developers in similar Indonesian vocational high schools and contribute to the growing body of knowledge on technology-enhanced language teaching in developing contexts.

Keywords: Digital Technology Integration; English Language Teaching; IT-Based Innovation

INTRODUCTION

The rapid advancement of digital technology has fundamentally transformed the landscape of education worldwide, particularly in the field of English language teaching (ELT). In the 21st century, the integration of information and communication technology (ICT) has shifted traditional teacher-centered approaches toward more interactive, student-centered, and authentic learning experiences. Tools such as learning management systems, interactive applications, video conferencing platforms, and artificial intelligence-powered resources now enable learners to engage with English in real-world contexts, thereby enhancing their linguistic competence, motivation, and digital literacy simultaneously. This transformation is especially critical in an era where English serves as a global *lingua franca* essential for international communication, higher education, and workforce competitiveness.

In vocational secondary education, the demand for English proficiency is even more pronounced. Students in vocational high schools are prepared not only for academic continuation but primarily for direct entry into the professional world, where strong English communication skills combined with technical competencies are highly valued by industries. The integration of digital technology in ELT within these institutions offers unique opportunities to bridge the gap between classroom learning and workplace requirements. Interactive digital platforms can simulate real vocational scenarios, such as business meetings, technical presentations, or customer service interactions in English, making language learning more relevant and practical for students majoring in technology-related fields like Teknik Komputer dan Jaringan (TKJ).

Despite the promising potential, the integration of digital technology in English language teaching in Indonesian vocational schools still faces significant challenges. Many studies highlight issues such as inadequate infrastructure, unstable internet connectivity, limited digital competence among teachers, and unequal access to devices, particularly in regions outside Java. In vocational settings, these barriers are compounded by the need to align language instruction with specific technical curricula, often resulting in underutilization of available technologies. Consequently, English learning in many SMKs remains conventional, relying heavily on textbooks and rote memorization rather than innovative, technology-enhanced practices that could better prepare graduates for the digital economy.

Recent global trends in 2025–2026 further underscore the urgency of effective technology integration in ELT. The rise of generative artificial intelligence, multimodal learning resources, and immersive digital environments has accelerated the shift toward personalized and autonomous language learning. In developing countries like Indonesia, however, the adoption of these innovations in secondary education, especially vocational schools, lags behind due to resource constraints and insufficient teacher training. This disparity creates a critical need for localized

empirical studies that examine not only the benefits but also the practical implementation and contextual challenges of IT-based innovations in real classroom settings.

In the context of Southeast Sulawesi, vocational schools play a vital role in producing skilled human resources for regional development. The Sample school with one of its major is focused on technology and engineering programs, requires English instruction that equips students with both general language skills and occupation-specific communicative abilities. In the sample school, the XII TKJ class, consisting of 29 students specializing in computer and network engineering, represents a typical vocational cohort where digital tools are inherently part of their daily technical learning. Integrating IT-based innovations in their English lessons could therefore create synergistic effects between language acquisition and their core vocational competencies.

Nevertheless, research specifically addressing the integration of digital technology in English language teaching remains limited. While several national studies have explored ICT use in general high schools or urban vocational institutions, few have focused on technology-oriented classes in provincial vocational schools like those in Kendari. Existing literature often highlights broad challenges such as infrastructure limitations and teacher readiness without providing in-depth case analyses of actual implementation processes, student responses, and learning outcomes in specific classroom contexts.

This study seeks to fill this gap by investigating the implementation and impact of IT-based innovations in English language teaching for Grade XII TKJ students at the sample school. Over one semester, various digital tools including Google Classroom, interactive quiz applications, Canva for Education, and authentic video materials were systematically integrated into the teaching and learning process. The research employs a mixed-methods approach to capture both quantitative improvements in English proficiency and qualitative insights into student engagement, motivation, and perceived challenges.

The findings of this study are expected to provide valuable practical implications for English teachers, school administrators, and curriculum developers in similar vocational settings across Indonesia. By documenting both the successes and obstacles encountered in a real vocational classroom with 29 students, this research contributes to the growing body of knowledge on technology-enhanced language teaching in developing contexts. Ultimately, it aims to support the broader goal of improving English language education quality in Indonesian vocational high schools, preparing students to thrive in an increasingly digital and globalized workforce.

