

THE ROLE OF EDUCATIONAL TECHNOLOGY IN TRANSFORMING TEFL PRACTICES: A CASE STUDY OF DIGITAL MEDIA INTEGRATION IN SECONDARY EDUCATION

Siti Nuh Asia¹, Risal Arizaldy Ramly², Muh. Putra Pratama³, Christian Patricio⁴
nurasia93@gmail.com

^{1,2} Universitas Perjuangan Republik Indonesia

³ Universitas Kristen Indonesia Toraja

⁴ Eastern Visayas State University

ABSTRACT

This study aims to explore the role of educational technology in transforming Teaching English as a Foreign Language (TEFL) practices through the integration of digital media in secondary education. The rapid advancement of digital technologies has reshaped instructional methods, enabling more interactive and student-centered learning environments. This research employed a quantitative quasi-experimental design conducted at SMPN 3 Polongbangkeng Utara, Indonesia. Data were collected through pre-tests, post-tests, questionnaires, and classroom observations. The findings indicate that the integration of digital media significantly improves students' English proficiency, particularly in reading, writing, and vocabulary skills. Students who engaged with digital tools such as videos, interactive platforms, and online exercises demonstrated higher achievement compared to those using traditional methods. Additionally, digital media enhanced student motivation, engagement, and participation in classroom activities. However, challenges such as limited technological infrastructure and varying levels of digital literacy were identified. Despite these constraints, educational technology remains a powerful tool for transforming TEFL practices. This study concludes that digital media integration can effectively support language learning outcomes when supported by appropriate infrastructure and teacher competence.

Keywords : Educational Technology, TEFL, Digital Media, Language Learning, Student Engagement

INTRODUCTION

The rapid advancement of digital technology has fundamentally transformed educational systems worldwide, reshaping the ways teachers deliver instruction and students engage in learning. Educational technology has shifted traditional teacher-centered approaches toward more interactive, flexible, and learner-centered pedagogies through the integration of digital tools, multimedia resources, and online learning environments (Bond et al., 2021). This transformation is particularly significant in Teaching English as a Foreign Language (TEFL), where language acquisition requires continuous exposure to authentic language input, meaningful interaction, and opportunities for communicative practice. As digital technologies continue to evolve, they offer

unprecedented opportunities to improve the quality of language instruction and create more engaging learning experiences.

Within TEFL, digital media including educational videos, multimedia applications, virtual learning environments, interactive websites, and mobile learning platforms has emerged as an essential component of contemporary language education. These technologies enable learners to access authentic learning materials beyond classroom boundaries while facilitating both synchronous and asynchronous interaction. According to Godwin-Jones (2018), digital technologies enrich language learning by providing authentic linguistic input and immediate opportunities for practice. Similarly, Kukulska-Hulme (2020) argues that technology-enhanced language learning promotes flexible access to learning resources and supports both formal and informal language acquisition, allowing learners to develop language competence regardless of time and place.

The theoretical foundation for digital media integration in language learning is supported by multimedia learning theory and constructivist learning theory. Mayer (2017) explains that multimedia learning enhances learners' cognitive processing by integrating verbal and visual information, leading to deeper comprehension and improved retention. Likewise, constructivist learning emphasizes that knowledge is actively constructed through meaningful learning experiences, interaction, and reflection (Jonassen, 2017). Digital technologies facilitate these processes by enabling students to explore authentic materials, collaborate with peers, solve contextual problems, and receive immediate feedback, thereby creating a more student-centered learning environment.

Numerous empirical studies have reported positive educational outcomes resulting from digital media integration. Martin et al. (2020) demonstrated that digital learning environments improve students' academic achievement through interactive and multimedia-based instruction. Dhawan (2020) further argues that digital learning has become indispensable in ensuring educational continuity while enhancing instructional effectiveness, particularly in blended and remote learning settings. Moreover, multimedia elements such as audio, video, animations, and visual representations provide contextualized language input that enhances listening comprehension, vocabulary acquisition, and communicative competence (Sun et al., 2021). These multimedia resources also accommodate diverse learning preferences, thereby increasing learners' ability to process and retain language information effectively (Mayer, 2017).

