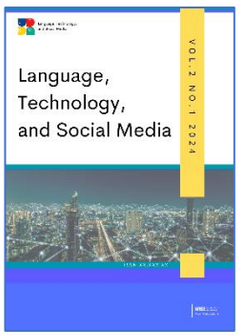

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Research Article

How Effective is Talkpal.ai in Enhancing English Proficiency? Insights from an Experimental Study

Vigo Dikaprio* and Chuzaimah Dahlan Diem

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Abstract

Mastering English speaking skills is an essential competency for students of the English Education Study Program, particularly in facing the challenges of globalization. With the advancement of technology, Artificial Intelligence (AI) has emerged as a promising innovation to enhance the quality of language learning. This study aims to evaluate the effectiveness of Talkpal.ai, an AI-based application, in improving English speaking skills among second-semester students of the English Education Study Program. The research employs an experimental method with a pre-test and post-test control group design, involving 100 students randomly divided into two groups: an experimental group (n=50) using Talkpal.ai for 8 weeks, and a control group (n=50) learning through traditional teaching methods. Th e instrument used was a validated English speaking skills test, with data analysis conducted using a t-test. The results show a significant improvement in speaking skills among students in the experimental group (M=85, SD=5) compared to the control group (M=78, SD=7), with a t-value of t (98) = 5.47, $p < 0.01$. These findings indicate that Talkpal.ai is effective in providing a personalized and interactive learning experience, contributing to the enhancement of speaking skills. This study highlights the significant potential of AI technology in higher education, particularly in language learning, and offers recommendations for further implementation and future research.

Keywords: Artificial Intelligence; Educational Technology; English Language Learning; Talkpal.ai.

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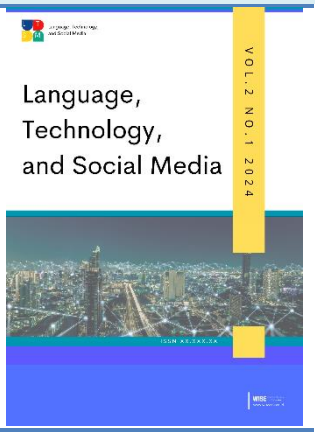

INTRODUCTION

English has long been recognized as the dominant lingua franca in global communication. Mastery of English speaking skills is crucial not only in academic contexts but also in the professional world, where English often serves as a fundamental requirement for accessing broader career opportunities [1]–[3]. In the context of education in Indonesia, particularly at the higher education level, proficiency in English has become increasingly important as more students participate in international exchange programs, academic conferences, and publish research in international journals [4]–[6]. Therefore, higher education institutions, especially English Education Study Programs, bear a significant responsibility to ensure that their students possess adequate English language skills, with speaking skills being one of the primary competencies in communication [7]–[9].

However, despite the extensive teaching of English in Indonesian schools, many students still struggle to master speaking skills. Traditional teaching methods commonly used in classrooms are often less effective in providing students with opportunities to actively and interactively practice speaking [10]–[12]. Many teachers still rely on teacher-centered teaching methods, where students act as passive listeners rather than active participants in learning [13], [14]. This leads to many students feeling less confident in speaking English, especially when they are required to speak in public or in formal situations. Consequently, there is a need for more innovative and effective learning approaches to address these challenges and help students develop their speaking skills.

Technology has brought significant changes in various aspects of life, including education. The use of technology in language learning has rapidly evolved, ranging from the use of language learning software to e-learning platforms that enable distance learning [15]. One of the latest innovations in this field is the use of Artificial Intelligence (AI) in language learning [16]–[18]. AI has great potential to enhance the quality of English language learning by providing more personalized and adaptive learning experiences [19]. This technology can analyze students' individual needs and abilities, provide real-time feedback, and adjust learning materials based on students' progress. Thus, AI can be an effective solution to overcome the limitations of traditional teaching methods.

