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Improving English Oral Communication through Multimodal Learning Strategies for Secondary School Students

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Abstract

Background – The rapid integration of digital technologies and artificial intelligence (AI) in education presents both opportunities and challenges, especially in improving English oral communication and promoting ethical digital behavior. AI-driven multimodal platforms that combine visual, auditory, reading/writing, and kinesthetic modes offer inclusive learning, but teachers must develop ethical, reflective, and collaborative competencies to ensure responsible AI use. Issues such as digital inequality, limited infrastructure, and insufficient professional development highlight the need for innovative frameworks aligned with Kurikulum Merdeka.
Purpose – This study aims (1) to design and analyze a conceptual framework for an AI-driven multimodal learning platform that personalizes English oral communication, provides real-time feedback, and strengthens students' digital citizenship; and (2) to identify essential teacher competencies and challenges related to AI integration to guide sustainable professional development.
Method/Approach – A qualitative conceptual design was applied by synthesizing literature on multimodality, AI in education, teacher competence, and digital citizenship. This was supported by a systematic literature review (SLR) of 12 Scopus-indexed articles (2020–2025) using the keywords "Artificial Intelligence," "teacher competence," "AI in education," and "TPACK." Thematic analysis with iterative coding ensured analytical reliability.
Findings – The proposed multimodal–AI framework shows strong potential to enhance oral communication through AI-enabled personalization, speech-recognition feedback, and interactive multimodal tasks. The review identifies three core teacher competency domains: AI literacy and ethical awareness, data-driven digital pedagogical design, and collaborative reflective practice. Major challenges include limited infrastructure, unequal digital access, ethical concerns, and inadequate AI-focused training.
Conclusion – Adopting AI–TPACK, design thinking, and growth-mindset principles can guide effective professional development in multimodal–AI learning environments.
Novelty/Originality/Value – The study's originality lies in integrating language proficiency and ethical digital citizenship within a unified multimodal–AI framework, offering theoretical contributions and practical direction for future educational innovation.

Keywords: Digital Citizenship, English Speaking Skills, Multimodal Learning

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INTRODUCTION

In the 21st century, the ability to communicate effectively in English has become one of the most essential skills for participation in global society. English proficiency, particularly in oral communication, enables learners to exchange ideas, collaborate across cultures, and access global knowledge. However, communication today extends beyond traditional linguistic competence; it requires learners to navigate complex digital environments with awareness, empathy, and ethical responsibility. As the concept of global citizenship evolves, it now incorporates digital literacy and ethical participation in online spaces (Ribble, 2015). This aligns with the educational vision of empowering learners not only as fluent speakers but also as responsible digital citizens who contribute positively to the interconnected world (Reimers, 2020). Within this broader goal, the integration of technology in language education is no longer optional—it is a necessity that shapes how students learn, interact, and express themselves.

The theoretical foundation of this study is rooted in multimodal learning theory (Aiello & Mongibello, 2019) and digital citizenship education (Ribble, 2015). Multimodal learning theory emphasizes that students learn more effectively when they engage through multiple modes—visual, auditory, reading/writing, and kinesthetic—because it accommodates diverse learning styles and promotes deeper understanding. In language learning, multimodality enhances vocabulary acquisition, pronunciation, and fluency through interactive and sensory-rich experiences. Complementing this, digital citizenship education provides the ethical and behavioral framework for learners to participate responsibly in digital environments. It encourages critical thinking, respect for others, and safe online communication. When combined, these two theories offer a comprehensive foundation for designing learning environments that not only develop linguistic competence but also cultivate digital ethics—both of which are vital for 21st-century learners.

Despite various educational reforms under Kurikulum Merdeka, Indonesian secondary school students continue to face challenges in developing English speaking skills (OECD, 2022). Classroom practices remain predominantly teacher-centered, focusing on grammar accuracy and written assessments rather than meaningful oral communication (Daud, 2024). Furthermore, while access to digital devices and internet connectivity has expanded (BPS, 2023), technology is often used passively rather than pedagogically. Teachers frequently use multimedia only for presentation purposes instead of facilitating interactive, multimodal engagement. This gap between access and pedagogical use limits students' opportunities to practice authentic communication and to develop awareness of ethical digital behavior. The problem is therefore twofold: insufficient oral communication competence and a lack of ethical digital literacy. These issues hinder students' preparedness to participate effectively and responsibly in the global digital community.