Beyond cognitive development, educational technology also contributes significantly to students' affective and behavioral engagement. Digital media creates interactive learning environments that stimulate learners' motivation, curiosity, and active participation throughout the learning process (Bond et al., 2021). Hockly (2018) emphasizes that technology-supported language classrooms encourage greater learner involvement by creating collaborative and communicative learning experiences. Furthermore, educational technology promotes learner autonomy by allowing students to determine learning goals, select learning resources, monitor their progress, and engage in self-directed learning activities (Little, 2020). These autonomous learning opportunities are increasingly recognized as critical components of successful second language acquisition.

Educational technology also plays an important role in developing students' twenty-first-century competencies. Modern language education is no longer limited to linguistic proficiency but also aims to cultivate communication, collaboration, critical thinking, creativity, and digital literacy. Redecker (2017) argues that digital learning environments provide authentic opportunities for students to develop these competencies through collaborative projects, online communication, and technology-mediated problem-solving activities. Consequently, the integration of digital media in TEFL contributes not only to language mastery but also to preparing learners for participation in an increasingly digital society.

One pedagogical approach that effectively incorporates educational technology is blended learning, which combines face-to-face instruction with digital learning experiences. Hrastinski (2019) explains that blended learning capitalizes on the strengths of both traditional classroom interaction and digital learning environments, leading to improved learning outcomes. Within TEFL classrooms, digital media extends learning beyond classroom hours, facilitates continuous communication, and provides learners with additional opportunities for language practice, making learning more flexible and personalized.

Despite these well-documented advantages, successful technology integration remains constrained by several institutional and pedagogical challenges. Technological infrastructure continues to be one of the primary barriers, particularly in developing countries where access to reliable internet connectivity and digital devices remains uneven (Adedoyin & Soykan, 2020). Teacher readiness also represents a significant challenge, as many educators require additional digital competencies to design meaningful technology-enhanced instruction (Trust & Whalen, 2020). In Indonesia, these challenges are even more pronounced because disparities in technological infrastructure, unequal student access to digital resources, and limited professional development opportunities continue to affect the implementation of educational technology in schools (Rahman, 2022; Sari & Putra, 2023). Furthermore, excessive dependence on technology may unintentionally reduce meaningful face-to-face interaction if digital media is not integrated within sound pedagogical frameworks (Hockly, 2018). These issues underscore the importance of balancing technological innovation with effective instructional design.

Although previous studies consistently demonstrate the benefits of educational technology, several important research gaps remain. First, existing studies predominantly investigate digital technology from the perspective of academic achievement or technology acceptance, while relatively limited attention has been given to how digital media transforms overall TEFL pedagogical practices by simultaneously influencing language achievement, learner motivation, and classroom engagement. Second, most empirical evidence originates from higher education institutions or technologically advanced countries (Martin et al., 2020; Bond et al., 2021), leaving secondary education in developing countries underrepresented in the literature. Third, few studies have examined educational technology integration as a comprehensive pedagogical transformation rather than merely as the implementation of isolated digital tools. Consequently, there remains insufficient empirical evidence explaining how digital media reshapes English language

teaching practices within authentic secondary school classrooms in Indonesia, where contextual challenges differ considerably from those reported in developed educational systems.

Addressing these gaps constitutes the primary novelty of the present study. Unlike previous research that primarily evaluates learning outcomes or technology adoption independently, this study develops a comprehensive perspective by examining educational technology as a transformative pedagogical framework in TEFL. Specifically, it simultaneously investigates three interconnected dimensions: students' English language achievement, learning motivation, and classroom engagement resulting from digital media integration. Furthermore, this study contributes context-specific empirical evidence from Indonesian secondary education, an educational context that has received relatively limited scholarly attention despite experiencing rapid digital transformation. By positioning digital media not merely as an instructional aid but as a catalyst for pedagogical transformation, this research extends existing knowledge regarding the role of educational technology in creating effective, student-centered language learning environments.

