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University Students' Perceptions of AI-Assisted Language Learning Scaffolding in Reducing L1 Reliance During Authentic English Speaking

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Abstract
Developing authentic English-speaking skills, defined here as the ability to communicate spontaneously and appropriately in real-world contexts, and reducing dependency on the first language (L1) are significant challenges for Indonesian EFL learners. This study investigates university students' perceptions of using AI tools like ChatGPT and Google Gemini as scaffolding to mitigate L1 reliance and foster such authentic speaking practice. A mixed-methods explanatory sequential design was employed, beginning with a descriptive survey of 50 Indonesian EFL students, followed by in-depth interviews with 6 participants. Quantitative findings revealed that students positively perceived AI-driven scaffolding, its role in reducing L1 dependency, and its contribution to enhancing authentic communicative competence. Qualitative analysis, framed by Sociocultural Theory, the Technology Acceptance Model (TAM), and Skill Acquisition Theory, uncovered three central themes: AI as a dynamic scaffold within the Zone of Proximal Development (ZPD), its effectiveness in driving learner autonomy, and its role in fostering communicative autonomy. The study concludes that AI-assisted scaffolding is perceived as an integrated technological support system that effectively addresses the cognitive, affective, and practical dimensions of L1 dependency, thereby promoting authentic English-speaking proficiency. These findings suggest practical implications for EFL pedagogy, advocating for the strategic integration of AI tools as complementary scaffolds in resource-constrained educational contexts to bridge the gap towards independent and authentic communication.

Keywords: AI-Assisted Scaffolding, Authentic English Speaking, EFL, L1 Dependency, Language Acquisition

Introduction

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In contemporary English as a Foreign Language (EFL) education, achieving advanced speaking proficiency is essential for global participation and professional success (Dennis, 2024; Wang et al., 2025; Wu et al., 2025). However, for Indonesian learners, developing the crucial skill of spontaneous, authentic communication remains a significant challenge (Wu, 2023). A primary obstacle is the persistent dependency on their first language (L1), Bahasa Indonesia. This L1 reliance operationally refers to the cognitive and productive habit of mental translation from Indonesian to English, along with lexical borrowing and syntactic transfer, which hinders fluency, disrupts speech flow, and creates profound linguistic insecurity during unscripted interactions (Roy & Paul, 2023; Tran & Yeh, 2020). This issue is compounded by systemic constraints within Indonesia's educational system, which often prioritizes exam-based learning over communicative competence, resulting in limited exposure to authentic English environments (Wu, 2023; Yu, 2022).

The emergence of Artificial Intelligence (AI) technologies is profoundly transforming language education, offering innovative tools and pedagogical approaches specifically targeted at enhancing speaking skills (Ericsson & Johansson, 2023; Raza et al., 2025). This shift moves from traditional methods towards a personalized, technology-enhanced speaking pedagogy, driven by AI's exponential advancement (Guo et al., 2024; J. G. Wu & Miller, 2025). Sophisticated conversational agents like ChatGPT and Google Gemini simulate real-life dialogue, provide adaptive, real-time feedback, and offer unlimited practice in spontaneous speaking, directly addressing challenges of limited practice opportunities (Isotalus et al., 2025; Kasneci et al., 2023; Roy & Paul, 2023).

Theoretically, these tools align with (Vygotsky, 1978) concept of scaffolding, operating within a learner's Zone of Proximal Development (ZPD) to provide support for tasks learners cannot accomplish independently (Poehner & Leontjev, 2023). Practically, they create a low-stakes, psychologically safe environment that reduces affective barriers and anxiety associated with speaking a foreign language, a key driver of L1 dependency (AlTwijri & Alghizzi, 2024; Crompton et al., 2024; Li et al., 2025; Zhou et al., 2024). Research indicates AI scaffolding can offer visual and verbal prompts, model correct usage, and engage learners in simulated dialogues, thereby providing the necessary support to reduce reliance on L1 for cognitive support and promote the internalization of target language structures (Kasneci et al., 2023; Poehner & Leontjev, 2023; Xie et al., 2019).

Despite global research highlighting AI's benefits for language learning (Karataş et al., 2024; Liu & Wang, 2024), its specific application to address the entrenched issue of L1 dependency and foster authentic speaking practice within the distinct Indonesian context is not well understood. Existing studies have explored AI for general language learning or isolated skills, but few have specifically investigated its role as a scaffold to minimize L1 reliance, particularly for *Bahasa Indonesia* speakers, in authentic speaking tasks (Luckin et al., 2022; Nursanti, 2021). Learners' lived experiences with AI for speaking practice in

teacher-centered, resource-constrained environments like Indonesia's require further empirical exploration (Van Dijk, 2025; Wei, 2024). This gap is significant because contextual factors such as pedagogical traditions and technological access fundamentally shape how AI tools are adopted and experienced (Wei, 2024).

The novelty of this research lies in its focused investigation of AI as a scaffold specifically targeting the reduction of Bahasa Indonesia L1 dependency, a context-specific, high-impact problem, within the framework of authentic communication. It moves beyond examining general AI utility to explore its role in facilitating a critical cognitive and linguistic transition for learners in a resource-constrained, exam-oriented educational setting.

To address this gap, the present study was conducted. Based on this gap analysis, this study aims to investigate the perceptions of Indonesian EFL university learners regarding the use of AI-based scaffolding, specifically through tools like ChatGPT and Google Gemini, to reduce L1 reliance and promote authentic English usage. Consequently, it is guided by the following research objectives:

1. To measure the extent to which Indonesian EFL university students perceive that AI-driven language learning scaffolding contributes to reduced L1 dependency during authentic English speaking practice.
2. To investigate how Indonesian EFL university students perceive AI-assisted language learning scaffolding as an integrated technological support system that provides dynamic sociocultural mediation, demonstrates technological acceptance, and facilitates skill acquisition.

