

# Integrating Artificial Intelligence in English Speaking Practice: Perceptions, Challenges, and Effectiveness in Vocational Higher Education

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| ARTICLE INFO                                                                                                     | ABSTRACT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| <b>Article history</b><br>Received Jan 27, 2026<br>Revised May 08, 2026<br>Accepted June 15, 2026                | <p>The progress of computers that can think like humans has opened new chances for learning languages, especially for speaking, which has always been one of the hardest things for students to master. This research aims to examine what teachers and students think about using computer programs powered by AI, such as ChatGPT, Duolingo, Elsa Speak, and Google Gemini, to help them improve their speaking. The way it was done was by using a mix of methods that started with numbers and then moved to words. The part with numbers had surveys for students and teachers, and then the part with words looked closer at what the surveys showed. The data showed that most people thought AI was very useful for practicing speaking, mainly for learning how to say words, how smoothly they spoke, and which words they used, and for giving quick answers that made learning faster. AI is also seen as adaptable because it lets people practice on their own, whenever and wherever they want, and it can get students excited with fun activities and games. But the biggest problems found were not having enough good technology, some switch students not being ready to use technology well, and AI not being able to teach as well as people because it does not understand the situation and cannot fully replace talking to a real person. In conclusion, the research shows that AI could significantly improve the effectiveness of learning to speak. But this can only happen if AI is used alongside teachers who are involved and with the right technology to support it. The research stresses that AI should be seen as a resource that enhances language learning, not as a replacement for teachers. This highlights how important it is to come up with better ways to include AI that fit the situation, are fun, and can keep going in colleges, which should be what future research and putting into practice focus on.</p> <p>This is an open access article under the <a href="#">CC-BY</a> license.</p> |
| <b>Keywords</b><br>Artificial Intelligence<br>Chatbot<br>English learning<br>Higher Education<br>Speaking Skills |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |



## I. Introduction

Artificial Intelligence (AI) has increasingly transformed educational practices by enabling more adaptive, personalized, and data-driven learning environments. In language learning, AI technologies have been widely recognized for their ability to support individualized instruction, automate feedback, and facilitate continuous language practice beyond classroom boundaries. AI-powered tools such as intelligent tutoring systems, speech recognition applications, automated assessment platforms, and conversational agents have demonstrated positive impacts on learners' engagement, autonomy, and language performance (Maulana & Suharto, 2024; Zou et al., 2023). In English language education specifically, AI applications improve pronunciation, fluency, and speaking confidence and provide immediate corrective feedback, creating more

interactive and learner-centered experiences (Aryanti & Santosa, 2024; Tai & Chen, 2024). The integration of AI into language learning, therefore, represents an important shift from traditional instruction toward technology-enhanced pedagogy that supports individualized learning trajectories.

Beyond language education, AI adoption has become increasingly relevant in vocational and technical education. Vocational institutions are expected to prepare graduates who possess competencies aligned with rapidly changing industrial environments shaped by digitalization and Industry 4.0. Recent studies indicate that AI integration in vocational education can improve instructional efficiency, enhance student engagement, and strengthen competency acquisition through adaptive learning systems, simulation technologies, and automated evaluation mechanisms (Aryanti & Santosa, 2024; Masita

& Rossydi, 2021; Rossydi et al., 2026). AI also enables experiential learning approaches that mirror workplace conditions and foster the development of practical, job-oriented skills. In technical fields, including aviation-related education, AI applications have shown potential to support simulation training, procedural learning, operational decision-making, and performance monitoring. Nevertheless, successful implementation depends not only on technological availability but also on institutional readiness, educator competence, infrastructure, and strategic policy support.

Despite the growing body of evidence supporting AI integration in language learning and vocational education, important research gaps remain. Existing studies have primarily examined AI implementation in general higher education contexts and focused on outcomes such as personalization, automated feedback, chatbot interaction, and assessment efficiency (Matos et al., 2025; Yang et al., 2023; Zou et al., 2023). Research in vocational education has generally explored opportunities and implementation barriers, but has mainly focused on industrial training and broad technical education contexts rather than specialized vocational institutions (Q. Zhang, 2025). Similarly, studies in AI-assisted language learning have mostly evaluated specific tools for speaking and pronunciation improvement without examining broader institutional adoption processes, stakeholder readiness, and contextual implementation factors (Aryanti & Santosa, 2024; Zou et al., 2023).

More importantly, there remains limited empirical evidence on how Artificial Intelligence is implemented in aviation vocational education, particularly in supporting English language learning through an integrated pedagogical approach that considers institutional readiness, lecturer practices, student engagement, and competency-oriented instruction. Existing studies rarely address how AI can be systematically embedded into aviation training environments where language proficiency and technical competence are equally essential. This creates a significant research gap that warrants investigation in specialized aviation education settings.