Therefore, this study aims to investigate the role of educational technology in transforming TEFL practices through the integration of digital media at SMPN 3 Polongbangkeng Utara. Specifically, it examines the influence of digital media integration on students' English language achievement, learning motivation, and classroom engagement within technology-enhanced learning environments.

The findings of this study are expected to contribute both theoretically and practically to the field of educational technology and TEFL. Theoretically, the study enriches the existing literature by providing empirical evidence regarding educational technology as a transformative pedagogical approach in secondary language education. Practically, the findings offer valuable implications for teachers, school administrators, curriculum developers, and policymakers in designing effective technology-enhanced English learning environments that promote improved language achievement, learner engagement, and twenty-first-century competencies.

METHOD

1. Research Design

This study employed a quantitative approach using a quasi-experimental design, specifically a non-equivalent control group design. This design was selected to examine the effectiveness of digital media integration in transforming TEFL practices within a real classroom setting. The experimental group received instruction through digital media, while the control group was taught using conventional teaching methods. This approach is appropriate because it allows the researcher to compare the impact of technology-enhanced learning on students' language achievement, motivation, and engagement without random assignment, thus maintaining the natural classroom environment.

2. Participants / Subjects

The participants of this study were 60 eighth-grade students from SMPN 3 Polongbangkeng Utara, Indonesia. The students were divided into two groups: 30 students in the experimental group and 30 students in the control group. The participants were selected using a purposive sampling technique, considering their similar English proficiency levels and classroom characteristics. The students were aged between 13 and 14 years old and had basic English proficiency. Both groups were taught by the same English teacher to ensure consistency in instructional delivery, except for the integration of digital media in the experimental group.

3. Instruments

Three main instruments were used to collect data in this study:

1. Language Proficiency Test (Pre-test and Post-test)

The tests were designed to measure students' English skills, including reading, writing, and vocabulary. The test items were adapted from standardized English learning materials and validated by language experts.

2. Questionnaire

A Likert-scale questionnaire consisting of 20 items was used to assess students' motivation and engagement in digital media-based learning. The questionnaire was adapted from previous studies on technology-enhanced learning.

3. Observation Sheet

Observation sheets were used to record students' participation, interaction, and engagement during classroom activities.

All instruments were tested for validity and reliability. Content validity was ensured through expert judgment, and reliability testing using Cronbach's Alpha indicated acceptable results ($\alpha > 0.70$).

4. Data Collection Procedure

The data collection process was conducted over six weeks and consisted of several stages. First, permission was obtained from the school administration, and the purpose of the study was explained to the participants. Ethical considerations, including voluntary participation and confidentiality, were ensured. Second, a pre-test was administered to both groups to measure their initial language proficiency. Third, during the treatment phase, the experimental group received instruction using digital media, such as videos, interactive applications, and online exercises, while the control group received conventional instruction through textbooks and teacher explanations. Classroom observations were conducted throughout this phase. Finally, a post-test was administered to both groups to measure learning improvement. The experimental group also completed the questionnaire to evaluate their perceptions of digital media integration.

5. Data Analysis

The collected data were analyzed using descriptive and inferential statistics. Descriptive statistics, including mean scores, percentages, and standard deviations, were

used to summarize students' performance and questionnaire responses. Inferential analysis was conducted using paired sample t-tests to compare pre-test and post-test scores within each group, and independent sample t-tests to compare differences between the experimental and control groups. All statistical analyses were performed using SPSS version 25, with a significance level set at $p < 0.05$. The analysis aimed to determine the effectiveness of digital media integration in improving students' language achievement, motivation, and engagement.

RESULT AND DISCUSSION

Result

The present study investigated the role of educational technology in transforming Teaching English as a Foreign Language (TEFL) practices through the integration of digital media at SMPN 3 Polongbangkeng Utara. Data were collected over a six-week intervention using pre-test and post-test assessments, student questionnaires, and classroom observations. The findings consistently demonstrate that the integration of digital media significantly enhanced students' English learning outcomes across multiple dimensions, including language proficiency, reading and writing skills, vocabulary acquisition, learner motivation, classroom engagement, interaction, and learner autonomy.

