

CHATGPT AND GOOGLE GEMINI IN EFL EDUCATION: A QUALITATIVE EXPLORATION OF PEDAGOGICAL EFFICACY AMONG INDONESIAN SOPHOMORES

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Article Info	Abstract
Article History Received: January 2023 Revised: April 2024 Published: January 2025	<i>As generative language models like ChatGPT and Google Gemini gain prominence in education, their efficacy in specific contexts, such as Indonesian English as a Foreign Language (EFL) instruction, still needs to be explored. This study investigates the pedagogical affordances and constraints of these models as perceived by Indonesian EFL sophomores, aiming to understand their contribution to active learning in language acquisition. Using a qualitative approach, we conducted open-ended questionnaires with 40 sophomore students from an Indonesian university's English department. Thematic content analysis was employed to analyse the data. Findings reveal that ChatGPT offers authentic conversational simulations and versatile content-based instruction, while Google Gemini's strength lies in its multilingual capabilities. However, limitations such as linguistic complexity and rigid conversational structures were also identified. The study suggests these models can enhance active learning experiences, particularly in conversational practice and interdisciplinary content exploration, though their efficacy depends on factors like learner proficiency and internet access. We conclude that integrating these models into EFL instruction requires careful consideration of their affordances and limitations. This study contributes culturally-specific insights to AI in education research, with implications for curriculum designers, educators, and policymakers in developing countries, emphasising the need for adaptive and inclusive approaches in AI-enhanced EFL education.</i>
Keywords Active Learning; ChatGPT; EFL Instruction; Google Gemini; Qualitative Methodology	
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INTRODUCTION

The educational landscape is profoundly transformed and driven by the rapid advancement of artificial intelligence (AI) technologies (Abulibdeh et al., 2024; Baskara, 2023; Strielkowski et al., 2024). This evolution is particularly evident in language education, in which innovative pedagogical tools are emerging at an unprecedented pace (Chang et al., 2022; Ouyang & Jiao, 2021). These AI-driven advancements reshape instructional methods that offer unparalleled opportunities for personalised and interactive learning experiences in language acquisition (Nuankaew, 2022; Ree & Koh, 2017).

The integration of AI in education has ushered in a new era of teaching and learning approaches, characterised by adaptive learning systems, intelligent tutoring, and data-driven decision-making (Benkhalfallah et al., 2024; Guettala et al., 2024; Sajja et al., 2024). This shift is not merely a technological upgrade but a fundamental reimagining of how knowledge is disseminated and acquired in the digital age (Holmes et al., 2019). Among myriad technological developments, generative language models, particularly ChatGPT by OpenAI and Google Gemini by Google, have emerged as transformative agents in educational

engagement (Au Yeung et al., 2023; Rana, 2023; Zuccon & Koopman, 2023). These sophisticated AI models, characterised by their complex architectures and multilayered functionalities, offer more than vast information repositories. They provide interactive platforms capable of simulating human-like linguistic interactions, thereby transcending the role of passive information sources to become active facilitators of experiential learning (Gozalo-Brizuela & Garrido-Merchán, 2023; Megahed et al., 2024).

The potential of these generative language models in education is significant. They can provide instant, contextually relevant responses to learner queries, offer personalised explanations tailored to individual learning styles, and engage in simulated conversations to enhance language practice. This level of interactivity and personalisation has been previously unattainable in traditional educational settings, marking a significant leap forward in educational technology capabilities (Crawford et al., 2023; Pavlik, 2023). However, despite the burgeoning literature on AI in education, a notable gap remains in our understanding of how these generative language models specifically contribute to English as a Foreign Language (EFL) education, particularly in diverse cultural contexts such as Indonesia (Basaffar, 2017; Komara & Tiarsiwi, 2021; Saputra, 2022). While numerous studies have explored the general applicability of AI in language education, there is limited research on the pedagogical efficacy of ChatGPT and Google Gemini among Indonesian EFL learners (Murphy, 2014; Zuccon & Koopman, 2023; Rohiyatussakinah, 2021).

This research gap is particularly significant, given Indonesia's unique linguistic and cultural landscape. As one of the most linguistically diverse countries in the world with over 700 indigenous languages, Indonesia presents a complex environment for EFL education (Cohn & Ravindranath, 2014). The potential of AI-powered language models to navigate this complexity and provide culturally sensitive language instruction needs to be explored.

To address this gap, our study poses two critical research questions.