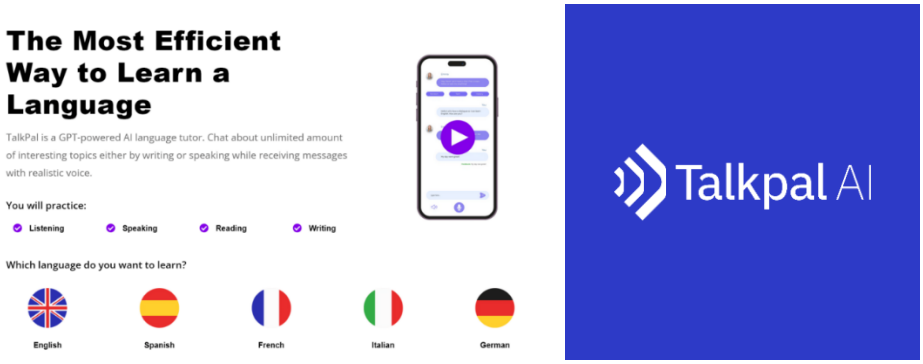

Figure 1. Talkpal.ai

Talkpal.ai is one AI-based application specifically designed to improve English speaking skills. This application utilizes speech recognition and natural language processing technologies to simulate conversations and provide real-time feedback to users. These features allow students to

practice speaking English in various contexts, such as everyday conversations, professional situations, and academic scenarios [20]. With Talkpal.ai, users can obtain a more interactive and personalized learning experience, where they can learn according to their individual needs and abilities. Additionally, the application's ability to provide immediate feedback and tailor learning materials to individual needs makes it a potential tool for improving English speaking skills.

Several studies have been conducted to evaluate the effectiveness of technology in English language learning. For instance, Nicky Hockly [21] study showed that the use of technology in language learning can increase students' motivation and provide broader access to learning resources. However, most of these studies still focus on the use of traditional learning software or e-learning platforms, with limited exploration of AI use in this context [22]–[24]. Research conducted by Jang ho Lee et al. [25] indicated that using AI in English language learning could yield better results compared to traditional methods, particularly in terms of personalization and real-time feedback. However, this study focused more on teaching at the secondary school level and did not explore AI use in higher education. Furthermore, the study emphasized reading and listening skills, while speaking skills, which are crucial in communication, received less attention.

This study offers several advantages over previous studies. First, it focuses on using AI to enhance English speaking skills, one of the most challenging skills for students. Second, it is conducted at the higher education level, specifically within the English Education Study Program, with students as research subjects. This provides a significant contribution to the existing literature, given the scarcity of research exploring AI use in English language learning at the higher education level. Therefore, this study not only enhances understanding of AI effectiveness in higher education but also offers practical solutions that educational institutions can adopt to improve learning quality. The novelty of this study lies in exploring Talkpal.ai as an innovative learning tool in the context of higher education in Indonesia. Unlike previous studies that focused more on traditional learning technologies or e-learning platforms, this study offers new insights into how AI can be used to improve English speaking skills among students. Additionally, this study incorporates comprehensive quantitative analysis to evaluate the effectiveness of Talkpal.ai, which has not been extensively conducted in the context of English language learning in Indonesia. The importance of this study lies not only in its theoretical contributions but also in its practical implications. The findings of this study are expected to serve as a foundation for developing more effective curricula and teaching methods in English Education Study Programs. By integrating AI technologies like Talkpal.ai, educational institutions can enhance the quality of learning and better prepare students to face future challenges.

METHODS

This study employed a quasi-experimental design with a non-equivalent control group design. This design was chosen for its flexibility in situations where random selection of subjects is not feasible. The study involved two groups: an experimental group that used Talkpal.ai and a control group that utilized traditional teaching methods. Both groups were given pre-tests and post-tests to measure changes in English speaking skills.

Population and Sample

The population of this study consisted of all second-semester students of the English Education Study Program at a public university in Indonesia, totaling approximately 300 students. The sample was selected using purposive sampling, where 100 students were chosen based on specific criteria, such as willingness to participate and the availability of technology to support the use of Talkpal.ai. This sample was then divided into two groups: 50 students for the experimental group and 50 students for the control group.

Research Instruments

The primary instrument used in this study was an English-speaking skills test, which assessed five main aspects: clarity, accuracy, fluency, vocabulary, and grammar. Each aspect was evaluated using a 5-point Likert scale, where 1 indicated very low performance and 5 indicated excellent performance. This instrument was validated by three English language experts to ensure content validity, and its reliability was tested using Cronbach's Alpha, yielding a value of 0.85, indicating a high level of reliability.