LITERATURE REVIEW

The integration of digital technology in English language teaching (ELT), often referred to as Technology-Enhanced Language Learning (TELL), has gained significant attention in recent years as a means to create more interactive, authentic, and personalized learning experiences. Shadiev et al. (2020) conducted a comprehensive review of 398 articles on technology-enhanced language learning and teaching, highlighting that digital tools significantly improve learner engagement, motivation, and language skills across various contexts. Similarly, Hasumi (2024) performed a bibliometric analysis of TELL in English language education, revealing a surge in publications focusing on emerging technologies such as artificial intelligence, virtual reality, and mobile applications that support multimodal language practice.

Recent studies emphasize the positive impact of specific digital tools on English proficiency. Bećirović (2021) found that technology-supported learning, combined with teacher guidance, enhances EFL students' performance, particularly in developing autonomy and 21st-century skills like collaboration and digital literacy. In vocational settings, Jiang (2024) demonstrated that technology-aided teaching modes positively affect critical thinking skills and English argumentative writing among students in higher vocational colleges. Furthermore, Pérez-Jorge et al. (2025) reviewed the application of virtual reality (VR), augmented reality (AR), and adaptive learning technologies in ESL education, concluding that these tools provide immersive experiences that improve vocabulary acquisition and speaking skills in secondary education contexts.

In the context of vocational education, digital transformation plays a crucial role in aligning language instruction with industry demands. Shi (2025) explored digital transformation in English language teaching within Chinese vocational education and reported that blended digital tools enhance instructional effectiveness, student motivation, and practical communication skills relevant to workplace scenarios. Gu (2024) investigated the use of digital human technology in vocational and technical colleges, showing improvements in interactive English teaching and learner engagement. Huang (2026) proposed a blended English teaching model under digital transformation for vocational colleges, integrating big data, AI, and 5G technologies, which resulted in better learning outcomes and personalized instruction.

Indonesian vocational high schools (SMK) have also begun adopting IT-based innovations, although research remains limited compared to general secondary education. Utami (2026) conducted a qualitative study on technology integration in English teaching at an Indonesian vocational school, revealing that tools such as YouTube, WhatsApp, and Canva are commonly used; however, their application often reinforces traditional norms rather than promoting Global Englishes or authentic communication. Setiawan (2021) examined virtual multimedia-based learning for language proficiency in Indonesian vocational high schools and found

notable improvements in student engagement and skill development. Additionally, Surahmat et al. (2026) systematically examined digital technology integration in ELT at vocational high schools, identifying both opportunities for skill enhancement and persistent challenges in infrastructure and teacher readiness.

Several studies highlight the benefits of gamification and learning management systems in Indonesian EFL contexts. Zuhriyah and Pratolo (2020) explored students' views on Quizizz as an assessment tool in EFL classes and reported increased motivation and immediate feedback that supports formative assessment. Sujannah et al. (2020) investigated blended learning using Google Classroom and found positive effects on writing ability across different autonomy levels among EFL students. Jamil et al. (2024) studied ICT professional development among experienced female EFL teachers in Indonesia, noting that proper training helps overcome internal and external barriers to technology integration.

Despite these benefits, significant challenges persist in integrating digital technology in Indonesian vocational schools. Rintaningrum (2023) identified multiple barriers, including insufficient time, limited access to resources, technical difficulties, and inadequate teacher digital competence. Limbong et al. (2024) revealed a gap between theoretical TPACK preparation of pre-service EFL teachers and actual classroom implementation due to poor infrastructure, slow internet, and lack of institutional support in Indonesian schools. Rahmawati (2025) further unpacked low digital competence among vocational educators, attributing it to external factors (limited internet, hardware, and training) and internal factors (beliefs and confidence levels, especially among senior teachers).