Method

Research Design

This study employed a mixed-methods explanatory sequential design to comprehensively investigate university students' perceptions of AI-assisted scaffolding in reducing L1 dependency during authentic English speaking. The research commenced with a quantitative phase utilizing a descriptive survey to identify broad patterns and trends in student perceptions regarding the usefulness and impact of AI tools like ChatGPT and Google Gemini. This was followed by a qualitative phase involving semi-structured interviews to explore the reasons, contextual experiences, and nuanced perspectives behind the selected participants' survey responses in greater detail. This dual-phase approach was strategically chosen to obtain both generalizable statistical trends and rich, in-depth insights, enabling a thorough understanding of the phenomenon from multiple angles.

This approach is visually summarized in the figure below, which outlines the sequential flow of the explanatory sequential design, from quantitative data collection and analysis to qualitative data collection and analysis, culminating in an integrated interpretation of the results (Creswell & Clark, 2011).

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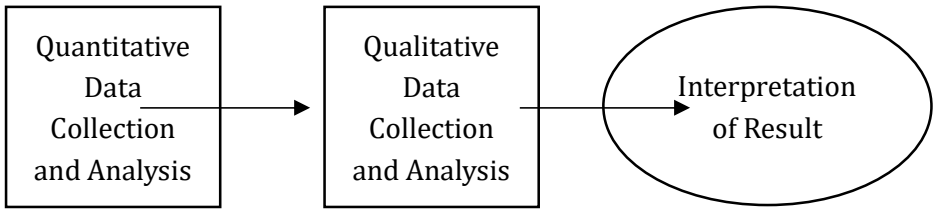

Figure 1. Explanatory Sequential Design (Creswell & Clark, 2011)

Research Location and Participants

This study employed a mixed-methods explanatory sequential design to comprehensively investigate university students' perceptions of AI-assisted scaffolding in reducing L1 dependency during authentic English speaking. The research was conducted at a higher education institution in Indonesia. The quantitative phase involved a descriptive survey administered to a purposive sample of 50 Indonesian EFL students enrolled in English language courses. Participants were selected based on four predetermined criteria: (1) intermediate level of English proficiency, (2) observed dependency on Bahasa Indonesia in English-speaking contexts, (3) prior experience using AI tools like ChatGPT or Gemini for language learning, and (4) current enrollment in speaking-focused courses. This sampling strategy ensured participants could provide meaningful insights based on relevant experience with the phenomenon. Following the quantitative phase, the qualitative phase involved in-depth interviews with a subset of 6 informants, who were purposefully selected from the initial survey participants to provide richer, more detailed explanations of the quantitative findings.

Research Instrument

The Perception Questionnaire

The instrument for this study is a structured, closed-ended questionnaire utilizing a five-point Likert scale. This instrument was selected for its efficiency in collecting quantifiable data on attitudes and perceptions from a larger sample, allowing for the identification of overarching trends and patterns (Creswell & Creswell, 2017). The questionnaire is systematically designed to operationalize the study's core variables by measuring students' perceptions across three key constructs: the utility of AI-driven scaffolding, its impact on L1 dependency, and its role in fostering authentic English communication. Questionnaire Structure and Rationale:

1. Part 1: Demographic Information

   This section collects foundational data to contextualize the participants' responses and enable basic descriptive analysis.
2. Part 2: Perception Statements (Likert Scale: 1 = Strongly Disagree to 5 = Strongly Agree)

   The Likert scale is ideal for capturing the intensity of participants'

agreement or disagreement with each statement, transforming subjective perceptions into quantifiable data. The statements are grouped into three theoretically grounded sections.

a. Section A: Perception of AI-Driven Scaffolding (6 questions): This section is designed to assess whether students perceive the AI tools as effective scaffolds, aligning with Vygotsky's concept of support within their ZPD.
b. Section B: Perception on Reducing L1 Dependency (6 questions): This section directly targets the study's primary objective, measuring perceived changes in the reliance on *Bahasa Indonesia* across cognitive and production domains.
c. Section C: Perception on Enhancing Authentic English Speaking (6 questions): This section evaluates the extent to which students perceive their interactions with AI as contributing to genuine, real-world communicative competence.

Semi-Structured Interview

The qualitative instrument employed a semi-structured interview protocol with informed consent and the following thematic sections:

1. Sociocultural Theory: AI as a Meditational Tool for Scaffolding in the ZPD (Vygotsky, 1978) (4 questions): exploring students' experiences with AI-mediated scaffolding in their zone of proximal development.
2. Technology Acceptance Model (TAM) (Davis, 1989): An Analytical Framework for Investigating Student Adoption of AI Tools in EFL Speaking Practice
   a. Perceived Usefulness (PU) (2 questions): examining the perceived effectiveness of AI tools in reducing L1 dependency and enhancing authentic speaking
   b. Perceived Ease of Use (PEOU) (2 questions): investigating usability aspects and technical accessibility of AI tools
   c. Attitudes Toward Using (ATU) (1 questions): the students' feelings or emotional attitudes toward the technology
   d. Behavioral Intentions (BI) (1 questions): exploring continued usage intentions and implementation preferences
3. Reducing L1 Dependency And Fostering Authentic Speaking Development (DeKeyser, 2020) Skill Acquisition Theory
   a. Cognitive Process Transformation (1 question): investigating changes in mental translation habits and direct thinking in English
   b. Authentic Communication Confidence (1 question): examining development of real-world speaking competence
   c. Concluding Question (1 question): Allowing participants to share any additional experiences, challenges, or benefits they consider important that were not covered in the previous questions, ensuring comprehensive data collection and participant validation of the research topic.

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Data Analysis

The data analysis process employed distinct yet complementary techniques for each research phase. Quantitative data obtained from the Likert scale were processed and analyzed using descriptive statistics, including frequency distributions, percentages, and variability. The mean and standard deviation were calculated for each statement to identify the central tendency of participants' perceptions and the distribution of their responses, respectively. To present these findings clearly, the results were organized into frequency distribution tables, complete with percentages. For the interpretation of the results, the mean score for each statement was evaluated against a standard scale: scores from 4.21 to 5.00 were interpreted as "Strongly Agree," 3.41 to 4.20 as "Agree," 2.61 to 3.40 as "Neutral," and 1.81 to 2.60 as "Disagree."

