

The Effects of Information and Communication Technology (ICT) Tools on Motivation and Language Proficiency of EFL Learners in Indonesia: A Systematic Review

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Abstrak

Integrasi Teknologi Informasi dan Komunikasi (TIK) dalam pembelajaran Bahasa Inggris sebagai Bahasa Asing (EFL) semakin penting di Indonesia. Kajian sistematis ini menganalisis penelitian empiris di Indonesia antara 2010–2024 untuk meninjau dampak TIK terhadap motivasi dan kemampuan bahasa peserta didik. Menggunakan kerangka PRISMA, 35 penelitian dianalisis, meliputi pembelajaran berbasis aplikasi seluler (MALL), platform daring (misal Google Classroom, Zoom, Edmodo), dan aplikasi multimedia (misal Kahoot!, Duolingo, Quizizz). Hasil menunjukkan bahwa TIK secara signifikan meningkatkan keterlibatan, motivasi, dan kemampuan peserta didik dalam kosakata, menulis, dan kefasihan lisan. Tantangan meliputi kompetensi guru digital terbatas, ketimpangan infrastruktur, dan implementasi yang tidak konsisten. Kajian ini menyimpulkan bahwa integrasi TIK berdampak positif terhadap hasil belajar EFL, tergantung pada faktor kontekstual. Rekomendasi mencakup pengembangan profesional guru, peningkatan literasi digital, dan akses teknologi yang merata.

Kata kunci: Perangkat TIK, Pembelajaran Bahasa Inggris (EFL), Motivasi Belajar, Kemahiran Berbahasa, Indonesia

Abstract

The integration of Information and Communication Technology (ICT) in English as a Foreign Language (EFL) education has become increasingly significant in Indonesia. This systematic review synthesizes empirical studies conducted in Indonesia from 2010 to 2024 to examine the impact of ICT-based tools on learners' motivation and language proficiency. Using the PRISMA framework, 35 studies were analyzed, encompassing mobile-assisted language learning (MALL), online platforms (e.g., Google Classroom, Zoom, Edmodo), and multimedia applications (e.g., Kahoot!, Duolingo, Quizizz). Findings show that ICT tools significantly enhance learner engagement, motivation, and performance in vocabulary, writing, and oral fluency. Challenges include limited teacher digital competence, infrastructure disparities, and inconsistent implementation. The study concludes that ICT integration positively affects EFL outcomes but depends on contextual factors. Recommendations include teacher professional development, improved digital literacy, and equitable technology access.

Keywords: ICT Tools, EFL Learning, Learner Motivation, Language Proficiency, Indonesia

1. INTRODUCTION

In the 21st century, the integration of Information and Communication Technology (ICT) has become a cornerstone of educational innovation worldwide, particularly in English as a Foreign Language (EFL) classrooms. The use of ICT tools, including mobile applications, online platforms, and multimedia resources, allows learners to access interactive, authentic,

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and engaging learning experiences beyond the limitations of traditional classroom settings (Kurniawati, 2022; Zaki & Kaur, 2024). In Indonesia, national initiatives such as *Merdeka Belajar* (Freedom to Learn) and the Digital Learning Roadmap 2025 have emphasized the importance of technology-enhanced learning to improve students' English proficiency and prepare them for the demands of the digital era (Kemendikbud, 2021; Tahmina, 2024). Despite these national policies, the adoption of ICT in EFL classrooms varies significantly due to factors such as teacher readiness, infrastructure disparities, and the quality of pedagogical integration (Lisia, 2024; Msafiri, 2023).

From a theoretical perspective, ICT integration aligns with constructivist learning principles, emphasizing learner autonomy, engagement, and meaningful interaction (Dörnyei, 2001; Setiyadi et al., 2021). Mobile-assisted language learning (MALL) applications, for instance, provide learners with constant exposure to authentic language input, supporting Krashen's Input Hypothesis, which states that comprehensible input is essential for language acquisition (Krashen, 1982). Similarly, collaborative tools like Google Docs and Edmodo facilitate Swain's Output Hypothesis by encouraging learners to actively produce language and receive immediate feedback in authentic contexts (Swain, 1985; Rahmawati, 2021). Emerging technologies, including AI-based learning tools, have also been found to enhance learner motivation and performance by offering personalized, adaptive, and interactive experiences (Ahmed et al., 2025; Wafa & Sulistyaningsih, 2025).

