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Research Article

Enhancing Students' Speaking Proficiency through Project-Based Learning and AI-Supported Tools (Orai App)

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Abstract
This study examines the effectiveness of integrating Project-Based Learning (PBL) with AI-supported tools, specifically the Orai application, to enhance students' English-speaking proficiency. Conducted as a Classroom Action Research (CAR), the study involved two cycles, each including pre-tests and post-tests, assessed using the Speaking Rubric proposed by O'Malley and Pierce (1990). The participants were 25 first-semester students from the MICE (Meetings, Incentives, Conventions, and Exhibitions) study program enrolled in the English 1 course at the Business Administration Department of Politeknik Negeri Medan during the 2025/2026 academic year. This study used a mixed-methods approach, combining quantitative and qualitative data to provide a comprehensive analysis of the intervention. The quantitative data revealed significant improvements in students' speaking proficiency. The pre-test mean score was 75.28, and by the post-test, the average score had increased to 86.00, reflecting a 10.72-point improvement. Additionally, Cycle 1 indicates an average increase of 5.96 points (from 75.28 to 81.24), while Cycle 2 shows a further 2.6-point improvement (from 81.24 to 83.84). This demonstrates a consistent upward trend in students' speaking skills throughout the intervention. Meanwhile, qualitative data further supports these findings, highlighting increased confidence, engagement, and active participation among students, particularly in real-world tasks related to tourism and hospitality. However, the intervention also revealed areas for further refinement. There is a need for more personalized support from instructors to address individual learning challenges, and a wider range of topics to cater to students' diverse interests and career aspirations. The integration of AI tools supported students in practicing individually and fostered greater confidence and more active engagement in collaborative projects. The results suggest that applying PBL with AI-assisted applications is an effective instructional strategy to address speaking challenges in English language learning at the tertiary level.

Keywords
project-based learning (PBL), AI-supported tool, English speaking proficiency, classroom action

research (CAR), vocational education

Introduction

In the era of globalization and the Fourth Industrial Revolution, English proficiency is increasingly recognized not merely as a supplementary skill but as a core competency essential for workforce readiness, particularly among graduates of vocational education. It is reported that more than 1.75 billion people worldwide use English for communication, a figure that continues to grow as English consolidates its position as the dominant language of international business, technology, diplomacy, and cross-border exchange (Zeng J, et al., 2023). Similarly, Graddol (2006) notes that the global demand for English proficiency will intensify alongside the expansion of digital economies, international labor mobility, and the growth of the service and tourism industries. Moreover, the World Economic Forum (2020) report identifies communication skills, particularly foreign-language competence, among the top 10 essential skills for the future workforce. In line with this, the EF English Proficiency Index (2023) ranks Indonesia 79th out of 113 countries in the "low proficiency" category. This issue is further compounded by findings from Palayukan, N., Asnur, et al. (2025), which reveal that some students, especially at Polytechnics, still face linguistic barriers due to substandard English proficiency, low confidence, and difficulties with real-world communication. These findings underscore the urgent need for higher education institutions, including Politeknik Negeri Medan, to strengthen their initiatives in improving students' English proficiency through innovative, technology-enhanced, and contextually relevant learning approaches. This need is particularly critical for students majoring in the Meetings, Incentives, Conventions, and Exhibitions (MICE) at the Business Administration study program, whose career paths are closely tied to the hotel, tourism, and hospitality industries. As future professionals in these globalized sectors, MICE graduates are required to develop strong English communication skills to interact effectively with international clients, partners, and diverse multicultural environments.

In addition, Politeknik Negeri Medan has adopted the TOEIC test as a standardized measure of language proficiency. However, data collected from students and pre-alumni in the Business Administration Department indicates that many still demonstrate low English proficiency. Among pre-alumni, 52% scored between 200–299, 25% scored between 300–399, and only 14% scored above 400, the minimum threshold for basic professional communication. Unfortunately, 10% scored between 100 and 199, and 4% scored between 10 and 99. These results highlight that a significant portion of students have not attained the English proficiency level required by industry standards (Elviani, 2024). Consequently, this underscores the need for higher education institutions to adopt innovative, technology-enhanced instructional methods to improve students' speaking abilities, especially in real-world professional settings. Moreover, traditional English instruction in Polytechnics still relies heavily on grammar-translation methods, repetitive drills, and teacher-centered approaches, which offer limited opportunities for students to practice speaking in authentic contexts. As a result, many students remain passive, lack confidence, and are reluctant to use English both in and out of the classroom. Research by Ariani (2020), Jannah, D. M., & Hasbaini (2024), and others supports this concern, as students have reported significant difficulties with pronunciation and anxiety during group presentations, often due to inadequate grammar, vocabulary, and self-confidence.