Qualitative data were analyzed using thematic analysis following the approach by (Braun & Clarke, 2006), which has proven effective in educational context research. The analysis process was conducted through six systematic stages: familiarization with data, generating initial codes, searching for themes, reviewing themes, defining themes, and producing the report. The application of thematic analysis in this study adhered to the trustworthiness criteria standards developed by (Nowell et al., 2017) to ensure the credibility of the findings. This analysis will provide a comprehensive overview of students' perceptions regarding the use of AI-assisted language learning scaffolding in reducing L1 dependency during authentic English speaking.

Findings

Quantitative Findings

This section presents the quantitative findings derived from the descriptive analysis of the survey data collected from 50 Indonesian EFL university students. The results are organized into four main tables covering demographic profiles and three key constructs of the study.

Demographic Profile of Respondents

To provide a clear overview of the research participants' characteristics, Table 1 presents the demographic profile of the 50 respondents involved in the study. The data encompasses the distribution of gender, age, university, faculty or major, years of learning English, as well as the frequency and most commonly used AI tools.

Table 1. Demographic Profile of Respondents (N=50)

Demographic Variable	Category	Frequency	Percentage
Gender	Female	32	64 %
	Male	18	36 %
Age	20-22 years	28	56 %

	23-25 years	18	36 %
	26-30 years	4	8 %
University	Institut Agama Islam Negeri Bone	26	52 %
	Universitas Negeri Makassar	21	42 %
	Universitas Islam Negeri Raden Intan Lampung	1	2 %
	Universitas Lampung	1	2 %
	Universitas Negeri Surabaya	1	2 %
Faculty/Major	English Education	43	86 %
	Constitutional Law	2	4 %
	Islamic Education	1	2 %
	Islamic Economics and Business	1	2 %
	Islamic Early Childhood Education	1	2 %
	Islamic Education Management	1	2 %
	Islamic Economic Law	1	2 %
Years of Learning English	1-5 years	27	54 %
	6-10 years	15	30 %
	>10 years	8	16 %
Frequency of AI Use	Daily	15	30 %
	3-5 times/week	16	32 %
	1-2 times/week	11	22 %
	Rarely	8	16 %
Most Used AI Tool	ChatGPT	28	56 %
	Google Gemini	7	14 %
	Others	15	30 %

Based on the data presented in Table 1, the demographic profile of the 50 respondents reveals several key characteristics that help contextualize the study's findings. The sample is heavily dominated by English Education students (86%). This strong homogeneity is a significant strength for studies focused specifically on AI use in English language learning. However, it may limit the generalizability of findings to students from other academic disciplines. The respondents are predominantly female (64%) and fall within the young adult age bracket (20-25 years, 92%). This is a common demographic profile in education-focused research, particularly in language teaching programs, and reflects the typical population in such departments. While the majority of students are from IAIN Bone (52%) and Universitas Negeri Makassar (42%), the presence of a few students from other universities adds a minor element of geographical diversity. However, the sample is primarily representative of universities in Eastern Indonesia. A majority of respondents (54%) have been learning English for 1-5 years,

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suggesting they are likely at an intermediate level. A substantial portion (46%) has 6 or more years of experience, indicating a mix of intermediate and advanced learners. A significant majority of respondents (84%) use AI tools at least once a week, with almost a third (32%) being very frequent users (3-5 times/week). This indicates that AI is already a integrated and regular part of the learning toolkit for these students. ChatGPT is the clear tool of choice (56%), establishing itself as the dominant platform in this educational context. "Other" tools collectively form a significant segment (30%), suggesting the use of a variety of alternative or niche AI applications, but without a single strong competitor to ChatGPT emerging from the data.

Perception of AI-Driven Scaffolding

Respondents' perceptions regarding the scaffolding functions of AI tools in English language learning are summarized in Table 2.

Table 2. Perception of AI-Driven Scaffolding

No	Statement	Mean	Std. Deviation	Interpretation	Level
1.	ChatGPT/Gemini provides me with immediate feedback during English speaking practice	4.04	0.92	Agree	High
2.	The AI suggests corrections that are easy for me to understand	4.20	0.84	Agree	Very High
3.	The language used by the AI matches my English proficiency level	4.00	0.87	Agree	High
4.	The AI helps me formulate more complex sentences in English	4.26	0.87	Strongly Agree	Very High
5.	The AI provides hints or clues that help me find the answer myself, rather than just giving it to me	3.92	1.01	Agree	High
6.	I feel the AI adapts its support based on my previous mistakes and responses	3.92	1.10	Agree	High
	Overall Average	4.06	0.94	Agree	High

The data presented indicates a strongly positive perception of AI-driven scaffolding among the respondents. This is evidenced by an overall average mean

of 4.06, which falls into the "Agree" category and "High" level. Analysis of the individual statements reveals that the AI's ability to help formulate more complex sentences (Statement 4, Mean=4.26) is the most highly valued aspect. The clarity of the AI's suggested corrections (Statement 2, Mean=4.20) also reaches the "Very High" level. Other functions, including providing immediate feedback, using level-appropriate language, offering hints, and adapting support (Statements 1, 3, 5, and 6), are all perceived positively, with means placing them in the "Agree" category and "High" level. Notably, the perception of the AI's ability to provide hints and adapt to user errors, while still positive, shows greater variability, as indicated by the higher standard deviations for these items.

Perception on Reducing L1 Dependency

Respondents' perceptions regarding the role of AI tools in reducing their dependency on L1, Bahasa Indonesia, are summarized in Table 3.

