p-ISSN 2252-7427, e-ISSN 2541-3635
https://ieflj.uniku.ac.id/pub

p-ISSN 2252-7427 e-ISSN 2541-3635
Indonesian EFL Journal
AISEE
The Association of Indonesia Scholars of English Education

ARTIFICIAL INTELLIGENCE ON EFL IN VOCATIONAL HIGH SCHOOL: THE IMPACT OF TALKPAL.AI ON SPEAKING SKILL

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APA Citation: Santoso, M., Anwar, K., & Maruf, N. (2025). Artificial intelligence on EFL in vocational high school: the impact of Talkpal.AI on speaking skill. *Indonesian EFL Journal, 11*(3), 625-638. https://doi.org/10.25134/ieflj.v11i3.41

Received: 22-08-2025 Accepted: 07-10-2025 Published: 30-10-2025

Abstract: The integration of Artificial Intelligence (AI) into English as a Foreign Language (EFL) teaching has transformed how learners practice speaking, offering interactive, adaptive, and anxiety free environments. However, while AI tools have shown significant benefits in higher education, their use in vocational high schools where communication skills must align with industry specific needs remains underexplored. Most prior studies focus on university contexts, overlooking vocational learners who require workplace-oriented communication training. This study examines the impact of Talkpal.AI, an AI-based conversational platform, on vocational high school students' English-speaking proficiency, focusing on fluency, accuracy, and communicative confidence. Using a mixed-methods design, seventy students were divided into experimental and control groups. The experimental group practiced with Talkpal.AI for six weeks, while the control group followed traditional instruction from teacher with same time. Quantitative result indicated a significant improvement in the experimental group's speaking performance ($p < .001$, Cohen's $d = 1.45$), particularly in fluency and pronunciation, confirming Talkpal.AI's effectiveness in enhancing oral proficiency. Qualitative findings indicated that Talkpal.AI fostered confidence and reduced anxiety, yet students required extensive scaffolding to use the AI effectively for self-directed learning. Initial difficulties included interpreting feedback, sustaining motivation, and managing technical barriers. The study concludes that AI-assisted speaking practice enhances communicative competence when integrated with structured teacher guidance and reflective learning strategies, reinforcing AI's potential as a pedagogical partner in vocational EFL context.
Keywords: *Artificial Intelligence (AI); Talkpal.AI; EFL speaking skills; Vocational High School; mixed methods.*

INTRODUCTION

The advent of Artificial Intelligence (AI) is heralding a paradigm shift in language education, moving beyond static, one size fits all approaches to offer dynamic, personalized learning journeys (Arani, 2024; Ulfa, 2023; Vorobyeva et al., 2025; Zuhri et al., 2021). AI powered tools, particularly conversational agents, can provide limitless opportunities for interactive speaking practice in a low anxiety environment, offering immediate, adaptive feedback that was once the sole domain of human tutors (Dou et al., 2025; et al Putranta, 2020; Wiboolyasarin et al., 2025). This capability is crucial for developing linguistic fluency and learner confidence, positioning AI not merely as a technological tool but as a transformative pedagogical partner that can scaffold learning in previously unimaginable ways (Ebadi et al., 2025; Fahmi et al., 2024; Meidyana & Salsabila, 2024; Napitupulu & Ahmad Amin Dalimunte, 2025)

Although research on using AI in English teaching is growing fast at university level showing benefits for fluency, motivation and lower speaking anxiety, most findings come from university students in general courses, not from vocational high school students who need industry specific communication (Crompton et al., 2024; Du & Daniel, 2024; Arifin et al., 2022). Studies that look at AI chatbots in vocational education are still few and are often small or pilot projects, so the evidence that speaking improvements transfer to real workplace tasks is (Gao et al., 2025; Hoang et

al., 2023; Truong & Minh, 2021) almost no empirical research investigating the use of Talkpal.AI among vocational high school students that measures aspects of speaking skills such as fluency, accuracy, comprehensibility, and communicative readiness in EFL learning contexts (Li et al., 2025; Pituxcoosuvarn et al., 2025; Qiao & Zhao, 2023).

While the potential of AI is global, its application addresses context specific challenges. In Indonesia, English language education in Vocational High Schools (SMK) faces a critical dilemma (Maruf & Helingo, 2022; Octavia et al., 2019; Hidayani et al., 2025). The national curriculum emphasizes communicative competence to prepare students for the globalized workforce, yet the reality in many classrooms is characterized by significant constraints. These include large class sizes, limited teaching hours, a shortage of teachers proficient in conversational English, and high levels of student anxiety when speaking (Hayuningsih et al., 2025; Rahmawati et al., 2025; Song & Rabu, 2025). Consequently, there is a persistent gap between the goal of producing work ready graduates with functional English skills and the actual communicative abilities of students upon completion of their studies. This gap directly impacts their employability and competitiveness in sectors like tourism, hospitality, and international trade (Hidayani et al., 2025; Hidayat, 2024; Rihatmi et al., 2025; Zary & Zary, 2025)

This research focuses on the impact of Talkpal.AI to address this precise nexus of needs. As a generative AI powered chatbot, Talkpal. AI is uniquely relevant to the academic discourse on vocational upskilling and have good contribution to second language acquisition (Apoko, 2025; Grab, 2025; Nguyen, 2025). It can simulate real world workplace scenarios such as handling customer inquiries, participating in meetings, or conducting service transactions thereby providing contextualized language practice that is directly aligned with vocational competencies (Çela et al., 2024; Pradhan, 2022; Purbasari, 2025). By offering on demand, personalized speaking practice, it directly tackles the issues of limited practice time and teacher availability endemic to the Indonesian context.