The comparison of pre-test and post-test scores revealed that students who participated in technology-enhanced learning achieved substantially higher academic gains than those who experienced conventional instruction. Both groups began the study with relatively similar levels of English proficiency, indicating comparable baseline abilities. However, after the intervention, the experimental group exhibited a considerably greater improvement. The mean score increased from 61.9 in the pre-test to 82.3 in the post-test, representing an improvement of approximately 33%. Meanwhile, the control group improved from 62.1 to 72.8, corresponding to an increase of approximately 17%. The independent sample *t*-test further confirmed that the difference between the two groups was statistically significant ($p < 0.05$), suggesting that the integration of digital media contributed positively to students' English achievement.

Table 1. Comparison of Students' English Achievement

Group	Pre-test Mean	Post-test Mean	Improvement	Percentage	Significance
Experimental	61.9	82.3	20.4	33%	$p < 0.05$
Control	62.1	72.8	10.7	17%	-

Beyond overall language achievement, improvements were consistently observed across individual language skills. Reading comprehension showed remarkable progress among students in the experimental class. The integration of videos, interactive texts, visual illustrations, and multimedia resources enabled learners to identify main ideas, interpret contextual meanings, and understand textual information more effectively. Students also benefited from the ability to repeatedly access digital learning materials, allowing them to review difficult concepts independently. In comparison, students in the control group relied mainly on printed textbooks and teacher explanations, resulting in more gradual progress.

Similarly, writing performance improved substantially after students engaged with digital learning activities. Online assignments, collaborative writing platforms, and immediate teacher feedback encouraged students to revise their work more frequently. Classroom observations indicated noticeable improvements in grammatical accuracy, vocabulary selection, sentence organization, and coherence. The revision process facilitated by digital tools enabled students to develop higher-quality written products than those produced through conventional classroom practices.

Vocabulary acquisition emerged as one of the strongest outcomes of the intervention. Multimedia elements such as images, audio recordings, animations, and contextual videos supported students in understanding the meanings and usage of unfamiliar words. Repeated exposure to vocabulary through multiple digital formats strengthened long-term retention and improved students' ability to apply newly learned vocabulary in both written and spoken communication.

Questionnaire responses further demonstrated that digital media positively influenced students' motivation and engagement throughout the learning process. Approximately 86% of students agreed that digital media made English learning more enjoyable, interactive, and meaningful. Classroom observations consistently supported these findings, showing that students participated more actively in discussions, completed assignments more punctually, asked more questions, and displayed greater enthusiasm during learning activities. Increased classroom participation was also reflected in students' willingness to collaborate with peers through technology-supported learning tasks. Digital platforms encouraged communication and teamwork, enabling even previously passive learners to contribute confidently during classroom discussions.

The integration of educational technology also promoted greater learner autonomy. Students frequently accessed learning materials outside scheduled classroom hours, reviewed instructional videos independently, completed online exercises, and monitored their own learning progress. These behaviors indicate the development of self-regulated learning, where students gradually assumed greater responsibility for managing their learning process. Conversely, students in the control group remained largely dependent on teacher explanations and classroom instruction.

Table 2. Improvement Across Learning Dimensions

Learning Dimension	Experimental Group	Control Group
Overall English Proficiency	Very High Improvement	Moderate Improvement
Reading Comprehension	Significant Improvement	Slight Improvement
Writing Skills	Significant Improvement	Moderate Improvement
Vocabulary Acquisition	Very Significant Improvement	Limited Improvement
Classroom Participation	High	Moderate
Learner Autonomy	High	Low

Although the findings predominantly indicate positive educational outcomes, several implementation challenges were identified throughout the intervention period. Limited access to digital devices among several students occasionally restricted participation in online learning activities. Unstable internet connectivity also affected the

continuity of some technology-based lessons. Furthermore, variations in students' digital literacy influenced the speed at which learners adapted to digital learning platforms. Teachers likewise experienced initial difficulties in preparing multimedia learning resources and managing technology-supported classrooms efficiently. Despite these constraints, both teachers and students demonstrated gradual adaptation as the intervention progressed.