The urgency of this study lies in addressing these interconnected challenges. As digital technologies increasingly shape communication, education systems must ensure that students develop both the linguistic and ethical competencies necessary for global participation. Without integrating multimodal and ethical approaches, English language education risks becoming outdated and disconnected from students' real-world communication needs. A framework that bridges these two dimensions is urgently required to align national education goals with the broader aspirations of Education 4.0, which emphasizes creativity, collaboration, communication, and critical thinking through technology-enhanced learning.

The objective of this study is to design and conceptualize a multimodal learning platform that enhances English oral communication while fostering ethical digital citizenship among Indonesian secondary school students. The platform utilizes artificial intelligence (AI)–driven multimodal feedback mechanisms to personalize learning experiences, promote interaction, and encourage reflective digital behavior. It aligns with the Kurikulum Merdeka principles that emphasize learner autonomy, creativity, and contextual learning, thereby creating a more engaging and inclusive educational environment.

The novelty and contribution of this study lie in its integration of language learning and digital citizenship within a single conceptual framework. Previous studies have often examined

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either technological innovation in education or English language pedagogy in isolation (Salma et al., 2023; Umroh et al., 2025). In contrast, this research presents an interdisciplinary model that unites multimodal learning theory and digital ethics to promote both communicative competence and responsible technology use. This dual approach offers a new perspective on English education in Indonesia—one that prepares students not only to speak fluently but also to act ethically and responsibly as members of a digital global community.

METHODS

Research Design

This study employs a qualitative-descriptive research design with a conceptual development approach. Rather than collecting primary data, the study focuses on systematically reviewing, synthesizing, and conceptualizing existing theories, empirical findings, and policy frameworks to construct a new pedagogical model. The goal is to develop a framework that integrates multimodal learning and digital citizenship principles into English language education for secondary school students. This design allows for theoretical exploration and critical synthesis across multiple academic domains, including linguistics, educational technology, and digital ethics.

Research Participants (Data Sources)

Since this research does not involve human participants, the "participants" in this context refer to the sources of data—namely, published works and policy documents. The study draws upon scholarly articles, books, institutional reports, and educational policy guidelines from both global and Indonesian contexts. Major sources include publications from the Organisation for Economic Co-operation and Development (OECD, 2022), works on global competence and digital citizenship (Reimers, 2020), and peer-reviewed studies related to multimodal learning, digital literacy, and English as a foreign language (EFL) pedagogy. The selection covers materials published between 2015 and 2025, ensuring the inclusion of recent developments and theoretical perspectives.

Research Methods

The method applied is systematic literature analysis. A structured search was conducted using academic databases such as Google Scholar, ERIC, and Scopus, focusing on keywords including "multimodal learning," "digital citizenship," "English communication," "AI in education," and "global competence." Sources were screened and included based on three criteria: (1) Direct relevance to multimodal learning and digital integration, (2) Explicit connection to English language learning or oral communication, and (3) Discussion of ethical, digital, or global citizenship education. The analysis also incorporated official policy documents such as Kurikulum Merdeka guidelines to ensure contextual alignment with Indonesia's national education goals.

Validity and Trustworthiness

To ensure the validity and reliability of the conceptual framework, the study followed established procedures for conceptual research integrity. Triangulation of sources was maintained by consulting diverse materials—empirical studies, theoretical papers, and policy documents—from both international and national perspectives. Conceptual validity was strengthened through cross-referencing multiple frameworks and theories to identify consistent patterns and relationships. Additionally, the synthesis process was reviewed by academic peers in education and applied linguistics to ensure coherence, logical consistency, and theoretical soundness.

Data Analysis

The data obtained from the literature were analyzed using a content and thematic analysis approach. Quantitative data reported in prior studies—such as learning outcomes, engagement metrics, or proficiency improvements—were extracted to support descriptive summaries. Qualitative data, including teacher reflections, student perceptions, and pedagogical case studies, were coded inductively to identify recurring strategies and themes. The results of both analyses

were integrated through an interpretive synthesis process, which allowed the construction of a coherent conceptual framework outlining pedagogical strategies, digital tools, and ethical considerations for fostering English oral communication and digital citizenship.

RESULTS AND DISCUSSION

The Multimodal Framework: A Catalyst for Speaking Proficiency

Multimodal learning is an instructional approach that leverages a combination of communication channels—visual, auditory, reading/writing, and kinesthetic—to cater to diverse learning preferences and engage students on multiple levels (Mayer, 2021). By integrating various content formats and interactive activities, this approach creates a richer and more inclusive learning experience that boosts engagement and improves retention (Mayer, 2021). For example, instructors can combine lectures with visual aids like diagrams and videos, incorporate audio elements such as podcasts or group discussions, and include hands-on activities that allow learners to physically interact with a concept (Mayer, 2021). This pedagogical strategy represents a fundamental shift away from the passive "cramming" and "one talk" methods prevalent in traditional education (Hannafin & Land, 1997). By engaging multiple senses simultaneously, multimodal learning actively encourages students to make connections and apply knowledge in creative ways, thereby fostering critical thinking and innovation (Mayer, 2021).