Furthermore, its role in fostering global workforce readiness is explicit. For SMK graduates, proficiency in English communication is a key differentiator in the job market, a competency increasingly demanded by employers in a globalized economy (Safira & Nadhira, 2022). By using Talkpal.AI to build fluency and confidence, students can develop a critical 21st century skill, effectively bridging the gap between their vocational training and the demands of a global labor market (Purbasari, 2025). Such technology mediated language development is crucial for preparing a competitive workforce, particularly in emerging economies where traditional educational resources are stretched. Therefore, this research does not merely investigate the impact of an AI tool on speaking skills, it explores a scalable solution to a pressing educational and socioeconomic challenge, positioning AI as a vital catalyst for enhancing both vocational pedagogy and graduate competitiveness.

This research contributes to advancing knowledge in vocational EFL education by providing empirical evidence on the effectiveness of AI driven tools like Talkpal.AI in enhancing students' practical speaking competence and communicative confidence essential for workplace readiness. It enriches existing CALL and constructivist research by contextualizing AI integration within skill based, vocational curricula, bridging technological affordances with authentic, task-oriented communication needs. Computer-Assisted Language Learning (CALL) emphasizes the use of digital technologies to facilitate language acquisition through interactive, learner-centered, and adaptive environments. CALL theory supports the idea that AI-powered conversational agents can create dynamic opportunities for authentic speaking practice, immediate corrective feedback, and personalized learning pathways, which are critical for developing communicative competence in real-life contexts. Previous CALL research (Albaqami, 2024; Oktavia Widiastuti, 2025; Shabani & Rezaei, 2023) underscores how technology-mediated input and interaction promote linguistic fluency, accuracy, and vocabulary expansion, aligning well with the objectives of this study. Complementing CALL, constructivist learning theory posits that learners actively construct knowledge through social interaction and meaningful engagement with tasks situated within authentic contexts (Vygotsky, 1978). Talkpal.AI's simulation of workplace communication scenarios exemplifies a constructivist approach, providing situated learning experiences that foster learner autonomy, motivation, and cognitive engagement. This framework explains how AI tools serve not simply as technological aids but as pedagogical partners that scaffold individual learning needs through

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task-based speaking practice. Together, these theories guide the study's inquiry into both the pedagogical effectiveness and socio-cognitive impact of AI-assisted speaking practice. They inform the design of the intervention, the measurement of speaking proficiency outcomes, and the exploration of learners' affective responses and interactional behaviors. By explicitly situating the research within CALL and constructivist paradigms, this study contributes to theory-driven, evidence-based advancements in vocational EFL pedagogy. The findings are expected to inform curriculum development that embeds interactive AI speaking modules, while offering practical implications for educators, curriculum designers, and policymakers in optimizing AI supported pedagogy to better prepare vocational graduates for global workforce communication and employability demands.

Recent studies have highlighted the effectiveness of Artificial Intelligence (AI) in improving English speaking performance in higher education. Efendi Hidayatullah (2024) found that AI pronunciation tutors significantly enhanced students' articulation accuracy and confidence in university EFL courses (Efendi Hidayatullah, 2024). Similarly, Torkhani (2025) reported that AI-powered conversational agents increased learners' fluency and spontaneous speech production through adaptive feedback (Torkhani, 2025). Dikaprio & Dahlan Diem (2024) also demonstrated that AI integration expanded students' vocabulary and oral expression in academic communication tasks (Dikaprio & Dahlan Diem, 2024).

While these studies confirm AI's success in improving pronunciation, fluency, and vocabulary among university students, little is known about its impact in vocational high schools, where communication skills are industry specific. Therefore, this research extends this research by examining Talkpal.AI within EFL vocational contexts to bridge this critical gap.

Despite extensive research highlighting AI's positive impact on EFL learning in university contexts, limited studies have explored how Talkpal.AI supports vocational high school learners who require specialized communication skills aligned with industry-specific tasks. This gap underscores the need to investigate AI's role in enhancing practical, workplace-oriented English proficiency.

The primary objective of this research is to investigate the impact of Talkpal.AI on vocational high school students' English-speaking skills, focusing on how this AI-powered conversational platform enhances their fluency, accuracy, and communicative confidence in EFL learning contexts. Additionally, the research aims to identify the challenges students face when integrating Talkpal.AI into their speaking practice, particularly in aligning language use with industry-specific communication needs. To achieve these goals, the research addresses two key questions: (1) What is the impact of using Talkpal.AI on vocational high school students' English-speaking skills? (2) What challenges do students encounter when using Talkpal.AI for speaking practice in EFL classrooms?

