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The Effectiveness of the Talkpal AI-Based Project-Based Learning (PjBL) Model in Enhancing Arabic Speaking Skills

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ABSTRACT

Background: Mastering speaking skills demands more than just theoretical knowledge; it also requires real-world application to foster meaningful and practical learning.

Objective: The purpose of this study is to evaluate the effectiveness of integrating the Talkpal AI-based Project-Based Learning (PjBL) approach in enhancing Arabic speaking skills.

Method: This research adopts a pre-experimental design involving a single group with pre-test and post-test stages. Data collection methods included oral examinations, observations, and interviews. Participants were selected through purposive sampling, comprising 25 second-semester students from class F of the Arabic Language Education Program. The quantitative data gathered were processed and analyzed using SPSS version 24.

Results and Discussion: Findings from the paired sample t-test indicate a significant improvement, with a sig. (2-tailed) value of 0.00, which is below the 0.05 threshold thus, the null hypothesis is rejected in favor of the alternative. This outcome aligns with the N-Gain analysis, which revealed an average score of 82.0326. According to the criteria ($g > 0.7$), this result falls into the high and effective category, also consistent with Malzer's classification.

Conclusion and Implications: Based on the statistical analyses conducted, it is evident that the implementation of the Talkpal AI-based PjBL model significantly enhances students' Arabic speaking abilities. The results suggest that embedding AI-powered tools within project-based instructional strategies can serve as an effective and adaptable means of fostering language skill development in the context of digital-age education.

Keywords: *Project-Based Learning, Talkpal AI, Speaking Skills, Arabic Language*

ABSTRAK

Latar Belakang: Penguasaan keterampilan berbicara menuntut penguasaan teori sekaligus penerapannya dalam situasi nyata, sehingga tercipta proses pembelajaran yang bersifat aplikatif dan memacu mahasiswa tidak hanya memahami konsep secara konseptual, melainkan juga menggunakannya dalam interaksi sehari-hari.
Tujuan: Penelitian ini bertujuan mengevaluasi efektivitas penerapan model Project Based Learning (PjBL) yang didukung Talkpal AI dalam meningkatkan keterampilan berbicara bahasa Arab.
Metode: Desain penelitian ini adalah pra-eksperimen dengan satu kelompok yang diukur sebelum dan sesudah perlakuan (one-group pre-test–post-test). Data dikumpulkan melalui tes lisan, observasi, dan wawancara. Sampel dipilih secara non-probability dengan teknik purposive sampling, melibatkan 25 mahasiswa semester 2 kelas F Program Studi Pendidikan Bahasa Arab. Analisis data kuantitatif dilakukan menggunakan SPSS 24.
Hasil dan Pembahasan: Hasil uji t-berpasangan menunjukkan perbedaan yang signifikan antara skor pre-test dan post-test (sig. 2-tailed = 0,00 < 0,05), sehingga H0 ditolak dan Ha diterima. Temuan ini diperkuat oleh perhitungan N-Gain dengan nilai rata-rata 82,0326, yang masuk kategori tinggi (g > 0,7) dan sesuai dengan kriteria Malzer (g > 0,7) sebagai kategori efektif.
Kesimpulan dan Implikasi: Berdasarkan analisis statistik, dapat disimpulkan bahwa pembelajaran dengan model PjBL berbasis Talkpal AI efektif dalam meningkatkan keterampilan berbicara mahasiswa. Implikasi penelitian ini menunjukkan bahwa integrasi teknologi AI dalam model pembelajaran berbasis proyek merupakan strategi yang adaptif dan relevan untuk memperkuat kompetensi bahasa di era digital.

Kata Kunci *Project Based Learning, Talkpal AI, Keterampilan Berbicara, Bahasa Arab*

INTRODUCTION

Mastering speaking skills is a crucial aspect in foreign language learning, including Arabic language learning. The objective of teaching speaking skills is to develop the ability to interact or communicate. [1] Speaking skills enable a person to express thoughts in the form of ideas, opinions, desires, or feelings verbally [2] confidently and effectively, which is essential in various life contexts, both in formal and informal situations.[3] Learning speaking skills requires not only a good mastery of theory but also the application of theory to real practice[4] , This creates applicable learning that encourages students not only to understand concepts theoretically but also to implement them in the communication process in everyday life, thereby enhancing understanding and skills comprehensively. One learning model that aligns to teach speaking skills mentioned above is the Project-Based Learning model.