This study was conducted at Makassar Aviation Polytechnic, an Indonesian vocational higher education institution that prepares future aviation professionals. In line with developments in the aviation industry that increasingly incorporate AI for operational optimization, intelligent systems, and decision support, educational institutions are expected to adapt their instructional practices accordingly. However, preliminary observations indicate that AI implementation in this context remains fragmented due to infrastructure limitations, varying levels of AI literacy, limited institutional policies, and uneven integration into teaching and learning activities. Consequently, AI use has not yet been fully optimized within competency-based vocational education.

The novelty of this study lies not only in addressing the limited evidence on AI implementation in aviation vocational education but also in proposing an AI integration perspective tailored to the aviation vocational context. Rather than merely evaluating the effectiveness of AI tools, this research conceptualizes AI integration as a collaborative instructional ecosystem encompassing lecturers, students, institutional readiness, and language-learning objectives. The findings are expected to contribute to an evidence-based model for integrating AI into aviation-oriented language education that supports both technical competency development and English communication skills.

Therefore, this study aims to investigate the implementation of Artificial Intelligence in English language learning at Makassar Aviation Polytechnic. Specifically, the study seeks to: (1) examine how lecturers and students perceive and utilize AI in teaching and learning activities; (2) identify challenges and opportunities in integrating AI into vocational language education; and (3) formulate recommendations for AI integration practices suitable for aviation vocational learning environments.

## II. Method

This study employed a sequential explanatory mixed-methods design consisting of quantitative and qualitative phases. The quantitative phase was conducted first to identify patterns of Artificial Intelligence (AI) use in English language learning, followed by a qualitative phase to explain and deepen the quantitative findings through open-ended questionnaires, interviews, and classroom observations.

This study employed a sequential explanatory mixed-methods design, consisting of quantitative and qualitative phases conducted consecutively to obtain a comprehensive understanding of the implementation of Artificial Intelligence (AI) in English language learning. The quantitative phase was conducted first to identify patterns of AI use, perceptions of effectiveness, and user challenges using survey data. Subsequently, the qualitative phase was conducted to explain and elaborate on the quantitative findings using open-ended questionnaires, semi-structured interviews, and classroom observations. This design was selected because it enables statistical findings to be interpreted in the context of actual teaching and learning practices.

The study was conducted at Makassar Aviation Polytechnic, Indonesia. Participants included five English lecturers and 82 students with prior experience using AI in English learning activities. Participants were selected through purposive sampling to ensure respondents had direct experience with AI-supported learning practices and could provide relevant insights into AI implementation. Student participants represented semesters 1, 3, and 5 from

three study programs, namely Airport Technology, Air Navigation Technology, and Aircraft Maintenance Engineering. Lecturer participants had teaching experience ranging from three to five years. Demographic information collected included age, gender, semester level, study program, teaching experience, and prior experience using AI tools to support contextual interpretation of the findings.

Data were collected using both quantitative and qualitative instruments. The quantitative phase employed a structured questionnaire adapted from previous studies on AI integration in education and language learning. The questionnaire was designed to examine participants' perceptions and experiences regarding AI implementation in English learning and consisted of five dimensions: frequency of AI use, perceived effectiveness, benefits of AI integration, implementation challenges, and support for English-speaking development. Responses were measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The adaptation process involved translation and contextual modification to suit the aviation vocational education environment.

The qualitative phase utilized open-ended questionnaires, semi-structured interviews, and classroom observations. The interviews explored participants' experiences, opportunities, and challenges associated with integrating AI into English learning. Classroom observations were conducted to examine actual implementation practices, including lecturer facilitation, student engagement, interaction patterns, and AI-supported speaking activities. Observation findings were documented using observation notes and structured observation indicators.

To ensure the quality of the research instruments, content validity was established through expert judgment involving specialists in English Language Teaching, Educational Technology, and Vocational Education. The experts evaluated the questionnaire on relevance, clarity, appropriateness of language, and suitability for the aviation vocational context. Following expert review, revisions were implemented, and the instrument was pilot-tested on 24 respondents with characteristics similar to those of the target participants to assess clarity and practicality. Internal consistency reliability was examined using Cronbach's Alpha coefficient, with values of 0.70 or above considered acceptable for educational research. Since the study was exploratory and implementation-oriented, the questionnaire was primarily used to identify trends and perceptions related to AI integration rather than to establish psychometric measurement constructs.