In Southeast Sulawesi and similar provincial areas, these challenges are often more pronounced due to regional disparities in infrastructure. While national policies such as Merdeka Belajar encourage digital innovation, localized studies at SMKN institutions remain scarce. Existing research tends to focus on urban or Java-based schools, leaving a gap in understanding implementation in technology-oriented classes like TKJ (Teknik Komputer dan Jaringan) in provincial vocational school, Kendari. The present study addresses this research gap by examining the integration of specific IT-based tools (Google Classroom, Canva for Education, Quizizz, and video-based materials) in English language teaching for 29 Grade XII TKJ students at one of Vocational School, Kendari, Southeast Sulawesi. By combining quantitative proficiency measures with qualitative insights into student motivation and challenges, this research contributes empirical evidence from an understudied vocational context in Eastern Indonesia. It builds upon global and national TELL literature while providing practical implications for teachers and policymakers aiming to enhance English instruction in vocational settings amid ongoing digital transformation.

METHOD

Design and Sample

This study employed a mixed-methods quasi-experimental design to examine the integration of digital technology in English language teaching. The quantitative component applied a one-group pretest-posttest design to measure students' English proficiency before and after the intervention, while the qualitative component explored students' perceptions, motivation, engagement, and challenges during the implementation of IT-based learning. A convergent parallel mixed-methods approach was used to enable triangulation of findings and provide a comprehensive understanding of both learning outcomes and contextual experiences (Creswell & Plano Clark, 2018). The quasi-experimental approach was selected due to the use of an intact class in a real school setting, where random assignment was not feasible. The study was conducted at a public Vocational High School in Kendari, Southeast Sulawesi, Indonesia, involving one intact class of Grade XII TKJ (Teknik Komputer dan Jaringan) consisting of 29 students, including 18 males and 11 females aged between 17 and 19 years. The participants were selected through purposive sampling, as they represented a technology-oriented vocational program where digital tools are closely aligned with both English learning and technical competencies. The students demonstrated varying levels of English proficiency and prior exposure to digital learning platforms, reflecting the characteristics of vocational learners in provincial areas of Indonesia.

Instruments and Procedures

Data were collected using multiple instruments to ensure validity and reliability. Quantitative data were obtained through an English proficiency test and a student motivation and engagement questionnaire. The English proficiency test consisted of a standardized pre-test and post-test adapted from Cambridge English and vocational English materials, covering listening, speaking, reading, and writing skills. The test included 50 items in various formats, such as multiple choice, matching, short answer, and essay, with a maximum score of 100. It was validated by two English lecturers and piloted on a similar group, resulting in a Cronbach's alpha of 0.87, indicating good reliability. The questionnaire was designed using a 5-point Likert scale and adapted from established instruments such as the Motivated Strategies for Learning Questionnaire (MSLQ). It comprised 25 items categorized into three dimensions: motivation, engagement, and perceived usefulness of digital tools, with a reliability coefficient of 0.89.

Qualitative data were collected through semi-structured interviews, classroom observations, and student reflection journals. Interviews were conducted with 10 selected students based on their post-test performance and with the English teacher to gain deeper insights into their experiences and challenges. Classroom observations were carried out as non-participant observations across 12 sessions using a structured checklist that focused on student interaction, use of digital tools, and classroom dynamics. In addition, students submitted weekly reflection journals

through Google Classroom to document their perceptions and learning experiences throughout the intervention.

The data collection procedure was conducted over one semester, approximately 16 weeks. In the first week, students completed the pre-test and initial questionnaire. The intervention was then implemented through the integration of digital tools into weekly English lessons, which were conducted for three sessions of 45 minutes each per week. The digital tools used included Google Classroom for managing learning materials and assignments, Canva for Education for creating visual and presentation content, Quizizz for formative assessments, and authentic video materials from platforms such as YouTube and TED-Ed to enhance listening and speaking skills. The instructional process followed the Merdeka Belajar curriculum, emphasizing communicative competence and integrating language skills through technology-based activities such as digital storytelling, online discussions, and collaborative projects. During the intervention, classroom observations and student reflection journals were collected continuously. At the end of the semester, the post-test and final questionnaire were administered, followed by semi-structured interviews. Quantitative data were collected in a controlled classroom setting, while qualitative data were gathered in a supportive environment to encourage open responses. The researcher also acted as the teacher and maintained reflexivity to minimize potential bias.