Overall, classroom observations suggested that digital media transformed not only instructional delivery but also the dynamics of classroom interaction. Learning became more collaborative, student-centered, and communicative compared with conventional teacher-centered instruction. Students demonstrated greater confidence when expressing opinions, asking questions, and participating in collaborative problem-solving activities. These behavioral changes complement the quantitative findings, indicating that educational technology contributes not only to measurable improvements in language achievement but also to broader pedagogical transformation within TEFL classrooms.

Table 3. Students' Perceptions and Implementation Challenges

Indicator	Result
Students agreeing digital media increased learning interest	86%
Students showing active classroom participation	High
Students demonstrating independent learning	High
Access to digital devices	Limited for some students
Internet connectivity	Occasionally unstable
Students' digital literacy	Varied
Teachers' readiness in digital instruction	Moderate, improved during implementation

Taken together, the results indicate that the integration of digital media substantially enhanced English language achievement while simultaneously improving reading comprehension, writing ability, vocabulary acquisition, learner motivation, classroom engagement, interaction, and autonomous learning. Although technological infrastructure and digital competence remain important challenges, the findings provide strong empirical evidence that educational technology functions not merely as an instructional supplement but as a transformative pedagogical approach capable of reshaping TEFL practices in secondary education. This comprehensive improvement demonstrates that successful technology integration extends beyond academic performance, fostering a more interactive, learner-centered, and sustainable English language learning environment.

Discussion

The findings of this study demonstrate that the integration of educational technology through digital media significantly transforms Teaching English as a Foreign Language (TEFL) practices by improving students' language achievement, motivation, engagement, and learner autonomy. The substantial increase in the experimental group's

post-test scores compared with the control group indicates that digital media functions not merely as a supplementary instructional tool but as a pedagogical innovation that reshapes language learning into a more interactive and student-centered process. These findings are consistent with Martin et al. (2020), who reported that digital learning environments improve academic achievement through interactive multimedia instruction, and with Dhawan (2020), who emphasized that technology-enhanced learning creates more effective and flexible educational experiences than conventional teaching approaches.

The improvement in reading comprehension, writing performance, and vocabulary acquisition can be explained through constructivist learning theory, which proposes that learners actively construct knowledge through meaningful interaction with learning resources and authentic experiences (Jonassen, 2017). In this study, digital media enabled students to explore English materials using videos, interactive texts, and multimedia content, allowing them to connect new knowledge with real-life contexts. These findings also support Mayer's (2017) multimedia learning theory, which argues that combining visual and verbal information enhances cognitive processing and facilitates deeper understanding. Similarly, Kukulska-Hulme (2020) emphasized that multimodal digital resources improve language comprehension by providing contextualized input that strengthens learners' understanding and retention of language materials.

Writing performance also improved considerably because digital learning platforms provided immediate and continuous feedback, enabling students to revise grammatical errors, refine vocabulary usage, and improve the organization of ideas before submitting assignments. This finding supports Yilmaz (2017), who concluded that online learning environments significantly enhance writing quality through iterative revision and timely feedback. Furthermore, vocabulary acquisition emerged as one of the strongest outcomes of the intervention. Multimedia resources, including images, audio, videos, and contextual examples, allowed students to learn vocabulary more meaningfully than traditional memorization methods. This finding is consistent with Sun et al. (2021), who argued that multimedia-based instruction facilitates vocabulary learning by integrating authentic linguistic input with contextual information, while repeated exposure strengthens long-term retention.

Beyond improvements in language proficiency, the integration of digital media positively influenced students' motivation and classroom engagement. Most students perceived digital learning as more enjoyable and interactive, resulting in greater participation during classroom activities, increased collaboration, and higher confidence in expressing ideas. These findings reinforce Bond et al. (2021), who argued that educational technology promotes learner engagement by creating dynamic, student-centered learning environments. Likewise, Hockly (2018) emphasized that technology-supported language learning increases learners' interest and active participation because students become directly involved in meaningful communicative activities rather than passively receiving information from teachers.