METHOD

This research used mix method design. Mix method design is used to comprehensively investigate the impact of Talkpal.AI on vocational EFL students' speaking proficiency and learning experiences. This method used because of the complexity of the research problem. Speaking proficiency improvement is not only a quantifiable outcome but also a contextually and emotionally situated experience influenced by learners' confidence, engagement, and digital adaptability. Quantitative data alone could not capture these nuanced affective and behavioral dimensions. Therefore, integrating qualitative interviews allowed for triangulation and deeper interpretation of how and why changes occurred. The quantitative component was used to measure measurable improvement in speaking performance through pretest and posttests, while the qualitative component explored students' challenges and responses toward AI assisted learning. A quantitative method is used to know the impact of English-speaking skills students using Talkpal.AI on EFL in Vocational High School. The design allowed for the comparison of speaking skill improvements between the group of students used Talkpal.AI and another group used traditional methods. Both groups gave pretests and posttests to measure students' speaking ability. After giving pretests, experimental group gave intervention using Talkpal.AI and control group used traditional in learning. After intervention, both groups gave posttest. To know the challenges of English-speaking skills students using Talkpal.AI on EFL in Vocational High School used a qualitative method, it is to support the data of quantitative. The instrument used interview of the population. This integrated approach allowed for a deeper understanding of not only whether Talkpal.AI enhances speaking skills but how and why it affects

learners' impact such as confidence, and interaction patterns. The two strands were connected at multiple points: qualitative data were collected to explain and elaborate on quantitative outcomes, while quantitative results guided the selection of interview participants to represent varying degrees of speaking improvement. By treating the qualitative strand as an integral part of the research design rather than an afterthought, the study provides a richer, more nuanced account of AI-supported language learning in vocational education settings. This structure facilitates triangulation and strengthens the validity of the findings by capturing both statistical trends and underlying learner experiences within a unified framework.

The research was carried out at SMK Negeri 1 Tuban, Kabupaten Tuban, East Java, Indonesia. The participants consisted of 70 eleventh-grade students who were chosen on the basis of their preparedness to use digital technologies in the classroom and their past experience learning foreign languages. The active use of technology in the classroom and the encouraging atmosphere for putting creative teaching methods into practice are the main reasons this school was selected. The sample size and demographic characteristics were carefully documented to guarantee the validity of the research's conclusions and their contextual significance.

The duration of the research was eight weeks. In the first week, both groups took a pre-test to know their speaking proficiency before the intervention. After that, Talkpal.AI was made available to the experimental group, and they received some quick instruction on how to utilise it, whereas the control group took part in English sessions under the instructor's guidance utilizing conventional techniques. The experimental group received an initial orientation session lasting approximately 90 minutes prior to the six-week intervention period. During this session, students were introduced to Talkpal.AI through a detailed lesson plan and usage protocol developed specifically for the study. The instruction included the following components: (1) Introduction to Talkpal.AI Platform: students were briefed on the purpose and features of Talkpal.AI as an AI-powered conversational chatbot tailored for vocational English communication practice. The facilitator demonstrated the interface, navigation, and available speaking modules to familiarize learners with the tool. (2) Guided Demonstration: the teacher modeled a sample conversation scenario relevant to workplace communication, illustrating how to interact with the AI, respond to prompts, and interpret corrective feedback provided by the system in real time. (3) User Practice with Support: students then engaged in hands-on practice using Talkpal.AI, performing guided exercises under instructor supervision. During this phase, teachers provided immediate technical assistance and answered questions, ensuring students understood how to navigate the platform, maximize the adaptive feedback features, and self-correct pronunciation and vocabulary errors using the chatbot's cues. (4) Usage Protocol and Expectations: clear guidelines were communicated regarding daily practice, students were instructed to spend at least ten minutes per day engaging with Talkpal.AI, focusing on speaking modules designed to enhance fluency, accuracy, vocabulary, and pronunciation. Expectations for consistent use, self-monitoring, and reflection on feedback were emphasized. The orientation also included distribution of a user manual summarizing key steps and troubleshooting tips to assist independent learning throughout the intervention. This structured preparatory training ensured all participants started with a uniform understanding of the tool and optimized the reliability of the intervention's implementation.

After receiving orientation, the experimental group engaged in daily speaking practice using Talkpal.AI for ten minutes over a six-week period. In contrast, the control group participated in conventional English-speaking instruction based on the existing vocational curriculum. This involved teacher led activities including structured drills focusing on pronunciation and sentence patterns, pair and group work for conversational practice, and textbook exercises emphasizing functional English relevant to vocational contexts. Sessions were conducted under the direct supervision of the teacher, who provided immediate corrective feedback and guided practice on typical workplace dialogues. The total daily practice time matched that of the experimental group at ten minutes across six weeks. This detailed delineation of instructional approaches ensures a valid comparison between AI assisted personalized learning and traditional teacher facilitated speaking practice, thereby strengthening the study's internal validity. In the eight weeks after the conclusion of the intervention session, a posttest was given to measure how each group's speaking abilities had changed.