Table 3. Perception on Reducing L1 Dependency

No	Statement	Mean	Std. Deviation	Interpretation	Level
7.	Using the AI tool helps me think directly in English without translating from Bahasa Indonesia first	3.84	1.07	Agree	High
8.	I find myself using fewer Indonesian words when I practice speaking with AI	3.76	1.13	Agree	High
9.	The AI interactions reduce my habit of constructing English sentences using Indonesian grammar rules	3.72	1.15	Agree	High
10.	I feel less mentally dependent on Bahasa Indonesia when forming ideas in English with AI assistance	3.78	1.14	Agree	High
11.	When I am stuck for a word, the AI helps me find the English equivalent without me having to think of the Indonesian word first	4.08	1.03	Agree	High
12.	Practicing with the AI makes me more aware of the differences between English and Indonesian sentence	4.06	1.02	Agree	High

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	structure				
	Overall Average	3.87	1.09	Agree	High

The data reveals that respondents generally agree that AI tools help reduce their dependency on *Bahasa Indonesia* (L1), with an overall average mean of 3.87 falling in the "Agree" category and "High" level. The most strongly perceived benefit is the AI's assistance in finding English equivalents without needing to think of the Indonesian word first (Statement 11, Mean=4.08), followed closely by increased awareness of structural differences between English and Indonesian (Statement 12, Mean=4.06). While all statements received scores in the "High" level, the slightly lower means for Statements 7 through 10 (ranging from 3.72 to 3.84) suggest that reducing L1 interference in grammar and direct thinking patterns may be more challenging than vocabulary-related assistance. The consistently high standard deviations (all above 1.0) indicate substantial variation in these experiences among respondents.

Perception on Enhancing Authentic English Speaking

Table 4 presents respondents' perceptions regarding the role of AI tools in developing their communicative competence. The data measures their level of agreement with statements on conversational realism, fluency, confidence, and the ability to use English for genuine, spontaneous interaction.

Table 4. Perception on Enhancing Authentic English Speaking

No	Statement	Mean	Std. Deviation	Interpretation	Level
13.	Interacting with the AI tool feels like a realistic conversation	3.88	1.09	Agree	High
14.	I am more confident using informal expressions and idioms after practicing with the AI	3.92	1.06	Agree	High
15.	The AI helps me speak more fluently and with fewer pauses	3.84	1.09	Agree	High
16.	I can use English for genuine purposes more effectively after using the AI tools	3.96	1.04	Agree	High
17.	The AI helps me practice how to react and respond spontaneously in a conversation	4.00	1.04	Agree	High
18.	I feel better prepared to	3.96	1.04	Agree	High

handle unexpected questions or topics in English after practicing with the AI				
Overall Average	3.93	1.06	Agree	High

The data indicates a consistent positive perception regarding the development of communicative competence through AI tools, with an overall average mean of 3.93 falling within the "Agree" category and "High" level. The highest-rated aspect is the AI's role in practicing spontaneous responses in conversation (Statement 17, Mean=4.00), closely followed by improved effectiveness in using English for genuine purposes and handling unexpected topics (Statements 16 and 18, Mean=3.96). While all areas received high ratings, the slightly lower scores for conversational realism (Statement 13, Mean=3.88) and fluency improvement (Statement 15, Mean=3.84) suggest these might be more challenging areas to develop through AI interaction. The consistently high standard deviations across all statements indicate substantial variation in individual experiences with these communicative aspects.

Qualitative Findings

This section presents a thematic analysis of the qualitative data gathered from participant interviews. The findings are organized into three principal thematic categories, as illustrated in Figure 1. The first theme explores students' perceptions of AI as a dynamic scaffold operating within their ZPD. The second theme examines the role of AI in driving learner autonomy and reducing L1 dependency, analysed through the lens of the Technology Acceptance Model (TAM). The final theme details the resultant outcome of this process: the fostering of communicative autonomy, equipping students with the confidence and skills for authentic English interaction. The ensuring discussion is substantiated by direct evidence from participant accounts, which are systematically detailed in the accompanying tables.

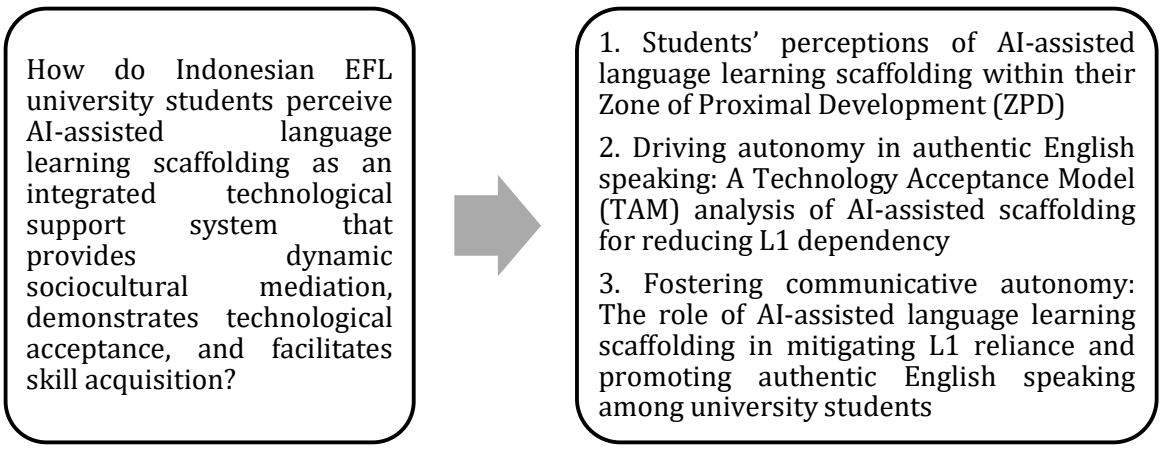

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Figure 2. Thematic Categories of the Findings

Students' perceptions of AI-assisted language learning scaffolding within their Zone of Proximal Development (ZPD)

The integration of AI tools in language learning is perceived by students as a dynamic scaffolding mechanism that operates effectively within their ZPD. Informant accounts reveal that AI support is not static but adaptively responsive to their evolving needs. This scaffolding progresses from providing foundational linguistic support to facilitating more complex, nuanced communication, effectively acting as a transitional aid that bridges the gap between dependent and independent language use. The following table (Table 5) outlines the key codes that constitute this theme.