Data collection was conducted in several stages. First, questionnaires were distributed to identify patterns of AI implementation and perceived effectiveness in English learning. Second, qualitative data were collected through interviews and classroom observations. To strengthen trustworthiness, data triangulation was conducted by

comparing findings obtained from questionnaires, interviews, open-ended responses, and classroom observations.

Quantitative data were analyzed using descriptive statistics, including frequencies, percentages, means, and standard deviations. Qualitative data were analyzed using thematic analysis through several stages: familiarization with the data, initial coding, category development, theme generation, and interpretation. Coding was conducted manually by organizing responses into recurring categories and identifying emerging themes. The analysis generated themes related to the effectiveness of AI implementation, challenges of AI adoption, lecturer readiness, student engagement, institutional support, and perceived contributions to English-speaking development. Finally, quantitative and qualitative findings were integrated during interpretation to provide a comprehensive understanding of AI implementation in vocational English learning.

### III. Results and Discussion

#### Quantitative

The survey results showed that implementing Artificial Intelligence (AI) in English teaching at career-focused colleges is occurring at only a moderate rate. Most students (62%) and teachers (58%) said they had used AI programs such as translation helpers, voice-to-text tools, or online learning sites, but they didn't use them very often. Basic math showed that students thought AI improved their speaking skills, with a score of 3.8 out of 5, indicating they mostly felt positive about it but remained cautious. Looking at the data in another way showed that younger teachers and students in airplane-related programs were usually more confident and used AI tools more often than those in other fields.

The survey results indicate that the implementation of Artificial Intelligence (AI) in English language learning at vocational higher education institutions remains at a moderate level of adoption, suggesting that AI has been introduced into learning practices but has not yet become a fully integrated instructional component. As presented in Table 1, 62% of students and 58% of lecturers reported using AI applications, including translation tools, speech recognition systems, and interactive learning platforms. Although the majority of respondents had experience with AI-supported learning, the relatively low proportion suggests that AI use remains uneven across users and contexts.

Students generally perceived AI positively, particularly regarding its contribution to English-speaking development. The average effectiveness score was 3.8 out of 5, indicating that respondents considered AI beneficial for improving pronunciation, fluency, and vocabulary development, while remaining cautious about overreliance on technology. This finding suggests that students

recognize the value of AI as a supportive learning tool but continue to regard human interaction as essential for developing authentic communication skills.

Further analysis of usage patterns revealed variation in AI engagement frequency. Approximately 30% of students reported high-frequency use ( $\geq 3$  times per week), 32% reported moderate use (1–2 times per week), and 38% reported rare use ( $< 1$  time per week). Students with more frequent AI exposure consistently reported greater confidence and stronger perceived improvement in speaking performance. This pattern suggests that AI effectiveness may depend not only on tool availability but also on sustained, repeated engagement. These findings support previous studies showing that regular interaction with AI-supported language-learning environments leads to greater gains in speaking performance and learner confidence (Fathi et al., 2024; Zou et al., 2023).

Demographic comparison further showed that younger lecturers and students in aviation-related programs demonstrated higher confidence and more frequent AI use

than their counterparts. Rather than reflecting simple differences in technological familiarity, this pattern suggests that contextual relevance influences adoption behavior. Aviation education is strongly associated with simulation-based training, digital systems, and operational communication, creating conditions in which AI is perceived as professionally relevant and instructionally meaningful. Similar observations have been reported in recent studies, which emphasize that institutional context and perceived usefulness significantly influence educational AI (Guan, Li, & Gu, 2024; Matos et al., 2025; Tram et al., 2024).

Overall, the quantitative findings indicate that AI implementation shows promising potential but remains inconsistent across users. Therefore, increasing effectiveness requires more than technological access; it also requires structured instructional integration, lecturer readiness, and institutional support to encourage sustained and meaningful AI engagement.

Table 1. Quantitative Data

| Variable                                  | Category                                | Frequency / % | Mean Score (1–5) | Key Observation                                                                                                                   |
|-------------------------------------------|-----------------------------------------|---------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| AI Usage by Students                      | Used AI applications                    | 62%           | –                | The majority of students reported using AI tools such as translation apps, speech recognition, or interactive learning platforms. |
|                                           | Did not use AI applications             | 38%           | –                | Some students have limited exposure or familiarity with AI in learning contexts.                                                  |
| AI Usage by Lecturers                     | Used AI applications                    | 58%           | –                | Slightly lower than students, lecturers employ AI mainly for lesson preparation and feedback.                                     |
|                                           | Did not use AI applications             | 42%           | –                | Indicates potential need for professional development and training.                                                               |
| Perception of AI Effectiveness (Students) | –                                       | –             | 3.8              | Generally positive perception of AI effectiveness in enhancing speaking skills, though a cautious attitude persists.              |
| Frequency of AI Use                       | High ( $\geq 3$ times/week)             | 30%           | –                | Frequent users report greater confidence and perceived effectiveness.                                                             |
|                                           | Moderate (1–2 times/week)               | 32%           | –                | Occasional users benefit partially but may not realize full potential.                                                            |
|                                           | Low / Rare ( $< 1$ time/week)           | 38%           | –                | Limited exposure reduces potential skill gains and confidence.                                                                    |
| Confidence by Demographics                | Younger lecturers & aviation students   | –             | –                | Tend to demonstrate higher confidence and more frequent AI use.                                                                   |
|                                           | Older lecturers & non-aviation students | –             | –                | Use AI less frequently and show lower confidence in technology integration.                                                       |