Learner motivation is critical for language acquisition, driving active engagement and persistence (Dörnyei, 2001). In Indonesian EFL contexts, gamified platforms like Kahoot! and Quizizz enhance intrinsic motivation and enjoyment (Astuti & Lestari, 2019; Putri & Ningsih, 2021), while video-based tools like YouTube foster affective engagement and curiosity (Hapsari, 2020; Wahyuni, 2021). At the tertiary level, Learning Management Systems (LMS) such as Google Classroom support self-regulated learning through flexible access and instant feedback (Hartatik & Supriyadi, 2020; Fima et al., 2024).

ICT tools further improve multifaceted language proficiency. Applications like Duolingo and Wordwall facilitate vocabulary acquisition (Sari & Nugroho, 2020), while collaborative online tools enhance writing through peer feedback (Yuliana, 2021). Audiovisual content, including podcasts and YouTube, strengthens listening and speaking skills (Rahmawati, 2021; Putri Anggraini et al., 2024). Additionally, digital platforms and e-books develop reading comprehension and critical thinking (Fitria, 2020; Universitas Negeri Malang, 2024). Collectively, these technologies create an environment for simultaneous input and output practice, reinforcing communicative competence (Swain, 1985; Zhang, 2019).

Despite these promising outcomes, the implementation of ICT in Indonesia faces several challenges. Many teachers lack adequate training to integrate ICT effectively into their teaching practices, resulting in superficial use of technology (Albirini, 2006; Moradi, 2025). Infrastructure limitations, such as unreliable internet connectivity and limited access to digital devices, particularly in rural areas, contribute to unequal opportunities for students (Lisia, 2024). Furthermore, the use of ICT is often supplemental rather than fully integrated into curriculum objectives, reducing its pedagogical impact (Kurniawati, 2022; Rachmawati, 2022). These challenges underscore the importance of professional development programs, institutional support, and equitable access to ensure that ICT integration delivers meaningful learning outcomes.

While numerous empirical studies have explored ICT use in EFL contexts, research in Indonesia remains fragmented. Many studies focus on specific tools, isolated skills, or small-scale interventions, lacking a comprehensive overview of ICT's overall impact on learner motivation and language proficiency (Sabiri, 2020; Msafiri, 2023). Recent studies highlight the growing role of AI, gamification, and informal digital learning environments in enhancing motivation and language performance, yet systematic syntheses of these findings are limited (Ahmed et al., 2025; Wafa & Sulistyaningsih, 2025; Indonesian Journal on Learning and Advanced Education, 2025).

Given the digital transformation in Indonesian education, understanding the impact of ICT tools on EFL learners' motivation and language proficiency is crucial. Although studies indicate positive outcomes, there remains a lack of comprehensive synthesis specific to Indonesia, which hampers the formulation of effective teaching strategies and policy recommendations.

This systematic review aims to:

1. Identify the types of ICT tools employed in EFL learning in Indonesia.
2. Examine the effects of ICT integration on learners' motivation.
3. Evaluate the impact of ICT tools on language proficiency.
4. Investigate challenges and limitations in implementing ICT in Indonesian EFL classrooms.

By addressing these objectives, this review provides both practical guidance for educators and evidence-based recommendations for policymakers to enhance the effectiveness of ICT-enhanced EFL learning.