The PBL model adopts an innovative teaching approach that places students at the heart of contextual, practice-based projects [5]. As such, PBL serves as an effective means of cultivating 21st century skills namely critical thinking, creative problem-solving, collaboration, and effective communication [6], [7], [8]. Furthermore, it generates rich, meaningful learning experiences by aligning tasks and guidance with real-life scenarios [9]. At its core, Project-Based Learning empowers learners to lead explorations of authentic social challenges, fully involving them in purposeful problem-solving activities. Through this process, students craft their own learning pathways and ultimately produce valuable, tangible outcomes.[10]

One way to implement PjBL is through multimedia-driven instruction [11], particularly by integrating AI-powered interactive media. Such AI-enhanced multimedia not only captures learners' attention [12] but also promotes deeper comprehension and critical-thinking abilities,

while offering students hands-on involvement in the learning activities. This active participation enriches their overall experience and heightens both engagement and motivation. [13] By fully immersing students in the instructional cycle, they develop a more thorough understanding of the content. [14] Among the AI-based interactive multimedia platforms applicable to project-based speaking instruction is Talkpal AI.

Talkpal AI offers an innovative approach to enhancing language proficiency through artificial intelligence (AI) technology and interactive features. One of Talkpal's advantages is its ability to simulate real-life conversations with native speakers, helping users understand the language through a more natural and contextual experience [15]. This application can also simulate conversations and provide real-time feedback. These features allow students to practice speaking in various situations, such as daily conversations, professional environments, and academic contexts. Talkpal.ai also offers an interactive learning experience that can be tailored to each user's needs and abilities. With its ability to deliver quick responses and personalized content, this application serves as an effective tool for supporting the development of speaking skills in a more enjoyable and structured way. [16]

Speaking skill instruction in the Arabic Language Education Program, Faculty of Language and Arts, State University of Jakarta (UNJ), is designed to equip students with language abilities that are not only theoretical but also practical. In practice, mastering speaking skills requires more than just an understanding of linguistic concepts—students also need to be actively engaged in communication situations that resemble real-life conditions. Therefore, a learning approach that emphasizes direct experience, active participation, and problem-solving becomes essential to implement.[17]

Interviews with second-semester students in the Arabic Language Education Program revealed that they encounter several obstacles in developing their speaking proficiency. First, restricted vocabulary makes it difficult for them to convey ideas appropriately across different contexts. Second, frequent pronunciation errors undermine their confidence when speaking. Finally, the lack of sufficient opportunities to practice orally leaves students feeling they do not have enough chances to improve their speaking skills.

In response to these challenges, the Project-Based Learning (PjBL) model offers a suitable alternative approach to be applied in the learning process. Through PjBL, students are encouraged to design and complete communication-based projects that require the application of speaking skills in real-life contexts. This activity promotes the practical learning of speaking skills. The use of Talkpal AI has become an essential tool to support the success of PjBL. This application helps students practice speaking through simulated conversations that resemble interactions with native speakers. Talkpal also provides real-time feedback and adjusts the material according to each user's ability. In this way, students can complete oral-based projects as a platform for practicing, enriching their vocabulary, and improving their Arabic pronunciation.

Based on the theoretical review discussed, there is a clear alignment between the Project-Based Learning (PjBL) model and the features offered by Talkpal AI in speaking skill instruction. PjBL provides a project-based framework that encourages students to practice the language in real-life contexts, while Talkpal supports this process through artificial intelligence technology that enables conversation simulations, real-time feedback, and personalized learning tailored to individual needs. The integration of both creates an active, authentic, and contextual learning experience. Therefore, the application of PjBL with the support of Talkpal AI becomes an effective strategy to improve speaking skills in the Arabic Language Education Program at Universitas Negeri Jakarta (UNJ), while also aligning with efforts to develop technology-based learning innovations in higher education.

There are several studies relevant to this research, including a study by Siti Durotun Naseha et al [18] This research seeks to assess how effective TalkPal AI is in enhancing students' skills in Arabic debating. This research concludes that TalkPal AI is an effective innovation in supporting Arabic debate learning among students. Furthermore, the study by Anita Debora Simangunsong et al. Which proves that the implementation of project-based learning models through Artificial Intelligence (AI) can enhance students' creativity and learning achievement. The study conducted by Marlina Rahmawati et al. [7] The findings demonstrate that applying the PjBL approach significantly enhances students' proficiency in speaking Arabic.