To know the challenges of English-speaking skills students using Talkpal.AI on EFL in

p-ISSN 2252-7427, e-ISSN 2541-3635
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Vocational High School, the students were given semi structured interviews with selected participants. This qualitative data complemented the quantitative findings by exploring students' experiences, difficulties, and attitudes toward using AI in EFL learning.

The data collection in this research was conducted using two complementary approaches: quantitative and qualitative data collection. The quantitative data were collected through pretests and posttests administered to both the experimental and control groups. These tests measured students'

Pre-test and post-test evaluations given both before and after the intervention were the main method used to gather quantitative data. These tests were thoughtfully created to assess students' proficiency in speaking in a number of important areas, such as pronunciation, accuracy, vocabulary utilisation, fluency, and comprehensibility. The study's purpose was to compare the pre-test and post-test outcomes in order to assess the impact of Talkpal.AI on speaking skill. To quantitatively assess students' English-speaking proficiency, this study employed the Oral Proficiency Rubric developed by H. Douglas Brown (2012) (Hutagalung et al., 2024), adapted from his validated framework for assessing speaking components in EFL contexts. This rubric evaluates five key dimensions: fluency, accuracy, vocabulary use, pronunciation, and comprehensibility. Each dimension is rated on a 5-point scale, with clear behavioral descriptors provided for each score level to ensure objective and consistent evaluation. The rubric's reliability and validity have been established in prior language assessment research and are suitable for vocational EFL learners due to its focus on communicative effectiveness and practical language use. To enhance replicability and transparency, the complete rubric with scoring guidelines is provided in Appendix A. This quantitative technique made it possible to statistically analyze the students' speaking growth by providing quantifiable proof of the educational intervention's efficacy.

Semi structured interviews were used to collect qualitative data in order to supplement the quantitative findings and document the experience aspects of the intervention. Selected students participated in semi-structured interviews to discuss their individual Talkpal experiences and difficulties in using AI as a speech training tool. Semi-structured interviews were conducted with a purposive sample of eighteen students selected from the experimental group based on their speaking proficiency across several criteria, including fluency, accuracy, vocabulary, and pronunciation. The results provided statistical evidence of the impact of Talkpal.AI compared to traditional instruction in vocational EFL settings, while the qualitative data explored participants' challenges when using Talkpal.AI for English speaking practice. Combining both datasets allowed for enriching the interpretation of results and providing a deeper insight into how AI supported learning influences speaking skill development in vocational education contexts.
variation in speaking improvement as indicated by the quantitative results. Selection criteria aimed to capture diverse learner perspectives, including high, moderate, and low performers.

The interview protocol consisted of open-ended questions focusing on students' experiences using Talkpal.AI, specific challenges encountered, perceived benefits, and attitudes toward AI-assisted speaking practice. The example of questions included: (1) Can you describe your overall experience using Talkpal.AI for speaking practice? (2) What challenges and barries have you faced when using Talkpal.AI? (3) How do you feel when speaking with Talkpl.AI instead of a real person? (4) What suggestions do you have to make Talkpal.AI more useful or suitable for vocational students? (5) How the students experience the impact of Talkpal.AI on speaking skill?

Interviews were conducted individually in a quiet setting, lasted approximately fifteen minutes each. Transcripts were prepared for qualitative content analysis. This qualitative approach enriched understanding of the quantitative findings by exploring emotional, cognitive, and contextual factors influencing the effectiveness and challenges of Talkpal.AI use in vocational EFL learning.

In depth comments were elicited by the interview methodology, which helped the researchers comprehend the complex ways in which the intervention affected the attitudes and creativity of the learners. When combined, these qualitative data sources provide a thorough, triangulated understanding of the research's emotional and cognitive results. This detailed description clarifies the number of interviewees, the selection process, and the interview protocol strengthening the validity and transparency of the qualitative strand.

The quantitative data gathered from the pre-test and post-test evaluations were analyzed using both descriptive and inferential statistical methods. Descriptive statistics, including means, standard

deviations, and percentage gains, were used to summarize students' overall performance in the five key speaking components: pronunciation, accuracy, vocabulary use, fluency, and comprehensibility. To determine whether there was a statistically significant difference between the pre-test and post-test scores, a paired sample t-test was conducted for both the experimental and control groups. Additionally, an independent sample t-test was applied to compare the performance differences between groups after the intervention. The analysis aimed to identify the extent to which Talkpal.AI contributed to measurable improvement in students' speaking proficiency. Statistical analysis was conducted using SPSS (Statistical Package for the Social Sciences) to ensure reliability, precision, and reproducibility of results. Effect size (Cohen's d) was also calculated to evaluate the magnitude of the improvement.