Data Analysis

Quantitative data were analyzed using both descriptive and inferential statistics. Descriptive statistics, including mean and standard deviation, were used to summarize students' performance on the pre-test and post-test. To determine whether there was a statistically significant difference between the two sets of scores, a paired-sample t-test was conducted using SPSS version 27. Questionnaire data were analyzed descriptively to identify trends in students' motivation, engagement, and perceptions, and further analyzed using the Wilcoxon signed-rank test where appropriate.

Qualitative data obtained from interviews, classroom observations, and student reflection journals were transcribed verbatim and analyzed using Braun and Clarke's (2006) six-phase thematic analysis. The analysis process involved familiarization with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report. ATLAS.ti software was used to support data organization and coding. The themes were identified inductively and then compared with quantitative findings to identify convergence or divergence. To enhance the trustworthiness of the data, member checking was conducted by sharing the findings with selected participants for validation.

RESULT AND DISCUSSION

The quantitative analysis of the English proficiency test revealed a substantial improvement in students' overall language skills after the one-semester intervention. The pre-test mean score was 62.34 (SD = 8.76), while the post-test mean score increased to 80.17 (SD = 7.45). A paired-sample t-test indicated that this difference was statistically significant ($t(28) = -9.87, p < 0.001$), with a large effect size (Cohen's $d = 2.12$). The greatest gains were observed in speaking and listening skills, which rose by an average of 22.8 points, followed by writing (18.5 points) and reading (15.2 points). Regarding student motivation and engagement, the Likert-scale questionnaire showed a notable positive shift. The pre-intervention mean score for motivation was 3.28 (SD = 0.81), increasing to 4.21 (SD = 0.67) post-intervention. Similarly, engagement scores rose from 3.15 to 4.35. Wilcoxon signed-rank tests confirmed significant improvements across all dimensions ($p < 0.01$), particularly in items related to perceived usefulness of digital tools and enjoyment of interactive activities.

Qualitative data from semi-structured interviews highlighted students' positive perceptions toward the use of digital platforms. Ten interviewed students consistently reported that Google Classroom facilitated easier access to materials and assignment submission, while Quizizz made assessment sessions more enjoyable and less stressful due to its gamified features. Several students mentioned that immediate feedback from Quizizz helped them identify weaknesses quickly and motivated them to improve. Classroom observation records over 12 sessions documented increased student participation. Before the intervention, active student talk time averaged only 28% of lesson duration. After implementation, this figure rose to 67%, with students frequently engaging in pair and group digital collaborative tasks using Canva for presentations and video-based discussions. Off-task behavior decreased significantly, especially during gamified activities.

Analysis of weekly reflection journals revealed recurring themes of enhanced learner autonomy and authentic language exposure. Many students noted that creating digital posters and short videos with Canva encouraged them to practice English in meaningful contexts relevant to their TKJ major, such as explaining network troubleshooting or software installation. This integration appeared to strengthen the connection between English and their vocational competencies. However, several challenges were also documented. Unstable internet connectivity disrupted synchronous activities on at least four occasions, forcing the teacher to switch to offline modes. Additionally, a small number of students (approximately 14%) reported initial difficulties in navigating certain tools due to limited prior digital literacy, although these issues diminished over time with guided practice.

Thematic analysis of teacher interviews corroborated student data, indicating that the combination of tools created a more dynamic classroom atmosphere. The teacher observed higher enthusiasm and willingness to communicate in English, particularly during video-based role-play activities that simulated workplace scenarios. Overall, the convergence of quantitative and qualitative findings demonstrated that the integration of selected IT-based innovations led to

measurable improvements in both English proficiency and affective factors, while also uncovering contextual barriers typical of vocational schools in provincial Indonesia.

The significant improvement in English proficiency scores aligns with previous studies on technology-enhanced language learning in vocational contexts. The 28.4% average increase observed in this study is consistent with findings from quasi-experimental research that reported notable gains in language skills when digital tools were systematically integrated. The larger gains in speaking and listening skills can be attributed to the authentic video materials and interactive Quizizz activities, which provided repeated exposure to real-life English usage.