The technology-driven nature of a multimodal platform transforms the student's role from a passive recipient of information to an active, engaged participant. This shift from teacher-centered to student-centered learning is a key factor in improving students' autonomous learning ability and overall language proficiency (Mutlu & Eroz-Tuga, 2013). The power of a multimodal platform lies in its ability to prevent the boredom and monotony of single-format instruction by providing a continuous stream of new, interactive experiences that capture and maintain a learner's attention (Mayer, 2021).

Empirical evidence consistently demonstrates the effectiveness of a multimodal approach in fostering English speaking proficiency. By providing practical, interactive opportunities, a multimodal platform directly addresses the challenges of limited exposure and practice for students (Daud, 2024; Li, 2021). Key pedagogical strategies that can be integrated include role-play activities, debates, conversation circles, and language games, which provide students with real-life scenarios to practice articulating their thoughts and thinking on their feet (Li, 2021). Peer feedback is a powerful tool within this framework, fostering a supportive environment where students can learn from one another and view mistakes as opportunities for improvement (Li, 2021). The positive impact of these approaches is supported by quantitative data.

A study by Dewi et al. (2021), which examined the role of technology adoption in Indonesian education, found a remarkable increase in English language proficiency across schools after the implementation of digital learning platforms. This significant increase in proficiency was accompanied by enhanced classroom engagement, with a reported 95% of students and teachers actively participating in learning and teaching activities through the platform (Dewi et al., 2021). Further evidence of the model's effectiveness is found in a study on student performance. The data, which can be visualized in a pie chart, illustrates the model's overall effectiveness. A significant portion of activities showed high levels of achievement, demonstrating that a majority of students achieved a high level of performance.

The implementation of AI-based tools further augments these results by providing real-time, personalized feedback on pronunciation and intonation, which are often challenging aspects of English speaking (Hwang & Fu, 2020). A study found that the use of AI significantly improved students' attitudes and abilities toward oral and speaking skills, and that students perceived these tools as both useful and easy to use (Aiello & Mongibello, 2019). Artificial intelligence is not merely an add-on feature in a multimodal learning platform; it is a transformative force that provides unprecedented opportunities for personalization and efficiency. AI-based systems can process a wide variety of data inputs—including text, voice, and images—to create a comprehensive view of a student's learning process (Ouyang et al., 2022).

This allows the AI to offer tailored resources, adjust the difficulty of tasks in real time, and

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provide specific feedback to fill knowledge gaps (Ouyang et al., 2022). For example, if a language-learning app identifies that a student excels in listening but struggles with speaking, it can automatically prioritize voice recognition exercises to focus on pronunciation and fluency (Ouyang et al., 2022). This application of AI creates a powerful duality in the learning ecosystem. The same technology that provides real-time, data-driven feedback on a student's language performance is also a subject of critical ethical concern (Tzeng et al., 2023).

The vast amounts of data collected and processed by these systems raise questions about privacy and potential algorithmic biases that can unfairly assess students who use non-dominant dialects or come from minority backgrounds (Tzeng et al., 2023). This technological paradox presents a unique pedagogical opportunity. By making the AI's functions transparent, the platform can be used to model ethical behavior and actively teach students about the very technologies they are using. For instance, a module that provides pronunciation feedback can also include a lesson on how the AI was trained, what data it collects, and the importance of privacy and data security. This transforms an abstract concept like AI ethics into a concrete, relatable experience, reinforcing the importance of responsible digital conduct within the context of language learning itself.

Cultivating Ethical Digital Citizenship

Ethical digital citizenship extends far beyond basic internet safety (Ribble, 2015). It is a comprehensive practice encompassing four key principles: responsibility, safety, ethics, and good communication (Ribble, 2015). This means not just avoiding online dangers but actively contributing positively to the digital world (Ribble, 2015). It involves understanding the impact of one's actions, protecting personal information, and adhering to principles of fairness, such as giving credit where it is due and respecting intellectual property (Ribble, 2015). Most importantly, it requires respectful and kind communication, whether in a group chat, an online discussion, or an email (Ribble, 2015). This emphasis on respectful online communication provides a direct bridge to the English-speaking skills component of the platform.