The qualitative data from semi-structured interviews were analyzed through a content analysis approach to interpret participants' perceptions and experiences of using Talkpal.AI for speaking practice. Each transcript was carefully reviewed, and meaningful units were identified to capture expressions related to learners' engagement, difficulties, and perceived improvement. These units were grouped into categories reflecting broader dimensions such as technological adaptation, learning autonomy, interactional engagement, and language performance challenges. The researcher then interpreted how these categories related to students' overall learning experience and the integration of AI into EFL speaking tasks.

To enhance validity, the analysis incorporated data triangulation with classroom observations and reflective notes, allowing for multiple perspectives to be compared. The interpretation process emphasized understanding the contextual and emotional realities of vocational students, recognizing how AI-based interaction influenced their confidence, persistence, and willingness to communicate in English.

To ensure the accuracy and consistency of the quantitative data, both validity and reliability tests were conducted prior to data analysis. Content validity was established through expert judgment from three EFL lecturers and language assessment specialists, who reviewed the pretest and posttest instruments to confirm that each item accurately measured the intended speaking components pronunciation, accuracy, fluency, vocabulary, and comprehensibility based on the standardized rubric by H. Douglas Brown (2012). Their feedback was used to refine test items and improve alignment with research objectives.

Construct validity was assessed by examining item correlations using Pearson's product moment correlation to determine whether test items consistently represented the same underlying construct of speaking proficiency. Meanwhile, reliability was evaluated through a Cronbach's Alpha coefficient, with values above 0.70 considered acceptable, indicating strong internal consistency across test components.

Additionally, inter rater reliability was established by employing two independent raters to score students' oral performances. The level of agreement between raters was calculated using Cohen's Kappa, ensuring objectivity and minimizing scoring bias. These procedures confirmed that the quantitative instruments used in this study were both valid and reliable for measuring the impact of Talkpal.AI on students' English speaking proficiency in vocational high schools.

To ensure the trustworthiness of the qualitative findings, this study applied the four key criteria proposed by Lincoln and Guba (1985): credibility, transferability, dependability, and confirmability.

Credibility was achieved through member checking, where interview transcripts and emerging themes were shared with selected participants to confirm the accuracy and authenticity of their responses. Peer debriefing was also conducted with two EFL experts to validate the interpretations and minimize researcher bias.

Transferability was strengthened by providing rich, detailed descriptions of the research context, participants, and data collection procedures. This allows other researchers and practitioners to determine the applicability of the findings to similar educational or vocational contexts.

Dependability was established through a clear and systematic documentation of all research steps, including interview procedures, coding schemes, and data interpretation processes. An audit trail was maintained to ensure that the research process could be replicated or reviewed for consistency.

Confirmability was maintained by ensuring that the data and interpretations were grounded in participants' actual words rather than the researcher's assumptions. Reflexive journaling was employed throughout the analysis to record potential biases and maintain objectivity.

These combined procedures ensured that the qualitative component of the study exploring the challenges and perceptions of students using

Talkpal.AI for English speaking practice was both valid and reliable, enhancing the integrity of the mixed methods design.

RESULTS AND DISCUSSION

Quantitative results

The statistical analysis revealed a significant improvement in the experimental group's speaking performance after using Talkpal.AI. The mean post-test score (M = 84.7, SD = 5.1) was notably higher than the pre-test score (M = 72.5, SD = 6.3), while the control group showed only a modest increase (M = 74.2, SD = 5.9). A paired-sample t-test indicated a statistically significant difference for the experimental group ($t(34) = 8.62$, $p < .001$), demonstrating that Talkpal.AI effectively enhanced pronunciation, fluency, and vocabulary accuracy. To provide a clearer statistical summary, Table 1 presents the pre-test and post-test means, standard deviations, t-values, p-values, and effect size for both groups. Table 1. Comparison of Pre-test and Post-test Speaking Scores between Experimental and Control Groups.

Table 1. *Comparison of pre-test and post-test speaking scores between experimental and control groups*

Group	N	Test	Mean (M)	SD	t (df)	p	Cohen's d	Significance
Experimental (Talkpal.AI)	35	Pre-test	72.5	6.3	8.62 (34)	< .001	1.45	Significant
		Post-test	84.7	5.1				
Control (Traditional)	35	Pre-test	71.8	5.9	1.21 (34)	> .05	0.22	Not significant
		Post-test	74.2	5.9				

Note: Paired-sample t-tests were conducted within each group; Cohen's d represents within-group effect size.

The results in Table 1 show that the experimental group achieved a large and statistically significant gain in overall speaking proficiency ($p < .001$, $d = 1.45$), whereas the control group's improvement was small and not statistically significant ($p > .05$). These findings confirm that Talkpal.AI substantially enhanced learners' speaking performance.

To examine which components of speaking contributed most to the observed improvement, Table 2 summarizes the mean scores and gains for each assessed dimension pronunciation, fluency, accuracy, vocabulary, and comprehensibility based on the H. Douglas Brown (2012) Oral Proficiency Rubric.