The rise in motivation and engagement scores supports the notion that gamification and interactive digital platforms enhance student interest in EFL learning. Quizizz, in particular, appeared to reduce anxiety associated with traditional testing while fostering a competitive yet supportive learning environment. This result echoes earlier research indicating that immediate feedback and game elements increase intrinsic motivation among vocational students who often perceive English as less directly relevant to their technical majors.

Qualitative findings regarding learner autonomy and authentic exposure extend current understanding of technology integration in SMK settings. By using Canva for Education to create vocationally relevant materials, students were able to bridge English language practice with their TKJ competencies, making learning more meaningful. This synergistic effect between language and technical skills represents an important contribution to the limited literature on technology-enhanced ELT in technology-oriented vocational classes. The observed increase in student participation during classroom observations confirms that digital tools can shift classroom dynamics from teacher-centered to more student-centered approaches. The use of Google Classroom for collaborative tasks encouraged peer interaction and collective problem-solving, which is particularly valuable in vocational education where teamwork is a key workplace skill.

Nevertheless, the challenges related to internet connectivity and initial digital literacy gaps highlight persistent infrastructural and human resource barriers in provincial vocational schools. These findings are consistent with national studies that identify external factors such as limited bandwidth and unequal access as major obstacles to effective technology integration in Indonesian education, especially outside major urban centers. The gradual reduction in navigation difficulties over the semester suggests that sustained teacher guidance and scaffolding play a crucial role in successful implementation. This implies that professional development programs for vocational English teachers should emphasize not only tool mastery but also pedagogical strategies for supporting students with varying digital backgrounds.

From a broader perspective, the positive outcomes of this study in a class of only 29 students indicate that even modest-scale integration of accessible and low-cost digital tools can yield meaningful results. This is encouraging for similar SMKN institutions with constrained resources, as the tools used (Google Classroom, Canva, and Quizizz) are largely free or educationally subsidized. While the integration of IT-based innovations demonstrated clear benefits for English language teaching in this vocational context, sustainable success requires addressing infrastructural limitations and providing ongoing teacher support. Future interventions should explore hybrid models that combine online and offline activities to maximize effectiveness in regions with unreliable connectivity.

CONCLUSION

This study has successfully demonstrated the positive impact of integrating digital technology in English language teaching at Vocational School, Kendari, Southeast Sulawesi. Through the systematic implementation of Google Classroom, Canva for Education, Quizizz, and authentic video-based materials over one semester, the 29 Grade XII TKJ students showed statistically significant improvements in English proficiency, with an average increase of 28.4% in post-test scores. Speaking and listening skills experienced the most substantial gains, followed by writing and reading. Moreover, student motivation and engagement rose markedly, as evidenced by higher Likert-scale scores and qualitative reports of increased participation, learner autonomy, and authentic language practice. These findings confirm that accessible IT-based innovations can effectively enhance both linguistic competence and affective factors in vocational EFL classrooms, particularly when tools are aligned with students' technical background in TKJ.

Despite the encouraging results, the study also revealed contextual challenges typical of provincial vocational schools in Indonesia, such as unstable internet connectivity and initial gaps in students' digital literacy. These obstacles occasionally disrupted synchronous activities and required additional scaffolding from the teacher. Nevertheless, most difficulties diminished over time with consistent guidance and the adoption of hybrid approaches. The convergence of quantitative gains and qualitative insights underscores that successful technology integration depends not only on the selection of appropriate tools but also on contextual adaptation and ongoing teacher support in resource-limited settings.

The strategic integration of digital technology holds strong potential to improve English language education quality in Indonesian vocational high schools. This research contributes empirical evidence from an understudied regional vocational context and offers practical implications for teachers, administrators, and policymakers aiming to prepare students for the digital workforce. Future efforts should focus on infrastructure enhancement, teacher professional development, and hybrid models that combine online and offline activities. By addressing existing barriers while building upon the demonstrated benefits, vocational institutions can

foster more engaging, relevant, and effective English language learning experiences that better equip graduates for global opportunities.

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