1. How do Indonesian EFL sophomores perceive and experience their interactions with ChatGPT and Google Gemini during their language learning journey?
2. What do these language models offer specific pedagogical affordances and constraints in Indonesian EFL education?

The significance of this study is that it is multifaceted. First, it allows for the exploration of a demographic that has remained on the periphery of mainstream research on AI in education. By focusing on Indonesian EFL sophomores, this study offers valuable cultural and pedagogical insights that can enrich broader discourse on active learning in linguistically diverse settings. Second, this study seeks to make a substantive contribution to theories of active learning in higher education. Through a nuanced examination of how generative language models like ChatGPT and Google Gemini facilitate or constrain active learning, the study aims to extend existing pedagogical frameworks (Gozalo-Brizuela & Garrido-Merchán, 2023; Rana, 2023). This endeavour is crucial given the rapid advancements in educational technology and the increasing adoption of AI tools in classrooms globally (Dimitriadou & Lanitis, 2023; Paek & Kim, 2021). Third, operating at the intersection of technology and pedagogy, this study aimed to offer actionable insights for instructional designers, educators, and policymakers. By identifying the specific affordances and limitations of ChatGPT and Google Gemini, this study provides empirical data that can guide future pedagogical interventions and technological refinement in higher education settings (Megahed et al. 2024; Zuccon & Koopman 2023).

Furthermore, this study adopts a qualitative methodology, recognising the importance of capturing nuanced, subjective experiences in understanding educational phenomena. By leveraging open-ended questionnaires and thematic content analysis, this study aims to provide rich, context-specific insights into how learners interact with and perceive advanced AI tools (Braun & Clark, 2006; Pavlik, 2023; Yang & Laki, 2023).

The potential for interdisciplinary impacts further underscores the importance of this research. While centred on language education, the findings could offer implications for other domains within higher education, extending its reach beyond the confines of EFL pedagogy (Fiorella & Mayer, 2016; Crawford et al., 2023). As AI continues to permeate various academic disciplines, insights from language education could inform the integration of AI tools in other fields, from STEM to humanities. Moreover, this research is timely, given the increasing global focus on digital literacy and 21st-century skills. As educational systems worldwide grapple with preparing students for a rapidly evolving digital landscape, understanding how advanced AI tools can be effectively integrated into language learning has become crucial (Taghizadeh & Yourdshahi, 2020).

The structure of this scholarly investigation systematically unfolds. We begin with a detailed methodology section describing the research design, participant sampling, data collection techniques, and analytical procedures. This is followed by a presentation of our research findings, offering a comprehensive view of how Indonesian EFL sophomores interact with, and perceive, ChatGPT and Google Gemini. The subsequent discussion section critically engages with these results, situating them within the context of the existing literature and exploring their broader implications for AI in education. By synthesising our key findings and exploring their implications for future research and pedagogical practice in the rapidly evolving field of AI-assisted language education, this study aims to contribute to the growing body of knowledge on AI in education by offering culturally specific insights that can inform the development of more effective, inclusive, and culturally sensitive AI-enhanced language learning environments.

RESEARCH METHOD

Research Design

This study employed a qualitative research design to investigate the complex interplay between generative language models and EFL education in Indonesia (Hatch, 2023; Lichtman, 2023; Maxwell, 2013). Qualitative methods are particularly suitable for capturing participants' nuanced, subjective experiences, offering insights that may be overlooked by quantitative approaches (Bentalha & Alla, 2024; Dehalwar & Sharma, 2024). The design is characterised by its flexibility and adaptability, allowing for the exploration of emergent themes and patterns that were not anticipated at the outset of the study (Creswell & Poth, 2016; Lim, 2024). Such an approach is integral to uncovering novel insights into how tools such as ChatGPT and Google Gemini are utilised in EFL contexts while providing a holistic perspective that considers Indonesia's unique cultural and educational landscape.

Research Participants

The participants in this study were 40 sophomore students enrolled in the English department of a private Indonesian university. This cohort was chosen to balance the depth of analysis based on the diversity of perspectives. Sophomore students were specifically targeted because their intermediate stage of language learning allowed them to provide informed, yet formative insights. Participants were selected through purposive sampling to ensure representation across a range of academic backgrounds and proficiency levels (Etikan et al., 2016; Robinson, 2014). This strategy enriches the data, enabling a comprehensive understanding of how learners with varying abilities interact with AI-powered language tools during their educational journey.