Referring to previous studies, this research aims to strengthen earlier research related to learning using the Project-Based Learning (PjBL) model in speaking skill instruction with the assistance of AI, specifically Talkpal AI. However, this study has characteristics that differentiate it from previous research, as it explains the effectiveness of the Project-Based Learning (PjBL) model based on AI, specifically the Talkpal AI application, as an alternative solution to the issues identified by the researcher in speaking skill instruction. Another difference lies in the research location and the type of skill to be achieved, which in this case is speaking skills.

LITERATURE REVIEW

Project Based Learning (PjBL)

Project-Based Learning (PjBL)[9], [11] is an instructional model that positions students as active participants in the learning process by engaging them in projects connected to real-life situations. These projects are not merely about the final outcome, but form an essential part of the learning journey, where students learn to plan, explore, apply knowledge, and reflect on what they have learned.[19]

PjBL is also recognized as a student-centered approach that emphasizes exploration, collaboration, and the creation of products through meaningful projects. This model addresses real-world issues and encourages students to work together in developing solutions through various stages of active learning [20]. In the context of language education, PjBL offers learners the chance to use the target language in a practical and structured manner while completing contextually relevant projects.

Moreover, PjBL helps foster essential 21st-century skills such as critical thinking, creativity, communication, and collaboration. By engaging in authentic tasks, students are required to apply linguistic knowledge to solve problems, present findings, and interact with peers using the target language. This approach promotes learner autonomy and responsibility, as students take charge of their learning processes from planning to execution. In addition, the integration of digital tools, such as Talkpal AI, further enhances the learning experience by providing real-time feedback, personalized guidance, and increased opportunities for practice. These elements make PjBL a comprehensive and dynamic method for improving language proficiency in a meaningful and engaging way.

Talkpal AI in Language Learning

Talkpal AI is an artificial intelligence (AI)[21], [22] based platform designed to help language learners develop communication skills, particularly in speaking. This system provides interactive conversation simulations with the ability to give automatic feedback on pronunciation, sentence structure, and language fluency. Talkpal AI allows users to practice speaking independently anytime and anywhere, supporting flexibility and independence in learning. AI-based technology can create a more personalized, adaptive, and interactive learning experience, which is difficult to achieve in conventional learning.

The Talkpal platform provides users with a unique opportunity to engage with native speakers in ways that closely mirror real-life situations. This method helps learners gain a deeper understanding of the language through direct interaction and immersion. Talkpal for Education offers educators a simple and efficient administrative interface, allowing them to create student accounts with ease. This feature enables instructors to manage language learning in a more structured and organized way [15]

Speaking Skills in Arabic Language Learning

Speaking skills are a fundamental aspect of language mastery, as they serve as the primary tool for communication in everyday life. In communication, speaking skills allow individuals to convey ideas, express thoughts, respond to interlocutors, and build social relationships effectively. Without strong speaking abilities, a person will struggle to engage in interactions, both in formal and informal contexts. [23]

In addition to being a communication tool, speaking skills also serve as a bridge between theory and practice. This ability demonstrates how well an individual truly understands and internalizes the language they are learning. Speaking is a constructive process that requires control over various language components simultaneously in a short amount of time. Therefore, this skill needs to be developed through intensive and contextual practice, not just through memorization or grammar theory.[24]

METHOD

This study was conducted as field research employing a quantitative research approach. Quantitative research involves the use of measurements, calculations, formulas, and precise numerical data in the stages of planning, implementation, hypothesis formulation, methodological application, data analysis, and conclusion drawing [25]. The research adopts a pre-experimental design using a single group with both pre-test and post-test, aimed at identifying differences before and after the intervention. These differences are interpreted as the outcome of the treatment or intervention applied during the experiment. Data collection was carried out through oral examinations, observations, and interviews. The study population consisted of students enrolled in the Arabic Language Education Program at UNJ. The sampling technique used was non-probability sampling, specifically purposive sampling, targeting second-semester students from class F of the Arabic Language Education Program, totaling 25 participants. The quantitative data collected were analyzed using SPSS version 24.