2. METHOD

2.1 Research Design

This study employs a systematic literature review (SLR) to examine the impact of Information and Communication Technology (ICT) tools on English as a Foreign Language (EFL) learners' motivation and language proficiency in Indonesia. The SLR provides a structured method for identifying, evaluating, and synthesizing empirical studies, allowing for evidence-based conclusions about trends in ICT integration (Zaki & Kaur, 2024; Putri Anggraini et al., 2024; Ramadhan et al., 2024; Nurhayati & Ramdhani, 2025; Fima et al., 2024). Following the PRISMA framework ensures methodological rigor, transparency, and replicability in the synthesis process (Universitas Negeri Malang, 2024; Tahmina, 2024; Sari & Fauzi, 2023).

The review focused on multiple dimensions of ICT use, including learner motivation, language skill development, and implementation challenges. The systematic review design aligns with the research objective of providing a comprehensive synthesis rather than collecting primary data (Ahmed et al., 2025; Wafa & Sulistyaningsih, 2025; Putra & Lestari, 2025; Wicaksono & Sulisty, 2023; Fitria et al., 2022).

2.2 Participants and Literature Sources

Participants are represented by studies conducted on EFL learners in Indonesia at primary, secondary, and tertiary levels. Studies included learners from diverse regions, covering urban

and rural contexts. From an initial pool of 172 records obtained from Google Scholar, ERIC, ScienceDirect, SpringerLink, and ResearchGate, 35 studies published between 2010 and 2024 were selected based on relevance and methodological quality (Fima et al., 2024; Nurhayati & Ramdhani, 2025; Putri & Lestari, 2025; Ramadhan et al., 2024; Wicaksono & Sulisty, 2023).

2.3 Instruments and Data Extraction

Data extraction involved coding each selected study based on: (1) author(s) and year, (2) type of ICT tool (e.g., mobile applications, online platforms, multimedia), (3) educational level, (4) measured outcomes (motivation, language proficiency), and (5) main findings and implications (Moradi, 2025; Ramadhan et al., 2024; Putri & Lestari, 2025; Wicaksono & Sulisty, 2023; Nurhasanah et al., 2022). Coding ensured consistency and reliability in synthesizing diverse studies.

Quality assessment considered peer-reviewed status, methodological transparency, sample size, and clarity of outcome measures. Studies without empirical data, focusing solely on teacher perceptions, or inaccessible in English/Bahasa Indonesia were excluded. Two researchers independently coded the studies, resolving discrepancies through discussion to ensure inter-rater reliability (Kusrini et al., 2025; Sari & Fauzi, 2023; Ahmed et al., 2025).

2.3 Search Strategy

The search was conducted between February and May 2025 using Boolean operators: (ICT tools OR educational technology OR digital learning OR CALL OR MALL) AND (EFL OR English as a Foreign Language) AND (motivation OR language proficiency) AND (Indonesia).

After removing duplicates and applying inclusion/exclusion criteria, 35 studies were retained. The selected studies encompassed experimental, quasi-experimental, and qualitative designs to provide a comprehensive overview of ICT implementation in Indonesian EFL contexts (Putri Anggraini et al., 2024; Nurhayati & Ramdhani, 2025).

2.4 Data Collection Procedures

Data collection involved reviewing full-text articles and extracting information based on the coding categories. Each study was analyzed for methodological details, ICT tools used, measured outcomes, and reported effects on motivation and language proficiency. Verification of outcome measures and cross-checking for consistency ensured the synthesis accurately represented the original studies (Fima et al., 2024; Ramadhan et al., 2024).

2.5 Data Analysis Techniques

The analysis focused on: (1) the impact of ICT tools on learner motivation and (2) their impact on language proficiency. Secondary analysis explored implementation challenges, including infrastructure, teacher competence, and pedagogical design (Lisia, 2024; Moradi, 2025; Nurhayati & Ramdhani, 2025).

A meta-synthesis approach combined quantitative and qualitative findings, allowing generalizable trends while preserving contextual richness (Ahmed et al., 2025; Wafa & Sulistyaningsih, 2025). This method ensured a holistic understanding of ICT effectiveness across various educational levels.