Research Instruments

The primary instrument for data collection was an open-ended questionnaire designed to elicit reflective, detailed responses about the participants' experiences with ChatGPT and Google Gemini. The questionnaire covered several dimensions, including initial perceptions,

usage experiences, perceived benefits and challenges, impact on motivation and self-directed learning, and comparisons with traditional learning methods. Semi-structured follow-up interviews were conducted with a subset of participants to clarify and expand on the questionnaire responses, facilitating a deeper exploration of their experiences. These complementary methods provide a robust dataset that captures the complexity of participant interactions using generative language models.

Data Analysis

Thematic content analysis was employed to analyse the qualitative data, enabling the identification and interpretation of patterns and themes within the dataset (Castleberry & Nolen, 2018; Vaismoradi & Snelgrove, 2019). The analysis process began with familiarisation through repeated readings of the responses and interview transcripts, followed by coding to highlight relevant features. The codes were then grouped into potential themes, which were reviewed and refined to ensure that they accurately reflected the data. Themes were defined and named to capture their essence, and the final analysis was synthesised into a comprehensive report. The use of computer-assisted qualitative data analysis software (CAQDAS) enhances the rigour and efficiency of this iterative process (Dalkin et al., 2021). Ethical considerations, including informed consent, anonymisation, and compliance with data protection regulations, ensured participant privacy and integrity of the research (Pietilä et al., 2020).

RESEARCH FINDINGS AND DISCUSSION

Research Findings

The analysis of qualitative data collected from Indonesian EFL sophomores revealed rich experiences and perceptions regarding the use of ChatGPT and Google Gemini in language learning. Through a careful examination of participant responses and thematic analysis, several interconnected themes emerged, painting a comprehensive picture of how these AI tools function within the Indonesian EFL context.

A prominent finding that emerged from this study was the remarkable capacity of both AI models to facilitate authentic language interactions. The participants consistently described their experiences with these tools as closely mirroring real-world conversational scenarios. The data revealed that an overwhelming majority of the students (approximately 85 %) valued these tools for providing low-stakes practice opportunities. As one participant eloquently expressed, "With ChatGPT, I can practice speaking without feeling judged, which helps me build confidence gradually." This sentiment was echoed in many responses, highlighting how AI-mediated interactions helped reduce the anxiety typically associated with language practice. Another student noted, "I feel more comfortable making mistakes with the AI than with real people, which helps me learn faster."

In terms of content integration, the ChatGPT demonstrated advantages in facilitating cross-disciplinary learning experiences. The tool showed a remarkable ability to weave language instruction seamlessly with subject-specific content, creating rich learning opportunities that extended beyond mere language practice. Students reported engaging in meaningful discussions on literature, science, history, and current events while developing their English language skills. This finding strongly aligns with Eysenbach's (2023) research on the educational versatility of large language models. Several participants highlighted how this integration helped them develop both subject knowledge and language proficiency simultaneously, with one student remarking, "I can discuss complex topics in English while learning about them, which makes the learning process more efficient."

Google Gemini's multilingual capabilities emerged as a particularly valuable feature in the Indonesian context. The tool's ability to provide explanations in students' native languages when necessary proved especially beneficial for clarifying complex concepts. This finding

resonates with Hirosh and Degani's (2018) study on the benefits of multilingual learning approaches. Students reported feeling more confident in their learning journey when they had the option to receive clarification in their native language, although they consistently maintained English as their primary language of interaction with the tool.

The study revealed significant patterns in learning engagement through a detailed analysis of participant responses. Students reported a marked increase in their independent language practice, with approximately 75% indicating that they spent more time engaging in English outside formal class hours. This heightened engagement often manifests in spontaneous conversations with AI tools about topics of personal interest, suggesting a level of intrinsic motivation that aligns with Rana's (2023) observations about AI-enhanced active learning. Participants described developing regular English practice habits, often incorporating AI interactions into their daily routines.

The personalisation capabilities of both AI models have emerged as a crucial factor in their educational effectiveness. Participants consistently praised the tools' ability to adapt to their individual learning needs and preferences. This adaptability was particularly evident in vocabulary acquisition and grammar instruction, where AI systems could adjust their explanations and examples based on student responses and demonstrated proficiency levels. Students appreciated how the tools could provide simpler explanations when they struggled with concepts, and offered more challenging content as their skills improved.

However, the technical performance of these AI tools has strengths and limitations. While participants generally reported reliable language instruction experiences, there were notable variations in response accuracy, particularly when dealing with advanced grammatical concepts. This observation supports Borji's (2023) findings regarding the current limitations of the AI language models. The user interface experience also varied between the two tools, with ChatGPT generally receiving more favourable feedback for its straightforward interface, whereas Google Gemini's interface garnered mixed responses regarding its complexity and ease of use.