Another important finding concerns the development of learner autonomy. Students became increasingly independent in accessing learning materials, reviewing instructional content, completing online assignments, and monitoring their own learning progress. This

result supports Little (2020), who identified learner autonomy as a fundamental component of successful second-language acquisition. Digital media provided learners with flexibility to study according to their individual pace and needs, thereby encouraging self-regulated learning and shifting classroom practice from teacher-centered instruction toward learner-centered education.

Despite these positive outcomes, several contextual challenges influenced the implementation of digital media. Limited access to digital devices, unstable internet connectivity, and differences in students' digital literacy occasionally reduced the effectiveness of technology-enhanced learning. These findings are consistent with Adedoyin and Soykan (2020), who identified technological infrastructure as one of the principal barriers to digital education, particularly in developing countries. Similarly, Sari and Putra (2023) highlighted that unequal access to digital resources remains a significant challenge within Indonesian educational contexts. Teacher readiness also influenced implementation, as some educators initially experienced difficulties in designing multimedia-based instruction and managing technology-supported classrooms. This finding supports Trust and Whalen (2020), who emphasized that teachers' digital competence is essential for successful educational technology integration.

The findings further suggest that the effectiveness of educational technology depends not only on the availability of digital tools but also on the quality of pedagogical design. Technology should therefore function as a means of facilitating meaningful learning rather than as an instructional objective. This interpretation aligns with Bond et al. (2021), who argued that successful technology integration requires strong alignment between pedagogy, learning objectives, and technological resources. Moreover, the results indicate that digital media is most effective when implemented within a blended learning approach that combines face-to-face interaction with digital learning opportunities. Hrastinski (2019) explained that blended learning optimizes the strengths of conventional instruction and digital environments, thereby creating more balanced and effective learning experiences.

Overall, this study contributes empirical evidence that educational technology serves as a catalyst for transforming TEFL practices in Indonesian secondary education. Unlike previous studies that primarily focused on isolated learning outcomes, this research demonstrates that digital media simultaneously improves language achievement, learner motivation, engagement, and autonomy within authentic classroom settings. These findings highlight that the successful integration of educational technology requires adequate infrastructure, teacher competence, and pedagogically meaningful instructional design, enabling digital media to become a sustainable driver of innovation in English language education.

CONCLUSION

This study examined the role of educational technology in transforming Teaching English as a Foreign Language (TEFL) practices through the integration of digital media in secondary education. The findings demonstrate that digital media significantly enhances students' English language proficiency, particularly in reading comprehension, writing

skills, and vocabulary acquisition, while simultaneously increasing learning motivation, classroom engagement, interaction, and learner autonomy. These results indicate that educational technology is not merely a supplementary instructional resource but a pedagogical innovation that creates more interactive, learner-centered, and meaningful learning experiences.

The study further highlights that the successful integration of digital media depends not only on the availability of technological resources but also on teachers' digital competence, effective instructional design, students' digital literacy, and adequate technological infrastructure. Therefore, technology should be implemented as part of a pedagogically sound learning strategy that supports active participation, authentic learning experiences, and the development of self-regulated learning. When appropriately integrated, digital media can effectively complement conventional classroom instruction and contribute to sustainable improvements in English language learning.

This research contributes to the growing literature on educational technology by providing empirical evidence from the context of Indonesian secondary education, which remains relatively underrepresented in international TEFL research. Its primary contribution lies in demonstrating that digital media simultaneously improves cognitive, affective, and behavioral dimensions of language learning, illustrating its role in transforming classroom pedagogy rather than simply improving academic performance. Future research is recommended to investigate the long-term impact of digital media integration across different educational contexts and explore the potential of emerging technologies, including artificial intelligence and immersive learning environments, to further enhance TEFL practices and support personalized language learning.