Addressing these challenges requires a transformation in English language teaching, particularly for speaking skills. The present study, titled "Enhancing Students' Speaking Proficiency through Project-Based Learning and AI-Supported Tools", proposes an innovative framework that integrates Project-Based Learning (PBL) with AI-powered speaking tools, such as the Orai app. Halimah, Lustyantie, and Ibrahim (2018) described Orai as an application designed to help individuals improve their speaking skills by acting as a mirror to provide real-time feedback. The app identifies filler words, adjusts the pace of speech, and evaluates energy levels, allowing users to refine their speaking abilities through continuous, self-directed practice. By integrating Orai into Project-Based Learning (PBL), students

benefit from a dynamic learning environment that combines the strengths of both approaches. PBL creates an immersive, project-oriented atmosphere where tasks are meaningful and directly relevant to real-world contexts. In this integrated framework, PBL encourages students to actively participate in group tasks like creating speaking presentations or role-plays, which provide natural opportunities to practice and improve their speaking skills. As Thomas (2000) highlighted, PBL promotes active engagement and collaboration, offering students authentic, performance-based experiences that enhance both their fluency and confidence in speaking. This approach empowers students to take ownership of their learning, using the Orai app as a personalized tool to continuously improve their speaking proficiency throughout the project cycle.

A growing body of research has examined the application of Project-Based Learning (PBL) and the integration of digital technologies to improve English as a Foreign Language (EFL) speaking skills. Benlaghrissi and Ouahidi (2024) explored the impact of Mobile-Assisted PBL (M-PBL) through an experimental design involving three groups: M-PBL, PBL without mobile support, and conventional instruction. Their findings revealed that the M-PBL group significantly outperformed the others in fluency, coherence, vocabulary, grammar, and pronunciation ($p < 0.05$). Nevertheless, their study was limited to mobile technology and did not incorporate artificial intelligence (AI) tools that provide automated feedback and deeper analysis of speaking performance. This highlights the need for further research into AI-enhanced PBL.

In a similar context, Hoensy et al. (2024) conducted a quasi-experimental study integrating digital technology into PBL using video recorders, speech training applications, and online presentation platforms. The results demonstrated significant improvements in fluency, confidence, and pronunciation. However, the applicability of these findings was limited, as they could not be generalized to other institutions with varying student demographics, learning cultures, or technological infrastructures. Building on this, the present study at Politeknik Negeri Medan seeks to expand the scope by incorporating AI-powered applications that deliver real-time feedback and personalized support.
Additionally, Huang and Sun (2022) contributed a broader perspective through a review of prior studies on PBL in speaking instruction. Their synthesis confirmed that PBL enhances all four IELTS speaking criteria, fluency and coherence, lexical resource, grammatical range and accuracy, and pronunciation, with particularly strong improvements in fluency and vocabulary. Although this review supports the effectiveness of PBL, it was not based on primary classroom data and did not consider the role of AI in speaking instruction, an area of growing innovation. Moreover, research in the Indonesian context further demonstrates the value of PBL. Nurrahma et al. (2023) implemented Classroom Action Research (CAR) using simulation as a PBL activity in a Business English course. Their study reported a notable increase in students' average speaking scores, from 58.23 to 67.65, alongside positive student perceptions that simulations boosted motivation and made learning more meaningful. However, reliance on conventional simulations without technological integration leaves room for innovation through AI-based speech tools.

Another CAR study was conducted by Ariani, Hidayat, and Girikallo (2023), who examined the implementation of PBL within a blended learning environment for polytechnic students. Their findings indicated a significant improvement in speaking scores, rising from 58.7 in the pre-cycle to 70.1 in the post-cycle, along with enhanced student participation, creativity, and positive attitudes. Despite these outcomes, the study did not integrate AI technologies, highlighting a gap for future research. In summary, existing studies consistently show that PBL is an effective method for improving EFL speaking performance by fostering active communication, collaboration, and learner engagement. Nonetheless, most of the previous research has been limited either to conventional PBL practices or to mobile and digital tools that lack AI-driven feedback mechanisms. Therefore, the present study distinguishes itself by integrating PBL with AI-based speaking tools, particularly Orai, in the context of vocational higher education at Politeknik Negeri Medan. This integration is expected to provide more immediate, personalized, and effective support for students in developing their speaking proficiency.