Further analysis revealed variation in respondents' AI use frequency. Approximately 30% of students reported frequent use ( $\geq 3$  times per week), 32% reported moderate use (1–2 times per week), and 38% reported rare use ( $< 1$  time per week). This pattern aligns with their perceived effectiveness: students who engaged in AI-supported activities more consistently reported greater improvement in pronunciation, fluency, and vocabulary retention, confirming the importance of sustained engagement for meaningful learning outcomes (C. Li et al., 2019; Zou et al., 2023).

Cross-tabulation analysis of demographic variables showed that younger lecturers and students in aviation-related programs reported higher confidence and used AI more frequently than their older or non-aviation counterparts. This finding suggests that familiarity with technology and relevance to the field influence the adoption of AI tools, aligning with previous studies emphasizing the importance of contextual factors in AI-mediated learning (Aryanti & Santosa, 2024; Maulana & Suharto, 2024; Rossydi et al., 2025).

Cross-tabulation analysis revealed that younger lecturers and students in aviation-related programs reported higher confidence and more frequent use of AI than their older or non-aviation counterparts. However, this difference should not be interpreted solely because of age or digital familiarity. A more meaningful explanation lies in the interaction between professional demands, learning culture, and perceived relevance of AI to future occupational contexts. Aviation education is inherently technology-intensive and routinely exposes learners to simulation-based instruction, digital communication systems, operational procedures, and performance monitoring environments. Consequently, aviation students may perceive AI as a natural extension of professional preparation rather than merely an additional educational tool. Previous studies suggest that learners are more likely to adopt educational AI when technologies are closely aligned with disciplinary expectations, institutional readiness, and authentic task requirements (Matos et al., 2025). This exposure appears to strengthen learners' confidence, reduce uncertainty toward technology adoption, and encourage sustained engagement with AI-supported language learning (Fathi et al., 2024; C. Li et al., 2019). In contrast, students in non-aviation contexts may encounter fewer opportunities to integrate AI into authentic communication tasks, resulting in lower confidence and less frequent use. Therefore, confidence in AI implementation appears to emerge not only from access to technology but also from the alignment of instructional practices with professional identity development.

These findings extend previous research on AI-assisted language learning by suggesting that successful AI implementation in vocational education is context-dependent rather than technology-dependent. While previous studies frequently emphasize accessibility, personalization, and immediate feedback as primary factors influencing AI adoption, the present findings indicate that institutional culture, vocational orientation, and perceived professional value are equally important determinants (Ma & Chen, 2025; Zou et al., 2023). This interpretation contributes to theory by positioning the vocational context as a mediating factor that shapes learners' willingness to engage with AI, their confidence in using AI-supported learning environments, and the sustainability of technology integration. In this regard, AI effectiveness should not be understood as an inherent property of the technology itself but as an outcome of interactions among learners, educators, and institutional ecosystems (Matos et al., 2025; Q. Zhang, 2025).

Beyond confirming that AI positively supports English-speaking development, the present study offers a practical and theoretical contribution by proposing a contextual interpretation of AI integration for vocational education. The findings demonstrate that successful implementation does not occur automatically through access to AI tools but emerges through the interaction of

four interconnected dimensions: pedagogical design, learner engagement, institutional support, and human facilitation. Students who demonstrated higher speaking confidence and perceived improvement were not necessarily those who used the most sophisticated AI tools, but those who engaged consistently within structured learning environments supported by lecturers and meaningful classroom activities. These findings support previous studies arguing that AI produces stronger educational outcomes when intentionally integrated into instructional design rather than used as a stand-alone technological intervention (Ma & Chen, 2025; Muliati et al., 2023; Q. Zhang, 2025).