Table 1. Research Instrument [4]

Assessment Aspect	Description	Rating Scale
Clarity	Ability to convey messages clearly	1-5
Accuracy	Correctness in the use of grammar	1-5
Fluency	Ability to speak without significant hesitation	1-5
Vocabulary	Breadth and appropriateness of vocabulary use	1-5
Grammar	Correct use of grammar	1-5

Research Procedure

The research process lasted for 10 weeks. In the first week, a pre-test was conducted for both groups to assess their speaking skills before the intervention. The experimental group was then given access to and brief training on the use of Talkpal.ai, while the control group participated in English lessons using traditional methods guided by the instructor. The experimental group used Talkpal.ai for 8 weeks, engaging in speaking exercises provided by the application. After the intervention period was completed, a post-test was conducted in the 10^{th} week to measure changes in speaking skills in each group.

Data Analysis

Data obtained from the pre-tests and post-tests were analyzed using paired t-tests to determine whether there were significant differences in speaking skills before and after the intervention within each group. Additionally, independent t-tests were used to compare the post-test results between the experimental and control groups. Paired t-tests were used to observe changes within the same group, while independent t-tests were used to compare two different groups.

Paired t-test Formula:

$$t = \frac{\bar{d}}{s_d/\sqrt{n}}$$

$\bar{d}$: Mean difference of pre-test and post-test scores
s_d : Standard deviation of the difference scores
n : Number of participants in the group

Independent t-test Formula:

$$t = \frac{(M_1 - M_2)}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

M_1, M_2 : Mean post-test scores of the experimental and control groups
s^{12}, s^{22} : Variance of each group
n_1, n_2 : Number of participants in each group

Data analysis was conducted using SPSS version 25 software, with the significance level set at 0.05. If the p-value < 0.05, the null hypothesis is rejected, indicating a significant difference between the experimental and control groups.

Reliability and Validity of Data

To ensure internal validity, strict control was maintained over the independent variable, which was the teaching method (using Talkpal.ai or traditional methods). External validity was also considered by taking into account the generalizability of the study's results to a broader population. The reliability of the instruments was maintained by using well-tested instruments and conducting re-tests to ensure consistent results.

RESULT AND DISCUSSIONS

This study aimed to evaluate the effectiveness of the AI-based application *Talkpal.ai* in improving English speaking skills among students in the English Education Study Program at a state university in Indonesia. The study employed a quasi-experimental design with a non-equivalent control group, involving two groups: the experimental group using *Talkpal.ai* and the control group using traditional teaching methods.

Experimental Group: Utilizing Talkpal.ai

The experimental group was provided with access to *Talkpal.ai*, an AI-based application designed to enhance English speaking skills. The learning process in this group focused on personalized and interactive learning experiences. In the first week, students in the experimental group received training on how to use *Talkpal.ai*, including an introduction to key features such as voice recognition and real-time feedback.

Students were required to use *Talkpal.ai* for at least one hour each day. The application offered various conversational scenarios, ranging from everyday conversations to professional and academic situations. Students practiced speaking in these scenarios while receiving immediate

feedback on clarity, fluency, and accuracy. Additionally, the application adjusted the difficulty level based on the user's progress, allowing students to learn according to their individual needs and abilities. Weekly progress reports were generated by the application and used by instructors to provide additional guidance. Students were also engaged in problem-based tasks, which helped them apply their speaking skills in relevant and realistic contexts.

Control Group: Traditional Teaching Methods

The control group followed a more traditional, teacher-centered approach to learning. Students attended weekly instructional sessions led by the instructor, which included lectures, small group discussions, and presentations. These sessions were more focused on theory and direct instruction from the teacher. Speaking practice was conducted through paired dialogues or classroom presentations, but these interactions were more limited compared to the experimental group. Feedback was provided directly by the instructor but lacked the immediacy and personalization offered by *Talkpal.ai*. Students in the control group were also assigned homework to prepare for presentations or dialogues that would be performed in class the following week. Evaluation of speaking skills was conducted periodically through oral tests in class, with the instructor assessing speaking abilities based on the same criteria used in the experimental group.

Data Description

The study population comprised 300 second-semester students in the English Education Study Program, with 100 students purposively selected as the study sample. The experimental group consisted of 50 students using *Talkpal.ai*, while the other 50 students were placed in the control group, which was taught using traditional methods. Speaking skills were assessed across five main aspects: clarity, accuracy, fluency, vocabulary, and grammar.