Method

Study Design

This research employed a mixed-methods design, combining quantitative data from Classroom Action Research (CAR) with qualitative data collected via questionnaires. Following Burns (2010) guidelines, the research process began with identifying the research topic, formulating the research problem, reviewing relevant literature, selecting the research design, choosing appropriate methods, detailing data analysis techniques, and reporting the findings.

Sample Population

This study was conducted during the first semester of the 2025/2026 academic year in an English 1 class at Politeknik Negeri Medan. It involved 25 students from the MICE study program, aged 19-20, all of whom were learning English as a Foreign Language (EFL). Participants were selected using purposeful sampling, a method that allows researchers to explore a phenomenon in sufficient depth with a manageable number of participants (Patton, 2022). A small sample size is deemed appropriate when participants have relevant knowledge and experience within the area of inquiry, as this enables them to offer rich and meaningful insights (Guest, 2006). Given the limited number of participants, however, the findings of this study are not intended to be broadly generalizable (Cohen et al., 2018). It is also important to note that the participants represented three distinct levels of English proficiency: low, medium, and high performance. These proficiency levels were determined based on their average classroom performance, as reflected in their scores on general English tests. Despite the differences in ability, this diversity was not considered a barrier to the research. On the contrary, it provided a broader view of student experiences and engagement levels. Additionally, it is important to acknowledge that the research was conducted by the authors, who also served as lecturers for this English class. Given their dual roles, a convenience sampling method was employed, prioritizing the practicality and feasibility of conducting research within their immediate teaching environment.

Data Collection Techniques and Research Instrument

The data for this research were collected from both primary and secondary sources. The primary data consisted of students' learning outcomes, derived from their assessments of speaking skills related to hotel, tourism, and hospitality topics. Secondary data, on the other hand, was gathered through observations made by observers during the learning process in both the first and second cycles. Quantitative data were collected from students' speaking test scores/results administered after the first and second cycles. The research included four types of data: (1) data on students' initial speaking skills on hotel, tourism, and hospitality material (pre-test); (2) data from the first cycle of speaking skills-related material (cycle 1); (3) data from the second cycle of speaking skills.

Meanwhile, to obtain qualitative data on students' perceptions and experiences, a questionnaire was administered through Google Forms. The questionnaire consisted of five open-ended questions, each designed to encourage students to express their opinions, reflections, and evaluations in their own words. The questions explored various aspects of their learning experience, including what they liked most about learning through PBL and Orai, the challenges they encountered during project implementation or when using the application, and their overall impressions of the English-speaking improvement class. Additional items invited students to provide suggestions for improving the learning method and to self-assess their progress in speaking skills by estimating their percentage of improvement after participating in the course.

The study employed Classroom Action Research across two cycles to assess the effectiveness of Project-Based Learning (PBL) integrated with the Orai application in improving students' speaking proficiency. Each cycle followed four stages: identification and planning, action implementation, observation and data collection, and reflection and evaluation. The first stage involved identifying speaking challenges, such as pronunciation, grammar, vocabulary, fluency, and interactive communication. Then, a lesson

plan incorporating PBL tasks on tourism and hospitality topics was developed for individual practice. The chosen topic was relevant to the students' academic needs and aligned with the current syllabus. The second stage involved implementing the action, during which students were introduced to the PBL tasks and trained to use the Orai application. Working in groups of four, students prepared dialogues and role-plays on tourism and hospitality topics while practicing individually using Orai to improve pronunciation, fluency, and delivery. The lecturers acted as facilitators, monitoring group progress, providing guidance, and encouraging students to use Orai feedback to enhance their performance. In the third stage, observation and data collection were conducted to assess student progress. A pre-test was administered before the intervention, where students participated in a dialogue on tourism and hospitality topics, providing a baseline of their speaking proficiency. Following the intervention, a post-test in the form of a role play was conducted to assess improvements. Both the pre- and post-tests were recorded and evaluated using the Speaking Rubric by O'Malley and Pierce (1990), with adjustments made based on the framework proposed by Sari, A. S. P., & Sembiring, R. K. (2019), which focuses on pronunciation, grammar, vocabulary, fluency, and comprehension. To complement these assessments, classroom observations were conducted to monitor student participation, engagement, and collaboration. Additionally, Orai usage logs and student feedback from questionnaires were collected to provide a comprehensive understanding of student development. Students were briefed on the evaluation rubric, which guided both their individual and group performances throughout the study. In the final stage, reflection and evaluation were conducted collaboratively with a colleague to analyze pre- and post-test results, classroom observations, Orai reports, and student feedback. This analysis informed adjustments for the second cycle, including modifications to scaffolding levels and increased practice time. The second cycle followed the same structure, but incorporated revisions based on insights gained from the findings of the first cycle.