RESULTS AND DISCUSSION

The findings presented in this section encompass data obtained from both the pre-test and post-test conducted after implementing the Project-Based Learning (PjBL) model integrated with Talkpal AI for speaking skills instruction. Prior to administering these tests, the researcher carried out direct observations of the participants to examine the process of learning speaking skills in the classroom and to identify any obstacles faced during the instructional activities.[26] To strengthen the findings regarding the issues faced in speaking skills learning, the researcher conducted in-depth interviews with 6 students about the learning process, the challenges or problems they encountered, and alternative solutions suited to the issues.[27] Additionally, the researcher also conducted in-depth interviews with the speaking skills instructor to discuss the challenges and issues within the learning process. Based on the findings, the identified issues include limited vocabulary, mispronunciations of Arabic words by students, which lead to a lack of self-confidence when speaking, and insufficient practice opportunities for students. The researcher implemented an alternative solution through the use of the Project-Based Learning (PjBL) model integrated with Talkpal AI.[28]

In the subsequent phase, the researcher administered a pre-test, followed by a treatment, and then a post-test. The instruments utilized in both the pre-test and post-test comprised five oral questions, assessed using four criteria: Pronunciation, Fluency, Vocabulary, and Content and Coherence. The data obtained from the pre-test and post-test were analyzed through a paired sample t-test and N-Gain using SPSS. Prior to conducting the effectiveness analysis, the researcher carried out a normality test as a prerequisite for performing statistical analysis or assumption testing. This assumption testing serves as a requirement that must be fulfilled before proceeding with further statistical evaluation of the sample data. Given the limited sample size, the Shapiro-Wilk method was employed for the normality test. The outcomes of the normality test conducted with SPSS are presented below.

Table 1. Results of Normality Test

Results	Sig. Value
Pre-test	.285
Post-test	.277
N	25

Referring to the table above, the significance value for the pre-test normality test is 0.285, while the significance value for the post-test normality test is 0.277. As both values exceed the threshold of 0.05, it can be inferred that the data from the pre-test and post-test follow a normal distribution.

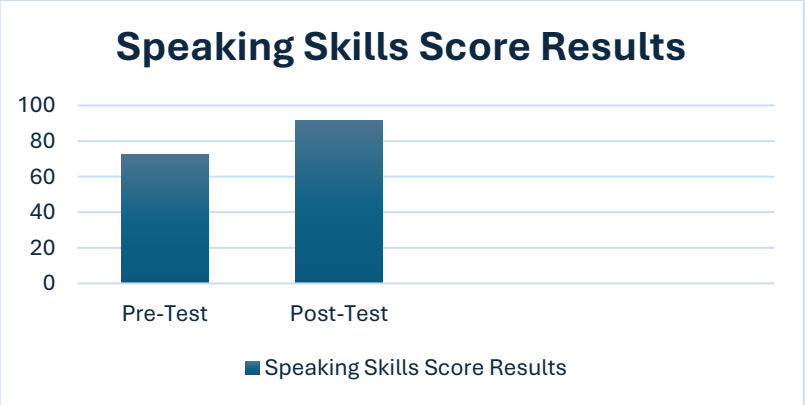
After performing the normality test as a prerequisite assumption, the researcher proceeded with a paired sample t-test to assess whether there was a significant difference between the means of the two related groups. Based on the results of the paired sample t-test for the pre-test and post-test values, the meaning differences are as follows:

Table 2. Results of Paired Sample T Test

	Pair	Mean	Sig (2-tailed)	N
Experimental Class	Pre-Test	72.30	.000	25
	Post-test	91.80	.000	25

According to the table above, the average score for the pre-test speaking skills is 72.30, while the average score for the post-test is 91.80, showing an increase of 19.05. This suggests that there is a difference between the pre-test and post-test speaking skill scores. The difference is statistically significant, as indicated by the sig. (2-tailed) value of 0.00, which is less than 0.05, leading to the rejection of H_0 and acceptance of Ha. These findings confirm that there is a significant difference between the pre-test and post-test speaking skill scores of the students. Below is a diagram illustrating the difference in the average speaking skill scores before and after the test.