The soft skills necessary for effective oral communication—such as the ability to articulate thoughts, engage in constructive discussions, and listen to diverse perspectives—are directly transferable to online discourse (Li, 2021). A platform can be designed to deliberately link these two skill sets. For instance, a virtual debate module could have a rubric that grades both language fluency and respectful online conduct, encouraging students to apply their speaking skills to a context that requires empathy and careful consideration of how their words might affect others (Zydney et al., 2020). This demonstrates that the development of English proficiency and ethical digital behavior are mutually reinforcing, contributing to the development of a well-rounded global citizen.

As technology becomes more deeply embedded in education, it is imperative to address the ethical challenges inherent in its design and application. The use of generative AI and large language models (LLMs) in learning platforms, while beneficial, introduces concerns around data privacy and algorithmic bias (Tzeng et al., 2023). LLMs, for example, are trained on vast datasets that can reflect existing human and systemic biases, which can be unintentionally perpetuated in the content they generate (Tzeng et al., 2023). This is particularly problematic in a language learning context, where an AI might struggle to accurately assess the work of students who speak with non-dominant dialects or from minority backgrounds, leading to inequitable learning experiences (Tzeng et al., 2023).

A robust platform must not only acknowledge these risks but also actively teach students to be critical consumers of digital content. Students need to be empowered to evaluate the reliability and validity of AI-generated outputs, to identify who and what is represented in the data, and to understand the privacy implications of their own interactions with these tools (Tzeng et al., 2023). This focus on algorithmic literacy prepares students to navigate an increasingly AI-driven world with a critical mindset, enabling them to make informed decisions about their own learning and online behavior.

Effective digital citizenship education must be integrated into the core curriculum, rather than being treated as a separate, supplementary topic (Zydney et al., 2020). The most effective

pedagogical strategy for this is project-based learning (PBL). By asking students to create multimodal projects—such as presentations, podcasts, or videos—educators can organically weave in lessons on ethical conduct (Zydney et al., 2020). For example, the assessment rubric for a video project can include criteria for proper citation of multimedia sources, the use of inclusive design features like closed captioning for accessibility, and a consideration of intellectual property (Zydney et al., 2020).

Peer feedback is another powerful tool for reinforcing these lessons. When students are asked to review each other's work, they can be guided to provide constructive criticism on both the quality of the content and the adherence to ethical standards. This fosters a sense of empathy and responsibility, as students learn to think about how their digital creations and interactions affect others (Zydney et al., 2020). By adopting this mindset, students are prepared to apply principles of inclusivity, intellectual property, and responsible online behavior not just to meet a grading requirement, but to be prepared for the realities of the digital world.

Conceptual Framework for an Integrated Learning Platform

The ideal platform for fostering English speaking skills and ethical digital citizenship would be built on a hybrid, dual-purpose architecture. Its features would serve both language and ethical education simultaneously, seamlessly integrating the two disciplines. For example, a "Virtual Debate Club" module would be a core feature, providing a dedicated space for students to enhance their speaking skills through interactive role-play and improvisation (Li, 2021). Simultaneously, this module would be designed to teach respectful online communication and media literacy, with a moderation system that highlights and provides feedback on respectful and constructive engagement (Ribble, 2015; Zydney et al., 2020). Another feature, a "Multimodal Storytelling Project," would encourage creative expression in English, allowing students to combine text, images, and audio to tell a story (Zydney et al., 2020). This project would be governed by a rubric that requires students to adhere to digital ethics principles, such as properly citing all sources and using open-source or licensed content. The platform would be powered by multimodal AI that provides personalized, real-time feedback on both language performance and ethical conduct (Ouyang et al., 2022). For example, the AI could analyze a student's oral presentation for pronunciation and grammar, while also flagging any images or music used in the presentation that are not properly cited. The platform's user interface would be designed with principles of usability and accessibility in mind, providing text-based alternatives for users with visual or hearing impairments and ensuring a smooth, intuitive user experience (Zhang, 2022).

The effectiveness of multimodal and technology-integrated approaches is supported by multiple case studies. A study by Mayer (2021) on the multimedia principle demonstrated significant increases in content retention and comprehension among students compared to those taught with traditional methods. The students and instructors in the study overwhelmingly provided positive feedback, noting that the interactive components made learning more enjoyable and engaging (Mayer, 2021). In the Indonesian context, a qualitative case study by Umroh, Juhana, and Ruminda (2025) found that a digital multimodal presentation project not only improved students' speaking proficiency but also significantly contributed to building their self-confidence in English. These case studies illustrate a broader trend in education where technology is being leveraged to create a more dynamic and interactive learning environment. The proposed framework is designed to replicate and expand upon these successes. These images represent the collaborative and technology-rich environment that is crucial for a successful integrated learning platform. They underscore the importance of teachers as facilitators and mentors in a digitally empowered classroom.