Data Analysis Techniques

Quantitative Analysis

For the quantitative analysis, the primary focus was on students' speaking test scores, which were collected at two points: the pre-test (administered before the intervention) and the post-test (administered after completing the PBL tasks using Orai). The mean scores for each cycle were calculated to provide an overview of the students' performance improvements over time. The pre-test scores served as the baseline, and the post-test scores allowed for a comparison of the progress made after the intervention. Descriptive analysis, including the calculation of mean scores, was conducted to illustrate the changes in students' speaking proficiency in areas such as pronunciation, grammar, vocabulary, fluency, and comprehension. These results were then interpreted to assess the overall impact of the PBL approach integrated with Orai on the students' speaking skills. The comparison of these scores enabled the researchers to identify observable trends and patterns in the students' development from the first cycle to the second cycle.

Qualitative Analysis

Meanwhile, the qualitative analysis involved collecting data from student questionnaires distributed via Google Forms, classroom observations, and feedback from Orai application usage logs. The questionnaire, which consisted of five sections, aimed to capture students' perceptions and experiences of the intervention, specifically their engagement with the PBL tasks and the Orai app. Responses from the questionnaires were analyzed using thematic analysis (Braun & Clarke, 2006) to identify recurring themes related to students' experiences, challenges, and perceptions of the intervention. This approach enabled the researcher to organize and interpret qualitative data systematically, highlighting key patterns that complemented the quantitative findings (Creswell & Poth, 2018). Additionally, classroom observations were used to gather insights on student participation, collaboration, and engagement during the PBL activities. The data from the Orai usage logs were examined to monitor students' interaction with the app, tracking how often they used it and which areas of speaking they focused on improving.

Results and Discussion

The analysis combined both quantitative and qualitative data to provide a comprehensive understanding of the intervention's impact. Quantitative data from students' test scores across the pre-test, cycle 1, cycle 2, and post-test stages indicate measurable improvement in speaking performance. Qualitative data collected through observations and questionnaires provided deeper insights into students' perceptions, attitudes, and learning experiences during the intervention. The following sections present a detailed discussion of these findings, integrating quantitative outcomes and qualitative insights to provide a holistic interpretation of the research results.

Quantitative Report

Comprehensive Assessment of Students' Speaking Proficiency

The overall analysis of students' speaking proficiency indicates progressive improvement across all phases of the intervention. Starting with the Pre-test, which served as the baseline measure of students' speaking abilities. The following table provides a descriptive statistics overview of the students' Pre-test, Cycle 1, Cycle 2, and Post-test scores.

Table 1. Descriptive statistics overview of students' speaking proficiency

	N (Count)	Mean	SD
Pre-test	25	75.28	4.77
Cycle 1	25	81.24	5.54
Cycle 2	25	83.84	4.82
Post-test	25	86.00	6.80

To further illustrate these findings, the following line graph provides a visual representation of the mean scores across the different phases. This graph reinforces the quantitative data in the table, clearly showing the progressive improvement in students' speaking proficiency. As the graph demonstrates, the mean scores steadily increased over time, highlighting the effectiveness of the intervention.