Table 2. *Component wise comparison of experimental and control groups' pre- test and post-test scores*

Speaking Component	Group	Pre-test M (SD)	Post-test M (SD)	Mean Gain	t (df)	p value	Interpretation
Pronunciation	Experimental	14.3 (2.1)	17.9 (1.6)	+3.6	7.48 (34)	< .001	Significant
	Control	14.1 (2.3)	14.9 (2.0)	+0.8	1.62 (34)	> .05	NS
Fluency	Experimental	14.6 (2.4)	17.8 (1.8)	+3.2	6.85 (34)	< .001	Significant
	Control	14.4 (2.5)	15.2 (2.1)	+0.8	1.47 (34)	> .05	NS
Accuracy	Experimental	14.0 (2.0)	16.9 (1.7)	+2.9	6.12 (34)	< .001	Significant
	Control	13.9 (2.1)	14.8 (2.0)	+0.9	1.53 (34)	> .05	NS
Vocabulary Use	Experimental	14.7 (2.3)	17.6 (1.8)	+2.9	6.54 (34)	< .001	Significant
	Control	14.5 (2.2)	15.3 (1.9)	+0.8	1.41 (34)	> .05	NS
Comprehensibility	Experimental	15.0 (2.1)	17.7 (1.5)	+2.7	6.33 (34)	< .001	Significant
	Control	14.8 (2.3)	15.5 (2.0)	+0.7	1.38 (34)	> .05	NS

Note. Each component scored on a 20-point scale (five-point rubric × five categories). NS = Not significant.

The component wise data indicate that the greatest gains occurred in pronunciation and fluency, followed closely by accuracy and vocabulary use. Improvements in comprehensibility suggest that the combination of repeated interaction and immediate AI feedback enhanced learners' overall communicative clarity. The absence of significant change in the control group underscores the advantage of AI-assisted practice over traditional methods. These findings of the study revealed a clear and statistically significant improvement in students' English-speaking skills after the integration of Talkpal.AI in the learning process. Students demonstrated noticeable progress in fluency, vocabulary use, and pronunciation, supported by high engagement and

positive attitudes toward AI assisted speaking practice.

Qualitative results

The qualitative data collected through semi-structured interviews revealed rich insights into what challenges do students encounter when using Talkpal.AI for speaking practice in EFL classrooms. The qualitative strand of this study aimed to explore students' experiences, perceptions, and challenges in using Talkpal.AI as an AI-assisted speaking platform in vocational EFL learning contexts. Semi-structured interviews were conducted with 18 students at Teknik Kimia Industri. Thematic analysis of the transcripts revealed four dominant themes: (1) enhanced speaking confidence and reduced anxiety, (2) technological and procedural challenges, (3) perceived authenticity and human-likeness in AI interaction, and (4) contextual and pedagogical suggestions for vocational school. These themes collectively illustrate how AI-driven speaking tools reshape learners' engagement, affective states, and communicative competence within vocational education settings. The explanation four dominant themes as follow:

Enhanced Speaking Confidence and Reduced Anxiety: the most prominent theme across interviews was the boost in self-confidence and reduction of speaking anxiety when interacting with Talkpal.AI. Most students reported feeling more comfortable practicing with the AI compared to speaking with peers or teachers. They emphasized that the nonjudgmental environment of Talkpal.AI encouraged them to speak more spontaneously and frequently. As one student noted "I felt more comfortable and less nervous when speaking with Talkpal.AI because there's no fear of being judged (Student A)". Another student expressed that AI practice allowed her to take linguistic risks without embarrassment, "When I speak with the AI, I don't feel the same pressure as in class. Nobody laughs if I mispronounce. It makes me want to try again and talk longer (Student B)". These findings align with prior CALL research (e.g., Torkhani, 2025; Dikaprio & Dahlan Diem, 2024), indicating that AI-mediated speaking environments can effectively lower affective barriers and foster communicative confidence. Students also described increased fluency through habitual daily practice, reinforcing quantitative results that demonstrated significant gains in fluency and pronunciation scores.

Technological and Procedural Challenges: despite these positive perceptions, technological barriers emerged as a recurrent constraint. Several students mentioned unstable internet connectivity, speech-recognition inaccuracies, and limited access to premium features. These technical issues disrupted practice flow and sometimes caused frustration. For example: "One challenge I faced when using Talkpal.AI was unstable internet connection, and sometimes the AI didn't understand my pronunciation (student C). other students said "I use the basic version after ten minutes I can't continue. The premium version is too expensive for students (student D)". Others highlighted that inconsistent recognition of local accents occasionally reduced motivation: "When I speak with my accent, the AI sometimes gives a low score even though my teacher says it's fine (Student E)". Such limitations suggest that infrastructural readiness and model calibration remain critical to equitable AI integration in vocational EFL settings, especially in schools with restricted bandwidth or diverse regional pronunciations.