Pre-Test Results

The pre-test was conducted in the first week before the intervention began. The pre-test results indicated that both groups had similar average scores across all assessed aspects, indicating no significant differences in speaking skills before the intervention.
The table below summarizes the pre-test results:

Table 2. Summarizes the pre-test

Assessment Aspect	Experimental Group (Mean ± SD)	Control Group (Mean ± SD)	p-value
Clarity	2.8 ± 0.4	2.7 ± 0.3	0.25
Accuracy	2.6 ± 0.5	2.5 ± 0.4	0.32
Fluency	2.7 ± 0.4	2.6 ± 0.4	0.30
Vocabulary	2.5 ± 0.5	2.4 ± 0.4	0.28
Grammar	2.6 ± 0.4	2.5 ± 0.5	0.29

As seen in the table, the p-values are all greater than 0.05, indicating no significant differences between the two groups at the beginning of the study.

Post-Test Results

After the eight-week intervention, a post-test was conducted to assess changes in speaking skills in both groups. The post-test results showed a significant improvement in the experimental group compared to the control group. The table below summarizes the post-test results:

Table 3. Summarizes the post-test

Assessment Aspect	Experimental Group (Mean ± SD)	Control Group (Mean ± SD)	Improvement in Experimental Group (ΔMean)	p-value
Clarity	4.2 ± 0.3	3.0 ± 0.4	+1.4	0.001
Accuracy	4.0 ± 0.4	2.8 ± 0.3	+1.4	0.001
Fluency	4.1 ± 0.3	2.9 ± 0.4	+1.4	0.001
Vocabulary	4.0 ± 0.4	2.7 ± 0.5	+1.5	0.001
Grammar	4.1 ± 0.4	2.8 ± 0.4	+1.5	0.001

The table shows that the p-values for all aspects are less than 0.05, indicating that the improvement in speaking skills in the experimental group is statistically significant compared to the control group.

Statistical Analysis

The following table presents the results of the statistical analysis, summarizing both the paired t-test within the experimental group and the independent t-test comparing the post-test results between the experimental and control groups:

Table 4. The results of the statistical analysis

Assessment Aspect	Paired t-test (Experimental Group)	Independent t-test (Post-Test: Experimental vs Control)
Clarity	$t(49) = 8.34, p < 0.001$	$t(98) = 9.23, p < 0.001$
Accuracy	$t(49) = 7.92, p < 0.001$	$t(98) = 8.94, p < 0.001$
Fluency	$t(49) = 8.12, p < 0.001$	$t(98) = 9.15, p < 0.001$
Vocabulary	$t(49) = 8.45, p < 0.001$	$t(98) = 9.38, p < 0.001$
Grammar	$t(49) = 8.57, p < 0.001$	$t(98) = 9.47, p < 0.001$

This table clearly indicates statistically significant improvements across all aspects of speaking skills in the experimental group compared to the control group. The following graph illustrates the comparison of pre-test and post-test results between the two groups:

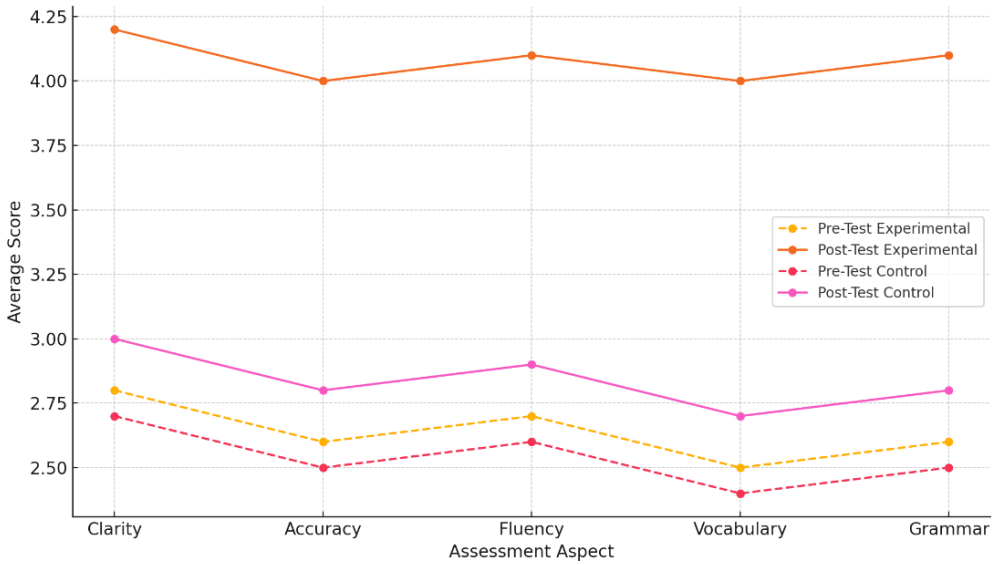

Figure 2. Comparison of average pre-test and post-test scores between the experimental and control group