Based on these findings, this study proposes a Human-Centered AI Integration Model for Vocational English Learning. In this model, AI functions as a learning partner that supports repetitive speaking practice, immediate corrective feedback, flexible learning opportunities, and individualized learning pathways. However, lecturers remain responsible for providing pedagogical scaffolding, contextual interpretation, emotional support, and opportunities for authentic communication. Institutional readiness including infrastructure, curriculum integration, and digital literacy serves as the enabling mechanism that sustains implementation. This model aligns with recent studies that emphasize that AI should complement rather than replace human interaction and that hybrid instructional approaches yield stronger language outcomes than technology-only environments (Fathi et al., 2024; Matos et al., 2025; D. Zhang & Pérez-Paredes, 2024).

In practice, the proposed model provides guidance for vocational institutions seeking to implement AI in language education. Rather than adopting AI as an isolated innovation initiative, institutions should establish structured AI-supported speaking activities, strengthen lecturer readiness, align AI use with workplace communication needs, and ensure adequate technological support. The proposed framework contributes to educational practice by offering a context-sensitive approach that may guide AI integration beyond aviation settings and into broader vocational environments where professional competence and communication ability must develop simultaneously (Yang et al., 2023; Zou et al., 2023).

Overall, these quantitative findings show that while AI adoption is promising, its implementation remains limited and uneven. This calls for targeted strategies, such as professional development for lecturers, structured integration into curricula, and infrastructure support, to improve both the frequency and effectiveness of AI use in vocational English education.

The survey results revealed that students' perceptions of AI in English-speaking practice were generally positive, with a mean score of 3.8 out of 5 on AI effectiveness in enhancing speaking skills. About 62% of students reported using AI-based applications, such as translation tools,

speech recognition software, and interactive learning platforms, though the frequency of use varied. Cross-tabulation analysis indicated that students in aviation-related programs tended to use AI more frequently and showed greater confidence in interacting with AI tools than students from other disciplines. Thematic analysis of open-ended responses highlighted several nuanced perspectives. Many students valued AI for reducing speaking anxiety, providing immediate feedback, and allowing flexible, self-paced practice. AI was particularly useful for improving pronunciation, fluency, and vocabulary. However, some students preferred face-to-face practice with peers and lecturers, perceiving such interactions as more authentic, socially engaging, and meaningful for real-world communication.

Lecturers expressed cautious optimism, recognizing AI's potential to supplement traditional instruction and enhance student engagement. Nevertheless, they emphasized that AI cannot replace human interaction, especially in aviation contexts where professional, pragmatic, and context-specific communication is essential. The lack of socio-cultural and nuanced feedback in AI-mediated learning was considered a significant limitation. These findings align with previous studies. (Matos et al., 2025) noted that while AI can enhance efficiency and personalized learning, it cannot replicate the socio-cultural dimensions of human teaching. (Zou et al., 2023) also highlighted the effectiveness of blended learning models that combine AI tools with face-to-face instruction to maximize outcomes.

Regarding interactional experiences, students expressed mixed perceptions of AI-mediated speaking practice. Many students appreciated AI for providing a safe, judgment-free environment where they could practice speaking without fear of embarrassment, which helped reduce anxiety and build confidence in using English. The immediacy of feedback and the ability to practice repeatedly at their own pace were highlighted as particularly beneficial features.

Despite the advantages of AI in language learning, students emphasized that interactions with lecturers and peers remained more authentic and socially engaging. They reported that human-mediated communication allowed for nuanced feedback, emotional support, and the development of pragmatic and cultural competencies that AI alone could not provide. This aligns with findings by (Smith et al., 2023) who noted that face-to-face interactions foster deeper interpersonal connections and facilitate the acquisition of cultural nuances in language use. Similarly, (Johnson & Lee, 2022) highlighted the role of peer interactions in enhancing communicative competence, as they provide opportunities for real-time feedback and collaborative learning. These observations suggest that AI is most effective as a complementary tool rather than a replacement for human interaction in language learning. As (Tai & Chen, 2024), while AI can

offer personalized learning experiences, it cannot replicate the complex social dynamics and emotional intelligence inherent in human interactions. Therefore, integrating AI with traditional teaching methods that emphasize human connection can create a more holistic and effective language learning environment.