Perceived Authenticity and Human Likeness in AI Interaction: Students demonstrated divergent attitudes regarding the realism of AI-based communication. While some described the AI voice as "natural" and "like talking to a real person," others felt that the absence of emotional expression made the interaction less engaging. Student said "I feel the same as talking to a real person because the voice sounds natural (Student F)". another student also said "It helps me practice without feeling shy, but it feels less natural than talking to a real person (Student G". This ambivalence reveals that while AI effectively replicates linguistic exchange, it still lacks the paralinguistic cues and emotional reciprocity characteristic of human communication. Nonetheless, for many participants, the trade-off between emotional authenticity and psychological safety was acceptable, given the benefits in fluency and practice consistency.

Contextual and Pedagogical Suggestions for Vocational Relevance: A notable finding was students' awareness of contextual learning needs and their pedagogical suggestions to enhance Talkpal.AI's relevance for vocational programs. Many participants expressed the desire for task-based simulations aligned with workplace communication, such as customer service, job interviews, and technical vocabulary. Student G said "If Talkpal.AI provides topics related to our field, it will be easier for us to learn and use the right vocabulary". "Talkpal.AI should add more topics suitable for vocational students, such as job

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interview practice or workplace communication (Student H)". others students also emphasized the importance of integrating grammar and pronunciation feedback, progress tracking features, and longer free use duration to sustain engagement. These responses indicate that learners perceive AI not merely as a conversation partner but as a potential learning ecosystem that could align language development with their future professional needs. The depth of such meta pedagogical reflection underscores a growing learner autonomy fostered by regular interaction with adaptive technology.

Across these themes, the qualitative data strongly supported the quantitative evidence of improvement in pronunciation, fluency, and communicative confidence. Talkpal.AI was perceived as an accessible, non-threatening environment that promotes self-paced learning and immediate feedback critical factors for EFL learners with limited exposure to authentic English-speaking contexts. However, persistent infrastructural issues, affordability barriers, and occasional AI misrecognition highlight the necessity for institutional and technical support in sustaining AI-based pedagogy.

Overall, the interviews reveal that Talkpal.AI functions as both a linguistic tutor and an affective mediator, simultaneously improving language performance and reshaping learners' self-perceptions of communicative competence. These findings deepen the understanding of how AI can foster learner agency, emotional readiness, and task-based language development in vocational EFL education.

The analysis revealed notable improvements in the experimental group's overall speaking competence, supported by qualitative feedback highlighting greater learner engagement and confidence. Students described Talkpal.AI as an accessible, low anxiety platform that encouraged more spontaneous speaking and self-correction. These findings indicate that integrating AI-driven conversation tools effectively supports communicative growth beyond traditional classroom methods.

The findings of this study demonstrate that integrating Talkpal.AI into EFL instruction significantly enhances vocational high school students' English-speaking proficiency, particularly in fluency, pronunciation, and accuracy. The quantitative findings presented in Tables 1 and 2 provide compelling evidence that Talkpal.AI produced a statistically significant and practically meaningful improvement in vocational high school students' English-speaking performance. The experimental group demonstrated a large effect size (Cohen's $d = 1.45$) across pre- and post-test measures, confirming that sustained interaction with the AI-driven platform substantially enhanced learners' pronunciation, fluency, and overall communicative competence. Component-level analysis further revealed that the most pronounced gains occurred in pronunciation (+3.6) and fluency (+3.2), followed by accuracy, vocabulary use, and comprehensibility all showing $p < .001$. These multidimensional improvements indicate that Talkpal.AI effectively supports both linguistic precision and speech flow, two core indicators of oral proficiency. In contrast, the control group exhibited only marginal and statistically insignificant progress, underscoring the pedagogical advantage of AI-assisted practice over traditional classroom-based instruction. Collectively, these results substantiate the argument that generative AI tools can serve as transformative mediators in EFL pedagogy by offering adaptive feedback and autonomous rehearsal opportunities that directly translate into measurable performance gains. These gains align with previous studies (Dikaprio & Dahlan Diem, 2024; Efendi Hidayatullah, 2024; Torkhani, 2025), which highlight AI's effectiveness in promoting fluency and learner confidence.

Qualitative findings reinforced these outcomes by revealing students' increased motivation, self-confidence, and engagement when practicing with Talkpal.AI. Learners appreciated the platform's immediate feedback, flexible interaction, and anxiety-free environment, which encouraged more spontaneous speaking. However, challenges such as technical issues and limited internet access were also noted, underscoring infrastructural barriers in vocational settings.

Overall, the study confirms that Talkpal.AI provides a scalable and effective pedagogical tool for enhancing communicative competence in vocational EFL education (Çela et al., 2024; Hoang et al., 2023; Imron et al., 2024). It bridges the gap between classroom instruction and real-world communication demands, offering an adaptive, learner-centered approach that supports workplace readiness and 21st-century skills development among vocational students.

The results of this study align with and extend the findings of previous research on the effectiveness of AI-assisted language learning tools in improving EFL learners' speaking proficiency. Consistent with Torkhani (2025) and Efendi Hidayatullah (2024), this study found that

AI-driven applications significantly enhance fluency, pronunciation, and confidence through adaptive feedback and repeated interaction. Similarly, Dikaprio and Dahlan Diem (2024) reported that AI-supported learning environments expand learners' vocabulary and oral expression, which parallels this study's observation of improved vocabulary use and communicative readiness among vocational students using Talkpal.AI.