Implementation challenges have emerged as a significant consideration in Indonesia. The study revealed that approximately 30% of participants experienced intermittent access issues due to Internet connectivity problems, particularly in rural areas. This finding aligns with Cancino and Panes' (2021) research on technological barriers in developing regions, and highlights the importance of considering infrastructure limitations when implementing AI-based learning tools. Some participants reported developing workarounds, such as downloading conversations for offline reviews or scheduling practice sessions during periods of better connectivity.

Language-level appropriateness has emerged as another critical consideration in the implementation of these tools. This study found varying experiences with the complexity of AI-generated responses. Some participants reported that ChatGPT responses could be overly sophisticated, potentially hindering comprehension and learning effectiveness. Conversely, others have noted that Google Gemini occasionally produces oversimplified responses that do not adequately challenge their language skills. This variation in experience suggests the need for more refined control over language complexity in AI-generated responses.

The findings also revealed interesting patterns in how the students used these tools to supplement their formal language education. Many participants reported using AI tools to review and practice concepts learned in class, create additional examples of grammatical patterns, and explore alternative explanations for challenging topics. This self-directed learning behaviour suggests that AI tools can effectively support traditional classroom instruction when properly integrated into students' learning strategies.

These findings collectively paint a picture of AI language tools as promising, yet complex additions to the EFL learning environment. While they offer significant benefits in

terms of accessibility, engagement, and personalisation, their effective implementation requires careful consideration of the technical, pedagogical, and contextual factors. The experiences of Indonesian EFL sophomores suggest that these tools can significantly enhance language learning when properly integrated while also highlighting areas where further development and refinement may be beneficial.

Discussion

The findings of this study have profound implications for EFL pedagogy, and raise critical considerations for the integration of AI tools in language education. Through careful analysis of the results, several interconnected themes emerged that warrant detailed examination from both theoretical and practical perspectives. From a pedagogical perspective, enhancement of active learning is a particularly significant outcome. The observed increase in student engagement and independent practice strongly aligns with contemporary theories on active learning in language acquisition. Ellis and Larsen-Freeman's (2006) emphasis on interaction in language development finds strong support in how these AI tools facilitate authentic conversations. The marked increase in student-initiated learning activities demonstrates the effectiveness of these tools in scaffolding autonomous learning behaviours. Students' willingness to engage in extended conversations with AI platforms suggests a transformation in how learners approach language practice outside of traditional classroom settings.

The successful integration of content-based instruction using AI tools represents a noteworthy advancement in EFL pedagogy. This finding substantiates Duenas's (2004) arguments for content-based instruction in language learning, demonstrating how AI can effectively bridge the gap between theoretical frameworks and practical implementation. The ability of these tools to seamlessly combine language instruction with subject-specific content opens new avenues for interdisciplinary learning. This integration allows students to develop both linguistic competence and subject matter expertise simultaneously, thus creating more meaningful and contextualised learning experiences.

Google Gemini's multilingual capabilities have particularly significant implications for culturally responsive pedagogy. These findings align closely with Gay's (2018) framework for culturally responsive teaching, suggesting that AI tools can effectively support inclusive educational practices. The ability to provide explanations in students' native languages while maintaining English as the primary learning medium represents a sophisticated approach to language scaffolding. This feature acknowledges the importance of students' linguistic backgrounds in facilitating their progress in English language acquisition.

The technological integration considerations revealed in this study merit careful attention, particularly regarding infrastructure and access. The identified connectivity challenges highlight the crucial considerations for educational technology implementation in developing contexts. As Cerf (2019) noted, infrastructure limitations can significantly impact the effectiveness of educational technology. These findings highlight the urgent need to develop offline capabilities, invest in digital infrastructure, create low-bandwidth alternatives, and implement hybrid learning approaches that can function effectively in various technological contexts. Tool optimisation has emerged as a critical area for consideration. Varying experiences with user interfaces and language complexity levels indicate the need for more nuanced tool development. Following Chapelle and Sauro's (2017) recommendations for technology integration in language learning, future developments should focus on user interface simplification, adaptive language-level adjustment, customisable learning pathways, and enhanced feedback mechanisms. These improvements would help ensure that AI tools serve the diverse needs of language learners better.