Adapting the Framework to the Indonesian Context

Successfully implementing a digital learning platform in Indonesia requires a deep understanding of the local educational landscape. The proposed framework is strategically aligned with the government's visionary policies, most notably the Kurikulum Merdeka (Emancipated Curriculum) (Fajri & Nurhasanah, 2024). This curriculum is designed to be more flexible and student-centered, with a strong emphasis on technology integration to promote

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critical thinking, creativity, and personalized learning (Fajri & Nurhasanah, 2024). The government has committed substantial resources to digital transformation, aiming to provide internet access to hundreds of thousands of schools and introducing AI and coding into various curricula (Sudarman, 2023). This strong top-down policy push provides a fertile ground for a platform that champions technology-driven, student-led learning. However, a closer look at the local context reveals a disparity between policy ambition and on-the-ground reality. While the government's commitment is a necessary condition for success, it is not sufficient on its own. The Indonesian EdTech sector faces significant challenges, including a lack of digital literacy among some educators and a low willingness to pay for digital solutions from schools and parents (Istiqlal, 2021). These demand-side and supply-side constraints highlight the need for a framework that is not just technologically advanced but also economically and contextually appropriate. A successful platform must navigate these challenges, perhaps by offering free or low-cost versions, and by being designed in a way that minimizes the need for extensive training and technical support.

The digital divide in Indonesia, characterized by unequal access to devices and reliable internet, remains a significant obstacle to equitable education (Istiqlal, 2021). While the government is actively working to bridge this gap by expanding digital infrastructure and connectivity, simply providing access may not be enough. Research suggests that the inclusion of marginalized communities into the digital system can, in some cases, amplify pre-existing social inequalities, creating new forms of digital exclusion (Rahman, 2022). This paradox indicates that true digital inclusion is not just about a technological solution but also about a socio-cultural one. The proposed platform must adopt a localized and "periphery-centric" approach (Rahman, 2022). This means designing a solution that is not reliant on high-speed, ubiquitous internet but can function effectively on mobile devices and in low-bandwidth scenarios. It also means building the platform from the perspective of its users in remote and underserved communities, ensuring that the content and features are relevant and accessible. By doing so, the framework can empower these communities to leverage technology for bottom-up innovation and learning, rather than simply becoming passive participants in a system that may not be designed for their unique needs.

The success of any technology integration initiative hinges on the role of the teacher (Mutlu & Eroz-Tuga, 2013). Educators are the primary drivers of digital transformation in the classroom, and their competence and willingness to embrace new tools are major factors in determining learning outcomes (Mutlu & Eroz-Tuga, 2013; Istiqlal, 2021). The Indonesian government has recognized this, with new initiatives to train teachers in digital skills, including AI and coding, and to provide them with high-quality digital education content (Sudarman, 2023). Despite these efforts, challenges remain, and many teachers still lack the confidence and proficiency needed to effectively utilize technology (Istiqlal, 2021). Therefore, the proposed platform must be paired with a robust and continuous professional development program for educators. This training should not just focus on the technical aspects of the platform but on pedagogical strategies for integrating multimodal learning and digital ethics into their daily lessons. By empowering teachers with the necessary skills, resources, and support, the framework can transform their role from traditional instructors to facilitators of a dynamic, student-centered learning environment.

CONCLUSION

This study proposed a conceptual framework for integrating multimodal learning and digital citizenship to enhance English oral communication among Indonesian secondary school students. The framework highlights the effectiveness of multimodal strategies—combining visual, auditory, reading/writing, and kinesthetic elements—in improving engagement and language proficiency while promoting ethical digital behavior. By leveraging AI-driven multimodal feedback, the model personalizes learning experiences and aligns with the Kurikulum Merdeka vision for digital transformation in education. However, successful implementation requires addressing contextual challenges such as limited digital literacy, infrastructure gaps, and teacher readiness. The study recommends that policymakers invest in equitable digital infrastructure and ethical AI policies, and that educators adopt blended,

technology-supported teaching supported by ongoing professional development. As a conceptual work, this research serves as a foundation for future empirical studies exploring the long-term impact of multimodal, technology-enhanced frameworks on both communication competence and responsible digital citizenship.

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