Table 5. Students' perceptions of AI-assisted language learning scaffolding within their Zone of Proximal Development (ZPD)

No	Codes	Evidence Quotes
1.	Contextualized Cultural Scaffolding	Extract 1 "Based on my experience, I have often had difficulty explaining concepts from my culture, which is Bugis Bone. For example, I wanted to explain the mepetuada tradition... The AI helped me articulate these complex ideas in a way that sounds natural to native speakers." (Interview: AS, 2025) Extract 16 "In using ChatGPT and Gemini prompts, I usually use them to refine the structure of sentences in my writing files. I also use ChatGPT prompts to identify the main ideas of a script for activities that focus on speaking or listening." (Interview: ME, 2025)
2	Adaptive Feedback Complexity	Extract 2 "Adjustments usually occur through repeated interactions and prompting… the AI automatically increases the complexity of its language." (Interview: AS, 2025) Extract 17 "As my speaking skills improved, ChatGPT's support felt faster and more responsive. In addition, I could prompt GPT with various types of questions to help me assess how far my speaking ability had developed over time." (Interview: ME, 2025) Extract 18 "As my learning process progressed, the AI's support also changed from merely providing translations or basic

		corrections to offering in-depth explanations, variations of expressions, idioms, and situational usage examples. The AI began challenging me with follow-up questions or correcting minor mistakes that were previously not addressed." (Interview: NA, 2025) Extract 28 "Of course, the feedback I received from the AI was adjusted to my level of English proficiency. This was usually shown by how ChatGPT or Gemini provided explanations in a simple and generative way, making them easy for me to understand based on my language ability." (Interview: RA) Extract 29 "I can adjust the AI's feedback based on the language style or level of complexity I want. If I find the AI's responses difficult to understand, I ask for a simpler version." (Interview: AG)
3	Shift from Correction to Nuance	Extract 4 "As my skills improved, the AI was no longer needed to correct every verb or preposition. Its support evolved more subtly, focusing on nuance, clarity, and fluency rather than accuracy." (Interview: AS, 2025) Extract 19 "Practicing with the prompts helped me improve myself, but not everything in the prompts is something we will face in real-life situations. I usually provide alternative answers and adjust the prompts accordingly." (Interview: ME, 2025) Extract 30 "Usually, it gives input or proper guidance on how to speak in English. For example, it provides feedback on the correct and incorrect word choices in my English." (Interview: RA) Extract 31 "AI can provide feedback on my speaking presentations as well as on speaking practice drills, which I can adjust based on my speaking material needs. Over time, I find that both methods are effective in improving my speaking skills." (Interview: AG)

Students' experiences reveal that AI scaffolding dynamically adapts to their evolving language proficiency, aligning closely with the concept of the ZPD. This is evident as learners report that AI support shifts from providing basic corrections to offering nuanced, context-rich feedback as their skills improve. For instance, one

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student noted that AI transitioned from correcting grammar to focusing on nuances, fluency, and authenticity (Extract 4: AS), while another highlighted how AI's assistance progressed from simple translations to in-depth explanations and situational examples (Extract 18: NA). This progression indicates that AI functions not as a static tool, but as a responsive partner that grows with the learner. Such adaptability allows learners to be challenged appropriately, preventing stagnation and fostering continuous growth. Moreover, students actively shape this process by refining their prompts to elicit more suitable responses, as seen when one informant customized prompts to better match real-world applicability (Extract 19: ME). This active negotiation between learner and AI underscores a co-constructive process within the ZPD, where scaffolding is not merely received but collaboratively calibrated.

Driving autonomy in authentic English speaking: A Technology Acceptance Model (TAM) analysis of AI-assisted scaffolding for reducing L1 dependency

From the perspective of the Technology Acceptance Model (TAM), AI tools are perceived as both useful and easy to use, primarily because they directly foster learner autonomy and reduce dependency on the L1. The perceived usefulness stems from the AI's ability to rewire cognitive habits and build practical speaking skills, while the ease of use is amplified by the creation of a psychologically safe practice environment. This combination effectively empowers students to take control of their speaking development. The following table (Table 6) details the codes derived from this analysis.

Table 6. Technology Acceptance Model (TAM) analysis of AI-assisted scaffolding for reducing L1 dependency

No	Codes	Evidence Quotes
1.	Reduction of Mental Translation	Extract 5 "By using AI like ChatGPT or Gemini, I started learning to think in English… no longer focusing on word-by-word translation, but on the core message and the quick structure of the English language." (Interview: AS, 2025) Extract 6 "The use of Chat GPT and Gemini influenced my translation habits… it actually trained me to express my ideas more clearly in English." (Interview: DE, 2025) Extract 20 "I used to translate from Indonesian first before switching to English. After learning, I rarely translate Indonesian into English anymore." (Interview: NA, 2025)

		Extract 32 "In my opinion, it does not significantly affect my translation habits because the AI usually adjusts its responses to my level of proficiency and language understanding. So mentally, I am not greatly affected." (Interview: RA) Extract 33 "Interactions with the AI sometimes make me use a mix of English and Indonesian because it is also related to my major, English Education, as the types of assignments I work on require answers in English." (Interview: AG)
2	Development of Linguistic "Muscle Memory"	Extract 7 "AI practice increases spontaneity by building linguistic muscle memory. Through repeated conversations and role-playing exercises, I become faster at accessing the right vocabulary and sentence patterns." (Interview: AS, 2025) Extract 8 "When I repeat the same questions or exercises, I start to respond more spontaneously, even though it is not yet perfect." (Interview: DE, 2025) Extract 22 "Practicing with AI forces me to respond quickly without spending too much time constructing sentences. The AI often gives follow-up questions, making the practice feel like a real conversation. Over time, this builds my English reflexes." (Interview: NA, 2025) Extract 35 "When I do interview simulations or start conversations on a certain theme or topic, the AI sometimes asks questions beyond my expectations, which stimulates me to speak spontaneously." (Interview: AG)
3	Safe Space for Error Normalization	Extract 9 "Another benefit I haven't mentioned is how AI normalizes mistakes… creating the perception that 'it's okay to make mistakes here,' which dramatically reduces my mental filter." (Interview: AS, 2025) Extract 23 "Perhaps now I rarely use those prompts and have shifted

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	more to social media like TikTok, Instagram, and YouTube, focusing on speaking practice within those apps." (Interview: ME, 2025)