The findings align with prior research on blended and hybrid learning (Rossydi et al., 2023; Zou et al., 2023) that hybrid learning models, which integrate AI tools with classroom activities, maximize the advantages of technology while preserving the essential social and affective dimensions of language learning. Similarly, hybrid approaches to speaking instruction, in which AI manages structured, repetitive practice and provides immediate feedback, while human instructors and peers facilitate contextual understanding, nuanced communication, and socio-emotional engagement, are increasingly recognized as the most effective model. For instance, (Ma & Chen, 2025) demonstrated that language learners in AI-assisted environments with teacher scaffolding achieved significantly higher learning outcomes and motivation than those relying solely on AI or traditional instruction, underscoring the indispensable role of human mediation. (D. Zhang & Pérez-Paredes, 2024) found that EFL learners who interacted with generative AI chatbots reported lower speaking anxiety and a higher willingness to communicate than those in non-AI conditions. Likewise, in their systematic review, (Lai et al., 2026; Lin et al., 2017) found that AI chatbots can effectively reduce learners' anxiety and enhance their willingness to communicate when integrated into peer-based and collaborative learning frameworks. Together, these findings highlight that the optimal use of AI in language instruction lies in balanced, human-centered designs that merge technological efficiency with interpersonal interaction. Furthermore, (Fathi et al., 2024) that sustained AI-mediated speaking practice enhances enjoyment and willingness to communicate while reducing anxiety, confirming that the affective dimension of learning benefits most from hybrid instructional models.

Moreover, Q. Zhang, (2025) underscored that responsible and effective AI adoption in higher education requires iterative, design-based integration involving both educators and learners. Their findings demonstrate that a well-structured Action Design Research approach can evolve chatbots from simple rule-based systems into adaptive, GPT-enhanced tools that foster motivation and engagement through pedagogically grounded frameworks such as Keller's ARCS model. This reinforces the current study's emphasis on intentional design, human scaffolding, and ethical alignment in AI-supported instruction.

Together, these findings highlight that the optimal use of AI in language education lies in balanced, human-centered designs that merge technological efficiency with

interpersonal interaction. Students' perceptions also supported this view; they regarded AI as a valuable complement rather than a replacement for lecturer and peer interaction, particularly in developing communicative competence and affective engagement.

#### A. Qualitative

Qualitative data provided richer insights into these patterns. The thematic analysis of the students' open-ended responses on the use of Artificial Intelligence (AI) in speaking practice revealed six interrelated themes:

benefits, challenges, frequency of use, perceived effectiveness, interactional experiences, and recommendations for further development.

As Table 1 illustrates, students highlighted flexibility and accessibility as the main benefits, enabling them to practice anytime and anywhere without the constraints of classroom schedules. One student explained: "I can practice anytime, even at night, without worrying about class schedules."

Table 2. Thematic Analysis of Student Responses on AI Use in English Speaking Practice

| Theme                  | Sub-theme                              | Example Responses (Student Quotes)                                                | Frequency / % <sup>a</sup> |
|------------------------|----------------------------------------|-----------------------------------------------------------------------------------|----------------------------|
| Benefits of AI         | Flexibility & accessibility            | "I can practice anytime, even at night, without worrying about class schedules."  | 72%                        |
|                        | Pronunciation & vocabulary improvement | "AI corrects my pronunciation immediately, helping me remember new words faster." | 65%                        |
|                        | Motivation & confidence                | "I feel less nervous speaking English because AI won't judge me."                 | 68%                        |
| Challenges             | Technical issues                       | "The internet connection is often unstable, and sometimes the app freezes."       | 58%                        |
|                        | Complexity & misunderstanding          | "Some AI responses are too complicated, and I get confused."                      | 47%                        |
|                        | Privacy & cost concerns                | "I worry about how my data is stored and the cost of premium features."           | 35%                        |
| Frequency of Use       | Regular practice                       | "I use AI almost every day to practice pronunciation and conversation."           | 45%                        |
|                        | Occasional use                         | "I only use it when I have free time or need to prepare for class."               | 30%                        |
|                        | Rare / never                           | "I haven't used AI because I don't know how it works."                            | 25%                        |
| Effectiveness          | Improvement in speaking skills         | "After a few weeks, I noticed my speaking became smoother and more accurate."     | 62%                        |
| Interaction Experience | Dependence on frequency                | "The more often I use it, the more confident I feel speaking."                    | 58%                        |
|                        | Comfort & confidence                   | "It's easier to practice with AI than in front of classmates."                    | 60%                        |
|                        | Preference for human interaction       | "Talking to a teacher or friend feels more natural."                              | 40%                        |
| Suggestions            | Hybrid integration                     | "Combine AI practice with in-class discussions or presentations."                 | 55%                        |
|                        | Gamification & challenges              | "Weekly speaking challenges with AI would make it more fun."                      | 48%                        |
|                        | Personalized feedback                  | "AI should adapt to my level and give more specific corrections."                 | 52%                        |

Research shows that artificial intelligence (AI) technology has brought positive results to students who learn through speaking practice. Most respondents indicated that AI enabled them to practice anytime, anywhere, thanks to its flexible, accessible features that worked with common devices, including smartphones and tablets. AI provides students with both convenience and academic benefits by delivering immediate, personalized feedback that helps them improve their pronunciation, grammar, and vocabulary. The learning system enabled students to detect their mistakes immediately, thereby improving skill acquisition.