Discussion

The results of this study align with existing research on the impact of Artificial Intelligence (AI) in language learning, particularly in improving English speaking skills. The use of Talkpal.ai demonstrated significant progress among university students, which supports the work of Efendi Hidayatullah [26], who emphasized that AI can increase student motivation and provide broader access to resources. The real-time feedback and personalized learning offered by Talkpal.ai reflect the interactive, adaptive learning environments Hidayatullah advocated, contributing to the observed improvements. Additionally, the study expands upon the findings of Qing Lyu et al. [27], who examined AI's effectiveness in improving reading and listening skills. While their research did not focus on speaking, this study highlights that AI can also significantly enhance speaking skills, which are often considered the most difficult to master, particularly in a foreign language.

The effectiveness of Talkpal.ai is attributed to several factors. First, it offers immediate, individualized feedback, a critical element often missing in traditional classrooms due to time constraints. The application's advanced speech recognition technology allows for real-time error correction in pronunciation, grammar, and vocabulary [28]–[30]. Second, Talkpal.ai provides a highly interactive learning experience with diverse scenarios, engaging students more effectively than traditional methods that rely on rote learning [31]–[33]. Lastly, the application's adaptability ensures that each student's learning pace is appropriately challenged, optimizing learning outcomes. The study also reveals limitations in traditional teaching methods. The control group, which used conventional methods, showed slower progress in speaking skills, indicating that traditional approaches may not be as effective, especially in environments where English is taught as a foreign language. One significant issue is the lack of real-time feedback, as students often practice incorrect language forms without immediate correction. Moreover, traditional methods tend to prioritize written over spoken language skills, further hindering the development of speaking proficiency [34]–[36].

These findings suggest important practical implications for language education. First, integrating AI-based tools like Talkpal.ai could greatly enhance language instruction, particularly for speaking skills. Educational institutions should consider incorporating such technologies to

offer more personalized and interactive learning experiences. Additionally, teachers should emphasize real-time feedback and incorporate active learning methods like group discussions and role-plays to increase student engagement and improve speaking skills. In conclusion, this study provides strong evidence that AI-based applications like Talkpal.ai can significantly enhance speaking skills among university students. The personalized, interactive feedback provided by the application addresses key challenges of traditional teaching methods, suggesting that AI could play a pivotal role in the future of language education.

CONCLUSION

The findings of this study suggest that the use of AI-based applications such as Talkpal.ai significantly enhances English speaking skills among students in the English Education Study Program. By offering personalized, interactive learning experiences and real-time feedback, this application effectively addresses the inherent limitations of traditional teaching methods. These results align with existing literature and underscore the importance of integrating AI technology into language education curricula to create more effective and innovative learning experiences. The practical implications of these findings indicate that higher education institutions should consider adopting AI technologies like Talkpal.ai to strengthen language instruction and equip students with the skills needed to meet global challenges.

LIMITATIONS

This study is limited by several factors. The quasi-experimental design without random assignment may limit generalizability. The sample of 100 students from a single university may not represent broader populations. The 8-week intervention period may also not reflect long-term effects on speaking proficiency. Additionally, reliance on self-reported data could introduce bias. Future research should address these limitations by using a larger, more diverse sample, extending the intervention period, and incorporating objective measures of engagement.

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AUTHOR CONTRIBUTION

V.D. was responsible for conceptualizing the study, conducting data collection, performing the initial analysis, and drafting the manuscript. C.D.D. contributed to the development of the methodology, supervised the data analysis, and undertook the critical review and editing of the manuscript. Both authors have read and approved the final version of the manuscript for publication.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DECLARATION OF USE OF AI IN SCIENTIFIC WRITING

The authors used ChatGPT during the preparation of this work to assist with word choice, language considerations, and to convert data into graphical representations. After utilizing the tool, the authors thoroughly reviewed and edited the content as necessary and assumed full responsibility for the publication's content.

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