2.6 Ethical Considerations

Ethical considerations included accurate reporting, proper attribution of sources, and avoiding misrepresentation. All studies were properly cited, and findings were synthesized objectively. This review adheres to academic integrity standards and ensures conclusions are grounded in credible research evidence (Tahmina, 2024; Sari & Fauzi, 2023; Ramadhan et al., 2024).

3. RESULT AND DISCUSSION

Result

The systematic review included 35 studies examining the effects of ICT tools on EFL learners' motivation and language proficiency in Indonesia. These studies spanned primary, secondary, and tertiary education, providing a comprehensive overview of ICT integration across diverse educational levels (Fima et al., 2024; Nurhayati & Ramdhani, 2025). The most frequently used ICT tools were Learning Management Systems (LMS) such as Google Classroom and Edmodo, mobile-assisted language learning applications like Duolingo and Memrise, gamified platforms including Kahoot! and Quizizz, and multimedia tools such as YouTube, podcasts, and Canva (Putri Anggraini et al., 2024; Sari & Fauzi, 2023).

3.1 Impact on Motivation

Across the reviewed studies, ICT integration consistently improved learner motivation. For instance, Kahoot! and Quizizz were reported to enhance intrinsic motivation by creating competitive yet enjoyable learning environments, encouraging participation and sustained engagement (Sari & Fauzi, 2023; Ramadhan et al., 2024). Video-based learning, particularly through YouTube, supported affective engagement by providing authentic contexts for communication, which fostered curiosity and confidence among learners (Wafa & Sulistyaningsih, 2025; Nurhayati & Ramdhani, 2025).

At the tertiary level, LMS platforms enabled flexible access to materials, immediate feedback, and autonomous learning opportunities, which further reinforced motivation (Fima et al., 2024). Several studies reported that the combination of gamified learning and multimedia-based instruction contributed to integrative motivation, helping students feel connected to the global English-speaking community, and instrumental motivation by highlighting English's utility for academic and career purposes (Tahmina, 2024; Putri Anggraini et al., 2024).

However, some studies noted that motivation could decrease when technological novelty diminished or when tasks were poorly designed, emphasizing the importance of sustained teacher guidance and pedagogical creativity (Moradi, 2025; Ramadhan et al., 2024).

3.2 Effects on Language Proficiency

ICT tools also positively influenced multiple dimensions of language proficiency. Vocabulary acquisition benefited most from mobile-assisted applications like Duolingo, Memrise, and Wordwall, which provided repeated exposure to target vocabulary in engaging formats (Ahmed et al., 2025; Sari & Fauzi, 2023; Putri & Lestari, 2025; Wicaksono & Sulisty, 2023; Nurhasanah et al., 2022). Writing proficiency improved significantly in settings that utilized online collaborative tools such as Google Docs, where students could receive peer and instructor feedback in real time, resulting in higher accuracy, coherence, and fluency (Putri Anggraini et al., 2024; Ramadhan et al., 2024; Ahmad et al., 2022; Fitria & Kurniawan, 2023).

Listening and speaking skills were enhanced through podcasts, YouTube videos, and other audiovisual resources, exposing learners to authentic language input and intonation patterns (Wafa & Sulistyarningsih, 2025; Nurhayati & Ramdhani, 2025; Hartatik & Supriyadi, 2023; Lestari & Nugroho, 2022). Reading comprehension was supported by e-books and digital reading platforms, which promoted extensive reading habits and critical thinking (Ramadhan et al., 2024; Fima et al., 2024; Putra et al., 2023). Overall, ICT tools functioned as mediators that facilitated both input and output practice, consistent with communicative language acquisition theories (Ahmed et al., 2025; Zaki & Kaur, 2024; Wicaksono & Sulisty, 2023).

3.3 Implementation Challenges

Despite the positive outcomes, several studies highlighted persistent challenges. Teacher digital competence remained a major barrier; many educators lacked training in effective ICT integration, limiting pedagogical effectiveness (Moradi, 2025; Kusriani et al., 2025). Infrastructure issues, including unreliable internet connectivity and limited access to devices, particularly in rural areas, created inequities in ICT access (Lisia, 2024; Ramadhan et al., 2024). Curriculum misalignment also limited the impact of ICT, as digital tools were frequently used as supplemental resources rather than core components of instruction (Putri Anggraini et al., 2024; Fima et al., 2024).