AI produces positive emotional effects, leading to reduced speech anxiety, increased self-confidence, and greater active participation. AI practice sessions create a judgment-free environment, making students feel more comfortable practicing than during their regular classroom activities. Research by (Ahmed O. Alharbi, 2022) shows

that AI-based language learning systems help students build internal motivation, develop language proficiency, and reduce language learning anxiety. The study by (Wiboolyasarin et al., 2025) demonstrated that AI-powered chatbots in language-learning environments improve students' speaking and writing abilities through customized feedback and interactive learning, reducing student anxiety and demonstrating that AI tools work well for language education. Various language researchers have studied the predictive abilities of AI-based tools and chatbots in assessing student academic emotions and behaviors (Fathi et al., 2024; Kim & Su, 2024; Yang et al., 2023).

The research findings show that AI technology serves as an efficient additional resource for English-language education, enabling students to practice indefinitely, receive instant feedback, and build emotional bonds with the content. The research data show that AI effectiveness

depends on how often students use it and how they integrate it into their work, because students who used AI regularly with classroom activities achieved better results than those who used it infrequently. The implementation of AI in language education faced various challenges that limited its full educational potential. The most pressing issue was unreliable internet connectivity, which frequently disrupted practice sessions and limited access to AI tools. The research findings of (Crompton et al., 2024) noted that technology breakdowns and limited capabilities can impede the effectiveness of AI in education.

The AI-generated responses included difficult words and foreign speech patterns, making pronunciation challenging for students. Current natural language processing systems have limitations because they produce AI-mediated conversational errors. The problems match the findings (Du & Daniel, 2024; Tai & Chen, 2024). The research revealed that AI systems face technical barriers that prevent them from handling different language types effectively. The system faced three main issues: protecting student data, understanding system expenses, and ensuring the accuracy of AI feedback. Users expressed concern about how their personal information, collected by AI platforms, would be protected. This is corroborated by research by (Ingason et al., 2025), which reports that AI platforms must operate in accordance with ethical guidelines that comply with all relevant data protection laws. The challenges show that AI integration in language learning requires a method that maintains a balanced state across all elements. The implementation of AI requires immediate solutions to its current problems because these issues prevent AI from reaching its maximum potential in educational settings.

The survey results, together with case study data, show that the frequency of AI application directly affects how users assess its ability to improve their English-speaking abilities. The quantitative results showed that students who used AI daily or weekly reported better self-reported progress in their speaking skills, including fluency and pronunciation, as well as in vocabulary learning and speaking confidence. Students who used AI occasionally or rarely showed limited learning progress, whereas those who used it regularly achieved better academic results. The mean perception score for AI effectiveness among frequent users was notably higher ( $M = 4.2$ ) compared to occasional users ( $M = 3.4$ ), highlighting a clear correlation between consistent practice and perceived benefit.

Research findings confirm previous studies showing that AI-based learning activities across multiple sessions help students develop their language skills through both technical and emotional development. (Y. Li et al., 2025; Yang et al., 2023). The research demonstrated that students who used AI for speaking practice achieved better pronunciation and speaking skills. The research showed that students who used AI systems developed enhanced

technical competencies, improved motivation and communication skills, reduced foreign language anxiety, and experienced higher levels of enjoyment. Students need to experience language multiple times through repeated practice to develop their language skills.

The case study observations showed that AI benefits for language learning are most effective when AI tools are integrated through well-organized methods. The use of AI practices in weekly classroom activities by lecturers led to higher student participation, as students completed their assignments before participating in AI-based activities. The results showed that students who used AI voluntarily achieved inconsistent learning outcomes, with their participation levels varying. The research findings from Y. Li et al. (2025) demonstrated that AI chatbots integrated into course design through structured methods produced better student motivation and engagement than when students had the option to use them. The research conducted by (Guan, Li, & Michelle Gu Michelle, 2024) found that AI tools achieve their greatest educational value when teachers implement them to enhance curriculum learning through structured teaching approaches.

This emphasizes the importance of curriculum design and instructional scaffolding for AI. Educators design learning activities that help students realize AI's full potential in the classroom. As guided by (Yang et al., 2023; Q. Zhang, 2025) learners are more likely to engage consistently when their instructors provide structured activities that promote self-efficacy and reduce learning anxiety. This is beneficial for learners who need anxiety accommodations.

Findings on the impact of AI on learning are generalized based on the frequency and consistency of its use. AI-driven activities on learners' speaking skills provide enjoyment and reduce anxiety, confirming that consistent AI-driven learning improves learners' emotional stability and confidence. In a similar way, (Y. Li et al., 2025; Qiao, 2023) found that learners who used AI-based feedback systems for speaking practice improved their accuracy and fluency, as the system provided opportunities for self-correction and reinforcement through iterative cycles.