However, while most prior studies were conducted at the university level, this research extends the scope by examining AI integration in vocational high school settings, where students' communication needs are industry specific. Recent research highlights a growing trend of situating AI chatbots including platforms like Talkpal.AI within vocational education to address real world communication scenarios such as customer service and technical interactions. This contextual adaptation is seen as particularly relevant for skill based education, where authentic, workplace oriented language practice is essential (Hoang et al., 2023; Koç & Savaş, 2024).

A key difference also lies in learners' technological readiness. Previous studies often involved university students with high digital literacy, whereas this study revealed technical challenges and limited infrastructure among vocational learners' factors that moderated AI's effectiveness. Nevertheless, the qualitative findings mirror (Hoang et al., 2023) and (Gao et al., 2025), showing that despite such challenges, AI fosters learner autonomy, engagement, and motivation.

The findings of this study carry both theoretical and practical implications for EFL education, particularly in vocational high school contexts. Theoretically, the research reinforces the principles of Computer-Assisted Language Learning (CALL) and constructivist learning theory by demonstrating how AI-driven tools like Talkpal.AI can create interactive, learner-centered environments that promote autonomy, engagement, and authentic communication. The results validate the pedagogical potential of integrating artificial intelligence into task-based and communicative learning frameworks, suggesting that AI can serve as a dynamic co-teacher that personalizes feedback and scaffolds individual learning needs.

Practically, this study offers significant implications for English teachers, curriculum developers, and policymakers. For teachers, Talkpal.AI provides an effective supplementary tool to enhance speaking practice beyond classroom time, addressing common constraints such as large class sizes and limited speaking opportunities. Curriculum designers can integrate AI-assisted modules into vocational English programs to align language learning with industry specific communication skills, helping students prepare for real workplace interactions. For policymakers, the study highlights the importance of investing in digital infrastructure, teacher training, and AI literacy to ensure equitable access and effective implementation of emerging technologies in education.

Moreover, the positive outcomes observed suggest that AI tools can bridge the gap between traditional teaching limitations and the communicative demands of globalized industries. By incorporating AI-based conversational agents like Talkpal.AI, vocational institutions can better equip graduates with the linguistic confidence and fluency necessary to thrive in international work environments.

Despite yielding valuable insights, this study has several limitations that should be acknowledged. First, the research was conducted in a single vocational high school with a relatively small sample size, which may limit the generalizability of the findings to other educational contexts or regions. Second, the duration of the intervention six weeks may not have been sufficient to fully capture long term improvements or sustained motivation in students' speaking proficiency. Third, while the study employed pretest and posttests to measure quantitative gains, the assessment was limited to observable performance and did not explore deeper cognitive or affective changes in learners. In addition, qualitative data were gathered through self-reported interviews, which might introduce bias due to students' desire to give favorable responses. Technical issues, such as inconsistent internet connectivity and varying levels of digital literacy, may also have affected the students' learning experience with Talkpal.AI. Future studies should involve larger and more diverse samples, longer treatment periods, and triangulated instruments including classroom observations and teacher reflections to obtain a more comprehensive understanding of AI-assisted speaking development in vocational EFL contexts.

CONCLUSION

This study aimed to investigate the impact of Talkpal.AI on improving vocational high school students' English-speaking skills specifically

fluency, accuracy, and communicative confidence within EFL learning contexts. It also sought to identify the challenges students face when integrating Talkpal.AI into their speaking practice, particularly in aligning their language use with industry specific communication needs relevant to vocational education.

The study revealed that Talkpal.AI significantly improved students' English-speaking proficiency, with the experimental group showing a large and statistically significant gain in fluency, pronunciation, and accuracy compared to the control group ($p < .001$, Cohen's $d = 1.45$). Students also reported increased confidence, motivation, and engagement when practicing with AI due to its instant feedback and low-anxiety environment. However, technical challenges such as limited internet access and unfamiliarity with the platform were noted. Overall, Talkpal.AI proved effective in enhancing vocational EFL learners' communicative competence and workplace readiness.

The findings suggest that Talkpal.AI can be a transformative tool in vocational EFL education, bridging the gap between classroom learning and real-world communication needs. By offering personalized, interactive speaking practice, it supports teachers in overcoming time and resource limitations while enhancing students' employability and global readiness. These results highlight the need for AI integration in vocational curricula and greater investment in digital infrastructure and teacher training to maximize its educational impact.

This study was limited by its small sample size, short intervention period, and single-school setting, which may restrict the generalizability of the findings.

Future research should involve larger and more diverse samples across multiple vocational schools to enhance generalizability. Longer intervention periods and longitudinal studies are recommended to examine the sustained effects of AI-assisted learning. Additionally, integrating teacher observations and AI analytics could provide deeper insights into learner behavior, engagement patterns, and the long-term impact of Talkpal.AI on speaking proficiency and confidence.

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