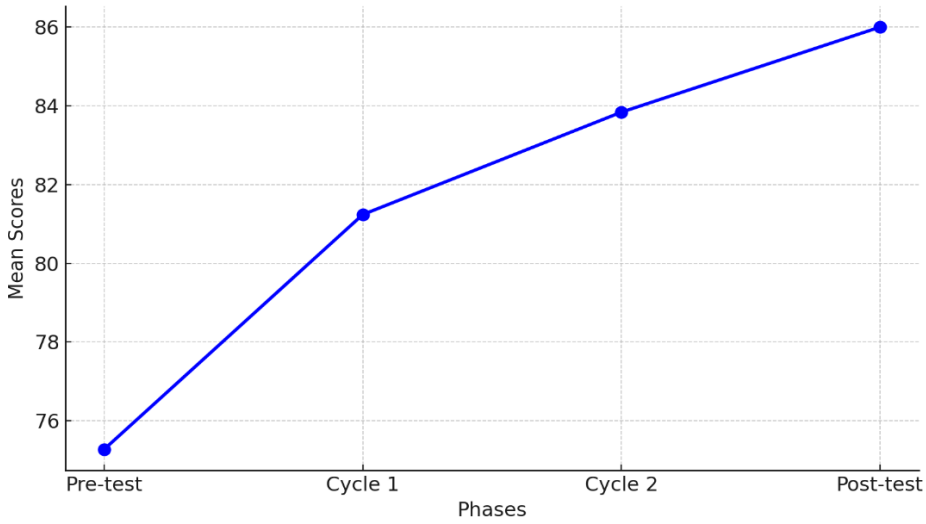

Figure 1. Students' speaking proficiency across different phases

A significant increase in scores was observed by the Post-test, with students showing an average improvement of 10.72 points. This improvement suggests that the intervention may have contributed to enhancing students' ability to communicate in English. Additionally, the progression observed between Cycle 1 and Cycle 2, with an average improvement of 2.6 points, highlights a consistent upward trend in students' speaking performance. Notably, the increase from the pre-test to Cycle 1, where students improved by an average of 5.96 points, indicates that the intervention's initial phase had a positive influence, laying a foundation for further progress in the subsequent cycle. These findings collectively show that students' speaking proficiency improved and increased steadily, reflecting the cumulative

benefits of continuous learning and feedback. The integration of both Project-Based Learning (PBL) and AI-supported tools appears to have supported this sustained improvement, contributing to students' growing confidence and competence in English speaking.

The mean score increased consistently across all phases. From the Pre-test (75.28), students' average scores improved to 81.24 in cycle 1, 83.84 in cycle 2, and reached 86.00 in the post-test. This indicates a steady improvement in students' speaking proficiency throughout the intervention phases, reflecting the overall success of the teaching strategy. Moreover, the standard deviation shows the spread of students' scores around the mean. The pre-test has a relatively low standard deviation (4.77), suggesting that students' scores were clustered around the mean at the start of the intervention. The standard deviation increased in Cycle 1 (5.54) and Cycle 2 (4.82), indicating that, while most students continued to improve, their performance became more variable as the intervention progressed. The higher post-test standard deviation (6.80) suggests a wider spread of scores, indicating that students' final performance after the intervention showed greater individual differences.

Also, the minimum score increased from 65 in the Pre-test to 70 in the Post-test, indicating that even the lowest-performing students improved. The maximum score also increased from 85 in the Pre-test to 95 in the Post-test, indicating that the highest-performing students maintained or further enhanced their proficiency. Additionally, the 25th percentile (Q1) and 75th percentile (Q3) show a clear upward trend in scores. For instance, at the Pre-test, the 25th percentile was 72, and the 75th percentile was 78, while at the Post-test, the 25th percentile increased to 85, and the 75th percentile to 90. This indicates that a larger portion of students moved into higher score brackets by the end of the intervention. Furthermore, the median scores (50th percentile) also show a steady increase. The median shifted from 76 in the Pre-test to 88 in the Post-test, further demonstrating the intervention's effectiveness in improving students' speaking skills across the entire class.

Cycle-Based Progression

The cycle-based structure of the intervention helped students improve their speaking skills step by step, with each phase allowing for gradual progress, reflection, and refinement. The progression from the Pre-test to Cycle 1, and subsequently from Cycle 1 to Cycle 2, demonstrates the systematic enhancement of students' speaking proficiency. Between the pre-test and Cycle 1, the average score increased by 5.96 points, indicating a significant initial improvement. This phase likely represented the students' first exposure to the intervention strategies, including Project-Based Learning (PBL) and AI-supported tools such as Orai. In this cycle, students focused on developing foundational speaking skills, including fluency, pronunciation, and confidence. The relatively greater improvement in this phase suggests that the initial intervention had a profound impact on students, equipping them with the necessary skills and motivation to sustain their progress.

The transition from Cycle 1 to Cycle 2 also showed an improvement of 2.6 points, though the rate of progress was lower than in the previous phase. This indicates that, as students approached higher levels of proficiency, further improvements required more targeted and refined practice. The smaller gain in Cycle 2 reflects the complexity of mastering advanced aspects of speaking, such as pacing, clarity, and vocal energy. Despite the reduced rate of improvement, the continued progress in this cycle underscores the effectiveness of sustained practice and iterative feedback, as students were able to continuously refine their skills through real-time corrections provided by the AI tool. Overall, the cycle-based design allowed students to progressively build their speaking skills, with each phase offering opportunities for reflection and skill development. The combination of PBL and AI tools ensured a comprehensive and adaptive learning experience, fostering both immediate improvements and long-term mastery of speaking skills.