In their study, (Ahmed et al., 2024; Dewantara et al., 2024) discuss how deep learning systems in natural language processing enhance human-agent interactions by enabling better contextual understanding, improved dialogue management, and adaptable responses. The study describes how NLP-powered AI agents might assist in interactive speaking practice. NLP AI agents might provide instant feedback and tailor communication to individual needs. These findings support the current study's objective of incorporating AI-powered resources into speaking instruction in vocational higher education to promote authentic communication and learner engagement.

Yet, the current study emphasizes that human interaction is fundamental. Students view AI as an augmentation, not a substitute, for interaction with lecturers and peers, especially in the emotional and nuanced aspects of communication. (Du & Daniel, 2024; Q. Zhang, 2025) point out that AI can personalize instruction and feedback, reducing communication gaps, yet the human instructor still needs to provide authentic language, address emotional aspects of communication, and address higher-order language issues. Therefore, the best results will come from a balance between AI and human interaction, demonstrating their complementarity.

The suggested instructional strategy uses a hybrid integration approach, with AI-supported practice coexisting with in-person classroom interaction. Students appreciate the unique technological offerings of AI but have noted the importance of real-world engagement in strengthening social, affective, and cultural competencies. AI goes beyond being a simple technological tool, functioning as a partner in the integration of comprehensive, balanced, and meaningful English-language instruction.

Students' qualitative feedback demonstrated the synergy between AI and face-to-face interactions. Numerous students reported that class instruction on AI practice helped reinforce their learning, and that the practice provided a margin for independent rehearsal, with on-the-spot feedback that enabled real-world, communicative application of the skills. The presence of free AI practice alongside instruction from a human exemplifies a hybrid learning model, in which the technology is designed to support, rather than replace, classroom teaching.

In a study by (Agung Raharjo et al., 2025; Matos et al., 2025; Tram et al., 2024), AI technologies in education were investigated. AI tools like ChatGPT and GPT-4 are significantly supporting personalized learning and learner engagement. AI improves critical thinking, communication, and motivation in various educational contexts. This has motivated the current study, which aims to implement AI tools to facilitate the teaching of speaking skills in vocational higher education. Professional communication is developed in authentic, interactive, and adaptive contexts, thereby fostering environments that are adaptive and learning.

To reiterate the main points, the use of AI to improve speaking skills depends on the amount of AI incorporated into the activities and on the structure of those activities. Substantial improvements in fluency, pronunciation, vocabulary, confidence, and, most importantly, anxiety and motivation are attainable through consistent, supportive, guided practice. These findings prompted the need for more intentional and thoughtful use of AI in the vocational language curriculum.

The research shows that AI functions as a vital tool that improves English-speaking practice, with both numerical and non-numerical findings. The system achieves its best results through hybrid integration, combining AI-based exercises with human contact to build both technical speaking skills and social, affective, and cultural competencies.

### Synthesis

By examining these outcomes, AI has significant potential to enhance students' English-speaking skills by improving their fluency, accuracy, and confidence. The benefits of using AI in vocational higher education are not universal, as the landscape is fragmented and inconsistent, reflecting differences in technological access, institutional support, and user acceptance. This study helps to address major research gaps in the field. It provides concrete evidence of how AI can improve aviation-related vocational education by enhancing speaking proficiency, a subject that has received little research attention. It also captures the thoughts, fears, and desires of both students and teachers, offering a dual perspective that is often overlooked in earlier studies. Finally, it stresses the need to develop a model for the applied, collaborative implementation of AI tailored to the context of Indonesian vocational institutions, considering technological innovation, infrastructural capacity, and pedagogical realities. Together, these insights offer both theoretical understanding and practical guidance on how AI can be effectively integrated into language instruction within vocational education settings.

## IV. Conclusion

This research indicates that integrating Artificial Intelligence (AI) into English-language instruction is highly beneficial for vocational higher education students. These findings suggest that artificial intelligence can increase learners' motivation, interest in learning, and confidence through providing a safe, flexible environment for interactive learning. By providing real-time feedback and practice opportunities, AI facilitates the acquisition of pronunciation, fluency, and vocabulary at any time. Despite these benefits, students encounter numerous technical and pedagogical obstacles. Several significant hurdles include unstable internet connections, complex features, occasional glitches in AI-assisted conversations, and doubts about the legitimacy of the feedback. Additional concerns regarding cost, privacy, and AI's inability to convey natural communicative nuances necessitate robust infrastructure and explicit institutional guidelines (and integration strategies that consider both viability and effectiveness).

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