The integration of AI tools like ChatGPT significantly fosters linguistic autonomy among English learners by reducing their reliance on mental translation from their L1. This shift is largely attributed to the AI's capacity to engage users in continuous, meaningful interaction, which encourages them to conceptualize and structure messages directly in English rather than translating word-for-word from Indonesian. For instance, several informants reported that using AI helped them move beyond lexical-level processing to focus on message clarity and grammatical structure (Extract 5: AS; Extract 6: DE). Another informant noted a transition from consciously converting Indonesian into English to producing English more directly (Extract 20: NA). However, not all participants experienced this change uniformly; one informant perceived minimal impact on their translation habits, attributing this to the AI's adaptability to their current proficiency level (Extract 32: RA). Another highlighted the hybrid use of English and Indonesian, influenced by their academic context in English Education, suggesting that task demands can mediate the effect of AI on L1 dependency (Extract 33: AG). This variation indicates that while AI scaffolding generally promotes direct English formulation, individual differences in proficiency, academic background, and interaction purposes shape the extent of its influence. Each interpretive claim is supported by specific extracts (AS, DE, NA, AG) as indicated.

Fostering communicative autonomy: The role of AI-assisted language learning scaffolding in mitigating L1 reliance and promoting authentic English speaking among university students

The outcome of AI-assisted scaffolding is the fostering of communicative autonomy, equipping students with the confidence and skills to engage in authentic English interactions without the crutch of their L1. This is achieved through targeted practice scenarios that mimic real-world demands and a fundamental shift in the cognitive processes involved in speech production. By simulating diverse communicative contexts, the AI prepares learners for the unpredictable nature of genuine conversation, thereby mitigating anxiety and promoting self-reliance. The following table (Table 7) presents the codes that underpin this theme.

Table 7. The role of AI-assisted language learning scaffolding in mitigating L1 reliance and promoting authentic English speaking among university students

No	Codes	Evidence Quotes
1.	AI as a Simulated Dialogue Partner	Extract 10 "With AI, ChatGPT or Gemini can simulate interviews. I ask the AI to act as an interviewer from a specific company…" (Interview: AS, 2025)

		Extract 11 "ChatGPT and Gemini help me by providing challenging questions… so I can realize which parts I have mastered and which still need improvement." (Interview: DE, 2025) Extract 24 "AI helps me with tasks like conversation simulations, interview practice, formal dialogues, and spontaneous presentations that are difficult to do alone." (Interview: NA, 2025) Extract 25 "I ask the AI to train me with random scenarios, spontaneous questions, and realistic dialogues. This helps me get used to different types of conversations and makes me more prepared, like asking for directions." (Interview: NA, 2025) Extract 36 "Usually, I use this AI along with command sentences to create a situation as if I will be asked questions in the real world, with both random and predictable questions, so I can anticipate what is usually asked." (Interview: RA) Extract 37 "The AI can provide recommendations in conversations on certain topics by giving examples of words I can use." (Interview: AG)
2	Cognitive Shift from Translation to Ideation	Extract 12 "The change is like a shift in language… previously I was stuck in Indonesian structures. Now I have the idea… transforming my thinking from a translator to someone reorganizing ideas within the framework of the target language." (Interview: AS, 2025) Extract 13 "With the help of AI, it is easier for me to remember the correct sentence or phrase structures… it helps me learn proper sentence patterns." (Interview: DE, 2025) "After frequently using AI, my thinking process changed: I started thinking about sentence structures and vocabulary in English directly, and I can understand the meaning of a word

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		even if there is vocabulary I do not know in a sentence." (Interview: NA, 2025) *Extract 38* "By creating a prompt or command sentence with a clear workflow, I can produce well-structured and correct English sentences." (Interview: RA) *Extract 39* "The AI naturally provides answers based on the prompts I give. Often, the AI's responses do not match my intention, which makes me realize that my prompt was illogical or inaccurate, resulting in different outputs. In this way, I practice organizing my thoughts logically so that the AI provides answers that align with my intended meaning." (Interview: AG)
3	Mitigation of Anxiety through Diverse Simulation	Extract 14 "The AI prepares me through various simulations… By practicing with random and unstructured topics, I have become accustomed to the linguistic lexicality being trained." (Interview: AS, 2025) Extract 15 "Practice with GPT gives me room to improvise… This trains me to think more flexibly in real conversations." (Interview: DE, 2025) "I feel more confident because the AI is very supportive. I started learning many natural phrases rarely found in books, and I hope the AI will have an automatic voice feature to make it feel more real." (Interview: NA, 2025) Extract 40 "Usually, I use this AI along with command sentences to create a situation as if I will be asked questions in the real world, with random questions… so I can anticipate what is usually asked." (Interview: RA) Extract 41 When I do interview simulations… the AI sometimes asks questions beyond my expectations… which stimulates me to speak spontaneously." (Interview: AG)

AI-assisted language learning fosters communicative autonomy by

functioning as a dynamic scaffolding tool, which not only provides practical speaking practice but also fundamentally reshapes cognitive and affective processes in second language acquisition. This is evident in three key areas: its role as a simulated dialogue partner, its facilitation of a cognitive shift from translation to direct ideation in English, and its capacity to mitigate speaking anxiety. Firstly, learners utilize AI to engage in realistic, low-stakes interactions, such as mock interviews and spontaneous conversations, which would be difficult to self-practice. As one informant notes, this allows them to become accustomed to various conversation types and feel more prepared for real-world interactions (Extract 25: NA).

This practice moves learning beyond rote memorization towards adaptive language use. Secondly, the scaffolding promotes a crucial cognitive shift. Learners report a transition from being trapped in their first language structure (Extract 12: AS) towards internalizing correct sentence patterns and formulating ideas directly within the target language framework (Extract 13: DE). This indicates a move away from reliance on L1 translation, a key step towards authentic and fluid speech. Furthermore, the process of crafting effective prompts itself becomes a metacognitive exercise in logical thinking and precise expression (Extract 39: AG). Finally, these diverse and repeated simulations directly contribute to reducing anxiety and building confidence.