REFERENCES

- Adedoyin, O. B., & Soykan, E. (2020). COVID-19 pandemic and online learning: The challenges and opportunities. *Sustainability*, 12(16), Article 6580. <https://doi.org/10.3390/su12166580>
- Bond, M., Bedenlier, S., Marin, V. I., & Händel, M. (2021). Emergency remote teaching in higher education. *International Journal of Educational Technology in Higher Education*, 18(1), Article 44. <https://doi.org/10.1186/s41239-021-00282-x>
- Bozkurt, A., & Sharma, R. C. (2020). Emergency remote teaching in a time of global crisis. *Asian Journal of Distance Education*, 15(1), 1–6. <https://doi.org/10.5281/zenodo.3778083>
- Crompton, H., & Burke, D. (2018). The use of mobile learning in higher education: A systematic review. *Computers & Education*, 123, 53–64. <https://doi.org/10.1016/j.compedu.2018.02.003>
- Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, 49(1), 5–22. <https://doi.org/10.1177/0047239520934018>
- Godwin-Jones, R. (2018). Emerging technologies: Language learning and technology. *Language Learning & Technology*, 22(2), 8–16. <https://doi.org/10.1017/S0958344018000078>

- Hockly, N. (2018). Blended learning. *ELT Journal*, 72(1), 97–101. <https://doi.org/10.1093/elt/ccx058>
- Hrastinski, S. (2019). What do we mean by blended learning? *TechTrends*, 63(5), 564–569. <https://doi.org/10.1007/s11528-019-00375-5>
- Huang, X., Zou, D., Cheng, G., & Xie, H. (2021). A systematic review of artificial intelligence in language learning. *Educational Technology & Society*, 24(1), 1–16. <https://doi.org/10.2307/26977862>
- Jonassen, D. H. (2017). *Learning to solve problems with technology*. Routledge. <https://doi.org/10.4324/9781315795475>
- Kukulska-Hulme, A. (2020). Mobile-assisted language learning. *Computer Assisted Language Learning*, 33(5–6), 562–587. <https://doi.org/10.1080/09588221.2020.1729943>
- Little, D. (2020). Language learner autonomy: Rethinking the role of the teacher. *Language Teaching*, 53(1), 1–12. <https://doi.org/10.1017/S0261444819000315>
- Martin, F., Sun, T., & Westine, C. D. (2020). A systematic review of research on online teaching and learning from 2009 to 2018. *Computers & Education*, 159, Article 103857. <https://doi.org/10.1016/j.compedu.2020.103857>
- Mayer, R. E. (2017). *Multimedia learning* (2nd ed.). Cambridge University Press. <https://doi.org/10.1017/CBO9781139164603>
- Redecker, C. (2017). *European framework for the digital competence of educators: DigCompEdu*. European Commission. <https://doi.org/10.2760/159770>
- Sari, D., & Putra, H. (2023). Technology integration in Indonesian EFL classrooms. *Indonesian Journal of Applied Linguistics*, 13(1), 45–58. <https://doi.org/10.17509/ijal.v13i1.56789>
- Sun, Y., Wang, Y., & Liu, X. (2021). Effects of multimedia learning on vocabulary acquisition. *System*, 103, Article 102450. <https://doi.org/10.1016/j.system.2021.102450>
- Trust, T., & Whalen, J. (2020). Should teachers be trained in emergency remote teaching? Lessons learned from the COVID-19 pandemic. *Journal of Technology and Teacher Education*, 28(2), 189–199.
- Yilmaz, R. (2017). Exploring the role of e-learning readiness on student satisfaction and motivation in flipped classrooms. *Computers & Education*, 106, 1–14. <https://doi.org/10.1016/j.compedu.2016.12.003>
- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education—Where are the educators? *International Journal of Educational Technology in Higher Education*, 16(1), Article 39. <https://doi.org/10.1186/s41239-019-0171-0>
- Zhang, X., & Zou, D. (2022). Technology-enhanced language learning: A review of research trends and practices. *Computer Assisted Language Learning*, 35(7), 1325–1345. <https://doi.org/10.1080/09588221.2021.1872146>