Although most studies employed qualitative and quasi-experimental designs, some reported quantitative outcomes. For example, studies measuring motivation using standardized scales found mean scores increased significantly after ICT interventions (pretest $M = 3.12$, $SD = 0.48$; posttest $M = 4.05$, $SD = 0.39$; $p < .01$) (Ramadhan et al., 2024; Nurhayati & Ramdhani, 2025). Similarly, writing accuracy and vocabulary retention demonstrated measurable improvements, with effect sizes ranging from moderate to large ($d = 0.57$ – 0.82) following ICT-based interventions (Sari & Fauzi, 2023; Ahmed et al., 2025).

The reviewed evidence indicates that ICT tools contribute to enhanced motivation, engagement, and language proficiency across multiple skills. Tools such as gamified learning applications, LMS platforms, mobile-assisted language learning apps, and multimedia resources collectively foster an interactive, learner-centered environment. Nevertheless, effective implementation depends on teacher readiness, infrastructure quality, and curriculum alignment (Tahmina, 2024; Moradi, 2025; Wafa & Sulistyarningsih, 2025).

Discussion

The present systematic review aimed to synthesize evidence regarding the impact of Information and Communication Technology (ICT) tools on EFL learners' motivation and language proficiency in Indonesia. The findings indicate that ICT integration has consistently positive effects on learners' engagement, autonomy, and skill development. This section interprets these results, compares them with recent studies, explores possible explanations, and highlights theoretical and practical implications.

The review demonstrates that gamified learning platforms, mobile-assisted applications, LMS platforms, and multimedia tools significantly improve learner motivation. Tools such as Kahoot!, Quizizz, Duolingo, and YouTube create interactive, enjoyable learning experiences that sustain student engagement (Sari & Fauzi, 2023; Ramadhan et al., 2024). Intrinsic motivation increases when learners participate in competitive or collaborative digital tasks, while instrumental motivation is strengthened by awareness of the utility of English for academic and career purposes (Tahmina, 2024; Putri Anggraini et al., 2024).

The effect on language proficiency is also noteworthy. Mobile-assisted language learning applications provide repeated exposure to vocabulary and grammar, enhancing retention and comprehension (Ahmed et al., 2025). Writing skills improve through collaborative online platforms like Google Docs, where learners receive real-time feedback that enhances accuracy, coherence, and fluency (Ramadhan et al., 2024; Putri Anggraini et al., 2024). Listening and speaking abilities are supported by authentic multimedia input, including podcasts and videos, which provide exposure to natural intonation and pronunciation (Wafa & Sulistyaningsih, 2025). Reading comprehension benefits from e-books and digital reading platforms, encouraging extensive reading and critical engagement with texts (Fima et al., 2024; Nurhayati & Ramdhani, 2025).

Quantitative outcomes in the reviewed studies indicate statistically significant gains in motivation and language proficiency. For instance, post-intervention motivation scores were higher than pre-intervention measures ($M = 4.05$, $SD = 0.39$, $p < .01$), and vocabulary retention and writing accuracy demonstrated moderate to large effect sizes ($d = 0.57$ – 0.82) (Sari & Fauzi, 2023; Ahmed et al., 2025). These results suggest that ICT tools function as mediators facilitating both input and output practice, supporting communicative competence in line with Krashen's Input Hypothesis and Swain's Output Hypothesis, adapted to contemporary digital environments (Zaki & Kaur, 2024).

The positive effects observed in Indonesia align with global findings on ICT in EFL contexts. International studies have similarly reported increased motivation and engagement through gamified learning, LMS usage, and multimedia input (Moradi, 2025; Fima et al., 2024). Compared with traditional methods, ICT-supported environments promote learner autonomy, self-paced learning, and authentic exposure, which are crucial for language acquisition (Tahmina, 2024; Ahmed et al., 2025).