Reduced Variation (Consistency in Performance)

The reduced variation in student performance, especially between Cycle 1 and Cycle 2, suggests that the

intervention played a key role in increasing consistency across the students' speaking proficiency. Initially, in the Pre-test, there was a noticeable range in students' performance, with some students demonstrating significantly lower proficiency and others already performing at a higher level. However, by the end of the intervention, particularly in Cycle 2, the performance gap was much narrower, indicating that all students had made meaningful progress, regardless of their starting point. This shift toward more uniform performance is an important outcome, as it implies that the intervention not only benefited students as a whole but also helped level the playing field among learners with different initial levels of proficiency.

One possible explanation for this increased consistency is the repetitive nature of the intervention, which gave students multiple opportunities to engage with the material, practice speaking, and receive feedback. Repetition is a core principle of effective language learning, particularly when combined with reflective practice. In each cycle, students had the opportunity to assess their own progress, identify areas for improvement, and adjust their speaking performance. This iterative process allowed students to gradually refine their skills, reducing inconsistencies in their performance over time.

Furthermore, the immediacy of Orai's feedback meant students were not left to rely on delayed or general feedback, which can sometimes lead learners to continue practicing mistakes without corrective intervention. Instead, the real-time aspect of the feedback allowed students to immediately recognize and address mistakes, fostering a more continuous learning experience. This frequent correction and the ability to regularly engage with their speaking performance allowed students to make small but consistent improvements that accumulated over time, contributing to the narrowing of the performance gap.

Finally, the reduced variation in performance also suggests that the intervention was effective across different proficiency levels. While students initially varied in competence, the data indicate that the intervention enabled students at all levels; low, middle, and high to make substantial gains. This further highlights the intervention's adaptability, as it catered to students' diverse needs. The combination of PBL and AI feedback ensured that all students had the resources and support they needed to improve their speaking proficiency at their own pace, reducing performance variability by the end of the intervention.

Implications Across Different Student Achievement Levels

Lower-achieving students initially demonstrated pre-test scores ranging from 55 to 69, reflecting significant challenges in areas such as pronunciation, fluency, and grammar. However, these students showed moderate improvement in Cycle 1, where their scores moved into the medium-achieving range (70-79). Despite this progress, their results in Cycle 2 and the post-test remained relatively stagnant, with scores ranging from 70 to 75, indicating that while they benefitted from the intervention, their overall proficiency level continued to lag behind their peers. This slower progress suggests that these students would require additional support, more practice sessions, and more personalized feedback to reach higher proficiency levels.

Meanwhile, the medium-achieving students showed a stronger baseline, with pre-test scores typically between 70 and 85. These students demonstrated significant progress across all cycles, with their Cycle 1 scores reflecting a shift toward the higher-achieving range. In Cycle 2, their scores continued to improve, generally falling between 80 and 85, and by the post-test, most of these students reached scores above 85, indicating a marked improvement in their speaking proficiency. The Orai app and PBL activities were especially beneficial for this group, offering them the structure and resources they needed to fine-tune their skills and advance to a higher level of speaking proficiency.

Lastly, Higher-Achieving Students began with a strong foundation, scoring 85 or above in the pre-test. While their scores did not see dramatic increases compared to the other groups, they did show

incremental improvements in fluency and vocabulary, moving from 88 in Cycle 1 to 90-95 in the post-test. The improvements in these students, though less pronounced, were still significant, particularly in pronunciation and advanced vocabulary. These students were already proficient in speaking, and the interventions further refined their skills, particularly in areas such as coherence and spontaneity during speaking tasks. These students excelled with the feedback from Orai, which allowed them to hone their advanced skills and maintain their high performance.

Qualitative Overview to Support the Above Results

The qualitative data collected from the participants provide valuable insights into the effectiveness of Project-Based Learning (PBL) combined with the Orai app in improving students' speaking proficiency. After conducting a thorough thematic analysis, the following key themes emerged from the responses.

The Integration of PBL and AI Tools Increases Confidence and Engagement

A key theme across both the qualitative feedback was the increase in confidence in speaking. Many students reported that the group-based learning activities provided by Project-Based Learning (PBL) allowed them to speak without fear of judgment. This significantly boosted their self-confidence. The collected responses showed that PBL activities and Orai made learning more interesting, interactive, and enjoyable. Several students reported that Orai helped them identify areas for improvement, such as pronunciation, intonation, and fluency. For example, one student stated, *"Yes, because I enjoy English, exactly, because I feel there has been progress, and that makes me want to study even harder. I feel more motivated to keep improving my speaking skills after taking this class."* This statement shows students' greater enthusiasm and willingness to improve their English-speaking skills. This finding aligns with the results of Kuswahyuningsih et al. (2023), who reported that students in PBL became increasingly involved and confident over time. The integration of Orai, which provides personalized feedback on pronunciation, fluency, and grammar, was key in boosting performance. Similarly, Halimah et al. (2018) emphasized that AI tools like Orai build self-confidence through practice and real-time feedback. These tools encouraged even shy learners to participate more in speaking tasks.