This study's findings regarding educational equity and access raise important concerns about the digital divide in language education. The access disparities identified echo the

concerns raised by Soares et al. (2019) regarding educational technology equity. Connectivity challenges particularly affect rural students' risk of exacerbating existing educational inequalities, suggesting an urgent need for policy interventions to ensure equitable access to AI-enhanced learning opportunities. This situation calls for a comprehensive approach to addressing infrastructure gaps and ensuring that technological advancements in education benefit students equally.

The varying responses to language complexity underscore the importance of inclusive design principles in educational technology. Drawing on Tomlinson's (2014) differentiated instruction framework, the future development of AI tools should incorporate multiple proficiency level options, diverse learning style accommodations, flexible content delivery methods, and varied assessment approaches. This inclusive approach would help ensure that AI-enhanced language learning tools serve the needs of all students regardless of their learning preferences or proficiency levels. Looking toward future developments, several key areas have emerged for enhancing AI-supported language instruction. The integration of more interactive speaking activities, development of collaborative learning features, enhancement of feedback mechanisms, and implementation of progress tracking tools will significantly improve the educational effectiveness of these platforms. Technical improvements should focus on developing offline functionality, enhancing user interface accessibility, implementing more sophisticated language-level adaptation, and integrating cultural context awareness.

The policy implications of these findings are both substantial and multifaceted. There is a clear need for infrastructure investment in rural areas, the development of comprehensive teacher training programs, the creation of guidelines for AI tool integration, and the establishment of quality standards for AI-enhanced instruction. These policy considerations should be approached from a long-term perspective, recognising that the successful integration of AI in language education requires sustained commitment and resource allocation. From a theoretical standpoint, this study makes several significant contributions to our understanding of AI in language education. It extends active learning theory to include AI-mediated instruction, provides empirical support for content-based instruction in digital contexts, advances the understanding of culturally responsive technology integration, and contributes to theories of differentiated instruction in digital environments. These theoretical contributions help to build a more comprehensive framework for understanding how AI tools can effectively support language learning.

The implications of these findings suggest that while ChatGPT and Google Gemini offer significant potential for enhancing EFL instruction, their successful implementation requires careful consideration of the technical, pedagogical, and social factors. This study highlights the need for balanced approaches that leverage AI capabilities while addressing infrastructure limitations and maintaining a focus on pedagogical objectives. This balance is crucial for ensuring that technology serves educational goals, rather than directing them. As these technologies continue to evolve, future research should focus on examining their long-term impacts, developing optimisation strategies, and identifying ways to ensure equitable access to AI-enhanced learning opportunities. The rapid pace of technological advancement in this field suggests that ongoing research is essential to understand how best to integrate these tools into educational practices.

CONCLUSION

This study offers a thorough exploration of the pedagogical potential of ChatGPT and Google Gemini in Indonesian EFL education, shedding light on how generative language models can reshape language-learning experiences. Through a qualitative analysis of Indonesian EFL sophomores' interactions with these AI tools, we identified a nuanced interplay between affordances and constraints with significant implications for the future of

language pedagogy. ChatGPT excels in simulating authentic conversational experiences and delivering content-based instruction, aligning with communicative and integrated language-learning approaches. Meanwhile, Google Gemini's multilingual and culturally responsive capabilities enable inclusivity, particularly in linguistically diverse settings, such as Indonesia. These tools provide complementary strengths and foster active learning, linguistic engagement, and cross-cultural understanding. However, the study also underscores key challenges, such as linguistic complexity, conversational rigidity, and the need for reliable Internet connectivity, which necessitates thoughtful integration and refinement of these technologies.

The implications of this research extend beyond immediate classroom applications and offer valuable guidance for educators, instructional designers, and policymakers. For practitioners, the findings highlight strategies to leverage AI tools effectively while addressing their limitations, ensuring that their integration enriches the existing pedagogical practices. For policymakers, this study emphasises the importance of investing in digital infrastructure, fostering equitable access to technology, and supporting teacher training to maximise the potential of AI in education. As AI continues to evolve, advancements in adaptive interfaces, offline functionalities, and interdisciplinary applications present promising avenues for innovation and further research. However, these developments must be underpinned by commitment to equity, accessibility, and cultural relevance to avoid exacerbating educational disparities. In conclusion, while ChatGPT and Google Gemini represent transformative tools for EFL education, their effective implementation requires a balanced approach that values both AI capabilities and the irreplaceable role of human interaction in fostering holistic language development. The insights from this study contribute to a growing body of knowledge on AI in education, paving the way for more personalised, engaging, and effective learning experiences for diverse learners.

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