However, challenges remain, consistent with earlier literature emphasizing the digital divide, teacher competence, and curriculum integration (Kusrini et al., 2025; Lisia, 2024). Rural schools with limited access to devices and unstable internet connections face significant barriers, resulting in inequitable learning opportunities. Similarly, teachers lacking digital pedagogical skills often implement ICT superficially, limiting its potential impact (Moradi, 2025; Ramadhan et al., 2024). These challenges echo previous findings but are exacerbated

by rapid digitalization initiatives such as *Merdeka Belajar* and national digital learning programs, which may outpace teacher training and infrastructural readiness (Putri Anggraini et al., 2024; Wafa & Sulistyarningsih, 2025).

The effectiveness of ICT tools can be attributed to several factors. First, the interactivity and gamification of digital tools foster sustained engagement and intrinsic motivation (Sari & Fauzi, 2023; Ramadhan et al., 2024). Second, mobile-assisted and multimedia applications provide frequent, context-rich language exposure, aligning with input-rich language acquisition models (Ahmed et al., 2025). Third, LMS platforms facilitate self-regulated learning, offering autonomy, immediate feedback, and flexibility (Tahmina, 2024; Nurhayati & Ramdhani, 2025).

Moreover, ICT tools allow for personalized and adaptive learning experiences, accommodating individual differences in proficiency, learning pace, and interest (Fima et al., 2024; Moradi, 2025). Such personalization is particularly valuable in EFL contexts where exposure to authentic English is limited outside the classroom. The combination of motivational, cognitive, and affective benefits explains the observed improvements in both learner engagement and linguistic competence.

This review reinforces several theoretical frameworks in second language acquisition (SLA). The observed improvements in motivation support Dörnyei's L2 Motivational Self System, demonstrating that integrative, instrumental, and intrinsic motivation are enhanced through ICT-mediated learning (Tahmina, 2024; Putri Anggraini et al., 2024). The findings also corroborate communicative competence models, highlighting the importance of both comprehensible input and meaningful output (Ahmed et al., 2025; Zaki & Kaur, 2024).

From an educational technology perspective, the results provide empirical evidence supporting constructivist and learner-centered pedagogical models, where learners actively construct knowledge through interactive and collaborative ICT-based experiences (Sari & Fauzi, 2023; Ramadhan et al., 2024).

For educators, the findings suggest that ICT tools should be integrated purposefully, with careful attention to pedagogical design and alignment with curriculum objectives. Teacher professional development programs must prioritize digital literacy, instructional design, and adaptive teaching strategies to maximize the effectiveness of ICT interventions (Kusrini et al., 2025; Moradi, 2025).

Policy-wise, equitable access to infrastructure and devices is critical to reduce disparities between urban and rural contexts. Governments and educational institutions should ensure reliable internet connectivity, device availability, and institutional support to sustain ICT-based learning initiatives (Lisia, 2024; Fima et al., 2024).

Finally, ICT-based pedagogy can be embedded within the *Kurikulum Merdeka* framework to promote student-centered learning, autonomy, and active participation. Emerging technologies such as AI-powered feedback, adaptive learning platforms, and virtual reality offer promising avenues for enhancing motivation and language outcomes, warranting further investigation (Ahmed et al., 2025; Wafa & Sulistyarningsih, 2025).

4. CONCLUSION

This review confirms that ICT tools positively influence EFL learners' motivation and language proficiency in Indonesia. Gamified platforms, mobile-assisted applications, LMS, and multimedia resources enhance engagement, autonomy, and communicative competence across multiple language skills. However, effective implementation depends on teacher digital competence, reliable infrastructure, and curriculum alignment. Disparities between urban and rural schools and limited pedagogical training remain challenges. Educators should integrate ICT thoughtfully, while policymakers ensure professional development and equitable access. Future studies should explore emerging technologies, including AI and virtual reality, to sustain motivation and language outcomes, maximizing ICT's potential in Indonesian EFL education.

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