The Role of AI in Enhancing Speaking Proficiency through Immediate Feedback

The Orai app was identified as a key factor in enhancing students' speaking skills. The real-time feedback it provides helped students identify filler words, monitor their speaking pace, and improve pronunciation, areas that were frequently cited as challenges by students (Sutami, 2020). One student shared, *"The use of the Orai app helped me improve my speaking skills, especially my pronunciation and intonation. Additionally, I can now practice on my own anytime without having to wait for a class."* This highlights how students valued the instant, personalized feedback from the app, which enabled self-correction and encouraged independent learning. By integrating Orai into Project-Based Learning (PBL), students not only benefited from a student-centered approach but also received personalized support that helped them develop their language skills effectively. Additionally, studies by Yuliansyah and Ayu (2021) and Chatwattana and Nilsook (2017) found that incorporating AI into PBL significantly increased student engagement by offering real-time, tailored feedback. This boosted students' motivation to take a more active role in their learning, fostering an interactive, learner-centered environment that promotes self-directed learning. In line with these findings, Deliza and Sadikin (2023) reported that students felt more comfortable with speaking tasks due to the instant feedback they received from Orai, enabling them to correct mistakes independently and thereby support self-directed learning. Thus, by integrating AI, applications like Orai can provide immediate, actionable feedback on students' speaking, helping bridge the gap between classroom instruction and real-world application (Ali, N., & Losi, R. V., 2025). Additionally, the personalized nature of AI-driven feedback helps address the issue of low learner confidence, as students can practice at their own pace and focus on specific areas of improvement without fear of judgment from peers or instructors (Tridinanti, 2018). Thus, it can be said that this personalized learning experience empowers students to take ownership of their progress, leading to greater motivation and improvement in their speaking skills.

Project-Based Learning (PBL) has Collaborative Nature to Enhance Student Engagement and Learning

This theme reflects the key ideas that focus on the collaborative aspect of PBL, enhancing student engagement, interaction, and learning. It also highlights the benefits of peer learning and the practical application of language skills, particularly in the context of group-based activities and speaking tasks. Research by Mustamin et al. (2024) highlights the positive impact of PBL on students' collaborative abilities, particularly in areas such as communication, teamwork, and problem-solving. Regarding this, several students shared their positive experiences. One student stated, *"We can learn from each other through active discussions," and "I really enjoy it because I can collaborate with the team",* In a similar context, another student added, *"if someone doesn't know something, someone else will teach, and we can help each other."* These reflections highlighted the benefits of working collaboratively, where students support one another and grow together in their language learning journey. Similarly, the study by Halimah et al. (2018) found that students who actively engaged in PBL demonstrated a way to enhance collaborative learning, as students worked in groups to develop speaking tasks, thereby fostering a community of practice. However, this approach requires effective time management strategies and teachers' capacity to serve as facilitators, ensuring that students can work together efficiently to achieve their goals. Students who actively engage in PBL benefit from enhanced collaborative learning, as they work in groups to develop and refine their speaking tasks, thereby creating a community of practice (Hidayati, Siahaan, Andriani, & Putri, 2023).