By practicing with random topics and unexpected questions, students become familiar with linguistic demands and learn to improvise, which trains them to be more flexible in real conversations (Extract 15: DE). The supportive and non-judgmental nature of the AI environment further encourages risk-taking, with one informant explicitly stating they felt more confident as a result (Interview: NA, 2025). Collectively, these facets demonstrate that AI scaffolding does not merely provide answers but cultivates the independent skills, cognitive frameworks, and psychological readiness necessary for genuine communicative autonomy in English.

Discussion

The Perceived Extent of AI-Driven Scaffolding in Reducing L1 Dependency

The quantitative findings demonstrate that Indonesian EFL university students perceive AI-driven language learning scaffolding as making a substantial contribution to reducing their L1 dependency during authentic English speaking practice. The overall high level of agreement (Mean = 3.87) across all indicators in Table 3 provides compelling evidence that AI tools like ChatGPT and Google Gemini are effectively addressing the fundamental challenge of L1 reliance identified by Jarvis and Pavlenko (2008) and Odlin (2003). This finding gains greater significance when viewed against Indonesia's complex linguistic landscape, where studies of natural speech processing have shown that both L1 and L2 users demonstrate similar segmentation abilities when processing continuous speech (Blum et al., 2024; Dobrego et al., 2023; Saito et al., 2022), suggesting that the challenge for Indonesian learners lies not in comprehension but in production,

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precisely where AI scaffolding proves most valuable (Crompton et al., 2024; Kheryadi & Hilmiyati, 2021; Yang & Kyun, 2022).

Viewed through the lens of Vygotsky (1978) Sociocultural Theory, the AI functions as a dynamic scaffold operating within learners' Zone of Proximal Development (ZPD), providing the "personalized, adaptive support" that Zhai & Wibowo (2022) and Kasneci et al. (2023) identified as revolutionary in AI language learning. The highest-rated aspect - the AI's assistance in finding English equivalents without first thinking of the Indonesian word (Statement 11, Mean=4.08) - demonstrates how AI provides immediate mediation that helps learners accomplish tasks they could not do independently (Crompton et al., 2024; Poehner & Leontjev, 2023; Vall & Araya, 2023). This directly addresses the "habitual process of mental translation from Indonesian into English" that Odlin (2003) and Mukti and Fauzi (2025) identified as disrupting fluency. Furthermore, the strong agreement with Statement 12 (Mean=4.06) regarding increased awareness of structural differences between English and Indonesian shows the AI's role in developing the metalinguistic awareness necessary to overcome "syntactic transfer" where "Indonesian sentence structure" is applied to "English phrases" (Adiantika, 2020; Jap et al., 2025; Odlin, 2003). This technological mediation aligns with emerging translanguaging pedagogy in Indonesia, where strategic use of multiple languages serves as scaffolding rather than interference (Nursanti, 2021; Permana & Rohmah, 2024; Setyaningrum et al., 2022).

From the perspective of the Technology Acceptance Model (TAM), the high perceived usefulness of AI tools stems from their direct addressing of core barriers to authentic English communication. The significant reduction in mental translation dependency (Statements 7 and 10) demonstrates how AI tools provide the "necessary support for learners to operate within their English speaking capabilities" (Kasneci et al., 2023; Xie et al., 2019), thereby reducing the "anxiety" that Syafiq et al. (2021) and Wu (2023) identified as a key cause of L1 dependency. This anxiety reduction through technology-enhanced learning is well-documented in CALL research, particularly in addressing public speaking anxiety among EFL learners (AlTwijri & Alghizzi, 2024; Chen, 2024; Guo et al., 2024; Xie et al., 2019). The high frequency of AI usage (84% use AI at least weekly) among respondents correlates with these positive perceptions, indicating strong behavioral intention driven by the technology's perceived utility in overcoming the "limited L2 proficiency and insufficient exposure to authentic English" that characterize Indonesian EFL contexts (Wu, 2023; Yu, 2022). This technological solution becomes particularly relevant in Indonesia's educational context, where traditional approaches have struggled to balance global English proficiency with local linguistic identities (Kusumaningputri, 2024; Nursanti, 2021; Permana & Rohmah, 2024; Syafiq et al., 2021), and where students often face societal stigma that limits their identity options as English users (Kusumaningputri, 2024).

Through the framework of Skill Acquisition Theory (DeKeyser, 2020), the quantitative results reveal AI's role in facilitating the transition from declarative to

procedural knowledge. The consistent high ratings across all six statements in Table 3 indicate that AI scaffolding provides the repetitive, targeted practice necessary to restructure learners' interlanguage systems. While vocabulary-related assistance (Statement 11) received the highest score, the slightly lower but still positive ratings for reducing syntactic transfer (Statement 9, Mean=3.72) and fostering direct thinking (Statement 7, Mean=3.84) reflect the graduated complexity of skill acquisition - proceduralizing grammar requires more extensive practice than lexical access. This pattern validates how AI delivers "contingent and fading support" that "helps learners internalize target language structures" and promotes "conceptual fluency" (Çobanoğullari & Özbek, 2025; Li et al., 2025; Luckin et al., 2022; Poehner & Leontjev, 2023), ultimately working to minimize the L1 reliance that "hinders the development of spontaneous and authentic English communication." The success of this AI-mediated skill development is particularly noteworthy given research showing that L1 and L2 speakers demonstrate comparable proficiency in processing natural continuous speech (Crompton et al., 2024; Dobrego et al., 2023; Liang et al., 2023), suggesting that with proper scaffolding, Indonesian EFL learners can achieve production abilities matching their comprehension skills. Moreover, AI tools provide a safe digital space for identity negotiation and anxiety-free practice, allowing learners to experiment with English without facing the societal stigma that often limits their identity options in offline settings (Kusumaningputri, 2024), while also addressing the public speaking anxiety that commonly affects EFL learners through personalized, technology-enhanced feedback (Chen, 2024).

The Integrated Perceptions of AI as a Dynamic Sociocultural, Technological, and Skill-Acquisition Tool

The qualitative findings provide rich, nuanced insights into how students perceive AI-assisted scaffolding as an integrated technological support system that simultaneously provides dynamic sociocultural mediation, demonstrates technological acceptance, and facilitates skill acquisition.