Challenges and Areas for Improvement

Despite receiving overall positive feedback, several students highlighted areas where the Orai app could be more effective. A recurring challenge reported by students was the limitation of Orai's access, particularly the subscription requirement. Many students struggled to access the full features of the app once the free trial ended, which hindered their ability to practice consistently. In addition to these challenges, technical issues such as internet connectivity and application performance were frequently mentioned. Students noted problems like *"slow signal", "the app is a bit slow"*, and "*difficulty understanding the initial usage".* These technical glitches disrupted speaking practice and reduced the effectiveness of Orai's real-time feedback feature. Another common theme was the limited vocabulary and language mastery that many students faced, which impeded their ability to speak fluently during tasks. Responses such as *"lack of vocabulary"* and *"when I want to say something but don't have enough vocabulary"* illustrate the difficulty students experienced in expressing themselves effectively and translating their ideas into English. While Orai proved to be a helpful tool, many students felt that additional practice and personalized instructor feedback were essential for improving its effectiveness. Students who were less familiar with the technology found it challenging to fully utilize the app, which sometimes hindered their progress. This aligns with Sutami (2020), who noted that while Orai is a valuable resource, it cannot fully replace the benefits of face-to-face interaction and instructor-led guidance. Additionally, students suggested incorporating a variety of tasks beyond the initial speaking exercises, such as role-playing and interactive discussions, which they believed would further enhance their speaking skills in more dynamic and real-world contexts. Finally, a few students pointed out psychological barriers, including nervousness and a lack of confidence when speaking in English. One student reflected, *"nervousness and lack of confidence when speaking in English..." but with repeated practice, I became calmer and more confident."* This highlights the emotional challenges students face when speaking a foreign language, which can be alleviated over time with consistent practice and feedback.

Conclusion

The integration of Project-Based Learning (PBL) and the Orai app has proven to be an effective approach for enhancing students' speaking proficiency. Both quantitative and qualitative data indicate significant improvements in students' ability to communicate in English, which reflect the cumulative advantages of continuous learning and feedback. The quantitative data showed a consistent and quantifiable

improvement in students' speaking performance across multiple cycles of the intervention. From the pre-test to the post-test, students demonstrated an average improvement of 10.72 points, with a marked increase in their speaking proficiency. The cycle-based progression revealed consistent upward trends in scores, highlighting the importance of sustained practice and iterative feedback in fostering long-term language acquisition. Moreover, even the lower-achieving students showed notable progress, indicating the inclusivity of the intervention, which effectively supported learners at various proficiency levels. The qualitative data revealed positive student perceptions of the intervention, with students particularly appreciating the collaborative nature of PBL and the instant, personalized feedback provided by the Orai app. Students reported feeling more confident and motivated, as they were able to practice independently while receiving immediate corrections. This feedback was instrumental in addressing issues such as pronunciation, intonation, and fluency, which students commonly cited as challenges. Moreover, the use of PBL facilitated peer learning and provided a platform for active participation, further enhancing students' engagement and confidence in their speaking abilities. However, some challenges remain, particularly the subscription-based limitations of Orai, which hinder continuous access to advanced features after the free trial ends. Additionally, technical issues, such as connectivity problems and app performance glitches, occasionally disrupted students' practice sessions. Furthermore, issues such as limited vocabulary and psychological barriers, including nervousness and a lack of confidence, were also reported by students, indicating the need for ongoing support and targeted interventions to address these aspects of language learning. Overall, the combination of PBL and AI-supported tools, such as Orai, has proven to be a powerful method for improving students' English-speaking proficiency. The findings suggest that, with the continued integration of these tools and the addressing of existing challenges, students can further enhance their speaking skills, particularly through personalized learning experiences and ongoing practice.

Recommendations

Based on the findings of this study, several recommendations can be made to enhance the effectiveness of the intervention and further improve students' speaking proficiency. First, it is essential to increase personalized feedback from instructors. While the Orai app provided valuable automated feedback, students expressed the need for more tailored guidance that could address their specific challenges in speaking. Instructors could incorporate more individualized assessments and face-to-face feedback sessions to provide deeper insights and facilitate targeted improvement. Second**,** expanding the variety of speaking topics and tasks would be beneficial. While the current study focused on tasks related to tourism and hospitality, incorporating a broader range of activities such as role-plays, and interactive discussions, would further enhance students' fluency and ability to apply their speaking skills in dynamic, real-world contexts. These diverse tasks would not only make the learning process more engaging but also ensure that students are better prepared for various speaking scenarios they may encounter in professional settings. Third, to support students who may have limited experience with technology, it is crucial to provide additional training and support on how to effectively use AI tools like Orai. Offering tutorial sessions, guided practice, and peer support systems could help build students' confidence and competence in using digital tools for language learning, ensuring that all students, regardless of their technological background, can fully benefit from the intervention. Finally, future research should consider assessing the long-term impact of the PBL and AI integration on students' speaking proficiency. Understanding how well students retain and apply their speaking skills over time will provide valuable insights into the sustainability of the improvements observed in this study. Additionally**,** expanding the sample size and incorporating students from various academic programs and institutions would help assess the broader applicability of this instructional approach, making the findings more generalizable and impactful. By addressing these suggestions, future iterations of this intervention could ensure even greater success in improving students' speaking proficiency and preparing them for the communication demands of their future careers.

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