Students consistently described AI as providing dynamic sociocultural mediation that operates within their ZPD. The adaptive nature of AI scaffolding emerged as a central theme, with learners reporting that support evolved from basic corrections to nuanced feedback as their proficiency improved (Extract 4: AS; Extract 18: NA). This demonstrates the "temporary support tailored to a learner's ZPD that is gradually withdrawn as competence increases" (Vygotsky, 1978; Wood et al., 1976) that characterizes effective scaffolding. This finding resonates with the discrete effects of AI-based interactive scaffolding on speaking performance and self-evaluation reported in informal digital learning environments (Crompton et al., 2024; C. Li & Zhang, 2023; Wang et al., 2025), highlighting the role of human-AI interaction in providing graduated assistance. Furthermore, students valued the AI's ability to provide "contextualized cultural scaffolding" (Extract 1: AS), helping them express complex cultural concepts in ways that "sound natural to native

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speakers." This extends AI's role beyond grammatical accuracy into the sociolinguistic and pragmatic dimensions of "authentic communication" that (Gilmore, 2007) characterized as involving "contextual appropriateness," addressing a crucial gap in environments with "limited real-world interaction" (Huang et al., 2022; Willis & Willis, 2013).

The TAM framework illuminates why students so readily integrate AI into their learning practices. The perceived usefulness stems primarily from the AI's effectiveness in "reducing the need to fall back on L1 for cognitive support" (Kasneci et al., 2023; Xie et al., 2019). Multiple informants described a dramatic "Reduction of Mental Translation" (Extract 5: AS; Extract 6: DE; Extract 20: NA), indicating that AI tools successfully address the "habitual process of mental translation" that (Odlin, 2003) identified as central to L1 dependency. This perception of usefulness is a critical component of technology acceptance models applied to AI in EFL, as confirmed by research on integrated models of technology acceptance for AI speech evaluation tools (An et al., 2023; Zhou et al., 2024). The perceived ease of use was significantly enhanced by the "Safe Space for Error Normalization" (Extract 9: AS), where the non-judgmental AI environment reduces the "anxiety" that (Syafiq et al., 2021) and (Wu, 2023) identified as reinforcing L1 dependency. This combination of high perceived usefulness and ease of use creates strong behavioral intentions to continue using AI, confirming its value as a technological solution to the persistent challenge of L1 reliance in Indonesian EFL contexts.

Most significantly, students perceive AI as effectively facilitating skill acquisition and fostering communicative autonomy. The development of "Linguistic Muscle Memory" (Extract 7: AS; Extract 8: DE; Extract 22: NA) through repeated AI interactions demonstrates how "AI scaffolding can address L1 dependency by providing the necessary support for learners to operate within their English speaking capabilities" (Kasneci et al., 2023; Y. Li et al., 2025; Ma & Chen, 2025; Xie et al., 2019). This practice leads to the fundamental "Cognitive Shift from Translation to Ideation" (Extract 12: AS; Extract 13: DE), representing a crucial milestone in the transition from controlled to automatic processing that (DeKeyser, 2020) emphasized in Skill Acquisition Theory. This process is supported by the broader landscape of language policy in Indonesia, where contemporary translingual practices are increasingly recognized as valuable pedagogical scaffolds rather than impediments to English acquisition (Cenoz & Gorter, 2020; Permana & Rohmah, 2024; Zein et al., 2020), suggesting that AI tools can complement and enhance these evolving pedagogical approaches. By engaging in simulated dialogues that mimic "realistic practice scenarios" (Huang et al., 2022; Willis & Willis, 2013), students develop the ability to handle "unexpected questions or topics" (Extract 14: AS; Extract 15: DE), directly building toward the "spontaneity" and "functionality" that (Gilmore, 2007) identified as essential to authentic communication. This integrated support system ultimately "Mitigates Anxiety" and builds the confidence necessary for genuine communicative autonomy,

demonstrating AI's comprehensive effectiveness in addressing the cognitive, affective, and practical dimensions of overcoming L1 dependency and achieving authentic English speaking competence.

Conclusion

This study concludes that Indonesian EFL university students perceive AI-assisted language learning tools, such as ChatGPT and Google Gemini, as an effective, integrated scaffolding system that addresses the multifaceted challenge of L1 dependency in authentic English speaking. The findings reveal that AI is not viewed merely as a technological aid but as a dynamic sociocultural mediator, a readily accepted pedagogical tool, and a facilitator of critical skill acquisition. It operates within learners' Zone of Proximal Development by providing adaptive, culturally contextualized support that evolves with their proficiency. Through this interaction, AI fosters learner autonomy by creating a low-stakes environment that normalizes errors, reduces speaking anxiety, and crucially, promotes a cognitive shift away from mental translation toward direct ideation in English. However, several limitations warrant caution in generalizing these findings. First, the study's participant profile was relatively homogenous, predominantly consisting of English Education majors from specific universities in Eastern Indonesia, which may not represent the experiences of students from other disciplines or geographical regions. Second, the research relied on self-reported perceptions and experiences, which, while rich, are subjective and may not directly correlate with measurable improvements in objective speaking performance. Finally, the study focused on a specific set of generative AI tools during a particular period of rapid technological evolution; the perceived efficacy and specific applications of such tools are likely to continue changing.

Based on the conclusions and limitations, several avenues for further research are recommended. Future studies should employ longitudinal or experimental designs to objectively measure the causal impact of AI scaffolding on actual speaking skills and the reduction of L1 interference, moving beyond perceptual data. Research should also expand to include more diverse participant pools, encompassing students from non-language majors and various socio-economic and educational backgrounds across Indonesia, to enhance the generalizability of findings. Furthermore, as AI technology evolves, investigations into the pedagogical integration of newer features and their specific effects on different aspects of communicative competence are needed. Finally, qualitative research exploring instructor perspectives and the development of best-practice frameworks for integrating AI scaffolding into formal EFL curricula in resource-constrained contexts would be valuable to bridge the gap between autonomous student use and structured classroom application.

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