Diagram 1 Difference in Average Pre-test and Post-test Scores



The researcher also carried out an analysis of the normalized gain (N-gain) score to assess the effectiveness of the Project-Based Learning (PjBL) model utilizing Talkpal AI in enhancing speaking skills, by calculating the difference between the pre-test and post-test scores. The N-gain test was conducted using SPSS and subsequently analyzed through four categories of N-gain effectiveness, as outlined below:

Tabel 3. Kategori Tafsiran Efektivitas N-Gain Malzer

Percentage %	Interpretation
<40	Not Effective
40-55	Less Effective
56-75	Quite Effective
>76	Effective

Table 4. Categories of N-Gain Score Distribution Hake

N-Gain Score Range	Categories
g>0,7	High
0,3≤ g≤ 0,7	Medium
g,0,3	Low

Based on the SPSS calculations, the N-Gain values obtained are as follows:

Table 5. N-Gain Values

Value	N-Gain Percentage
Mean	82.0326
Minimum	56.76
Maximum	100.00
Range	43.24

The results of the N-Gain score test presented in the table above indicate that the average N-Gain score is 82.0326, which falls within the Hake classification of g > 0.7, signifying a high level of effectiveness. According to the N-Gain effectiveness interpretation standards set by Malzer, this score is categorized as effective. After conducting several statistical tests, including the normality test, paired sample t-test, and N-Gain analysis, it can be concluded that, overall, the Project-Based Learning (PjBL) model based on Talkpal AI is highly effective in enhancing Arabic speaking skills.

DISCUSSION

This section explains the alignment of the research findings with the theories presented in the introduction, particularly those related to Arabic speaking skill learning using the Project-Based Learning (PjBL) model based on Artificial Intelligence (AI) technology, specifically utilizing the Talkpal AI application.

The initial analysis focuses on how well the Project-Based Learning (PjBL) model aligns with improving Arabic speaking skills. According to the research results, the implementation of the PjBL model was shown to significantly enhance students' speaking abilities. The use of the PjBL model in this context motivated students to participate actively in real-world projects that necessitated the use of Arabic for oral communication. By adopting the PjBL approach, students not only acquired speaking skills but also developed the ability to design and manage projects that encouraged the practical application of the language in meaningful contexts. This aligns with the

research by Marlina Rahmawati et al [28] which states that PjBL encourages active involvement of learners in meaningful, contextual, and collaborative learning, especially in language skills.

Further research shows that the implementation of the PjBL model also facilitates the development of students' social skills, such as teamwork and effective communication, which are essential in speaking Arabic. Through collaboration in projects, students can interact in more authentic and real situations, boosting their confidence and speaking ability in social contexts. Therefore, PjBL not only improves language skills but also prepares students to adapt to environments that demand strong communication skills.[29]

The second analysis is the relevance of utilizing AI to improve speaking skills, in this case, Talkpal AI, to support Arabic language learning both in the classroom and independently. Talkpal AI allows students to access materials and speaking practice anytime and anywhere, thus supporting the principle of flexibility in modern learning. Talkpal AI also provides virtual interaction based on conversation, enabling students to practice speaking repeatedly and personally, with immediate feedback that helps correct pronunciation, fluency, and the coherent organization of ideas. This demonstrates that AI technology in language learning enables an adaptive, personalized, and responsive learning experience tailored to individual needs.[30]

In addition, the use of Talkpal AI also allows students to receive immediate and specific feedback, which is crucial in honing speaking skills. By adapting the learning process according to individual abilities and progress, this technology enhances the effectiveness of Arabic language learning, accelerates the learning process, and boosts students' motivation to practice consistently.

The third analysis examines the effectiveness of the approach, which is statistically validated. The results from the paired sample t-test clearly show a significant difference between the pre-test and post-test scores, with a sign. (2-tailed) value of 0.000, which is less than 0.05. This leads to the rejection of H_0 and the acceptance of Ha, confirming that the use of the PjBL model based on Talkpal AI significantly enhances students' speaking skills. This conclusion is further supported by the N-Gain score analysis, where the average N-Gain score of 82.0326 places it in the high category ($g > 0.7$) according to the Hake classification and is deemed effective based on Malzer's standards. As a result, it can be concluded that this learning model is not only theoretically effective but also empirically validated.

CONCLUSION AND IMPLICATIONS

Project Based Learning (PjBL) is defined as a learning model that emphasizes learning activities through the completion of meaningful and contextual projects, which encourages active involvement of students in developing language skills. In this study, the researcher applied the PjBL model integrated with the Talkpal AI platform as a supporting tool for speaking skill development in Arabic language learning. Talkpal AI serves as a responsive speaking practice companion, allowing students to interact orally with an AI-based system that provides immediate feedback on the speaking exercises performed by the students. The PjBL model offers a learner-centered learning experience, while Talkpal AI enhances the self-practice process through technology. The statistical tests, including paired sample t-test and N-Gain test, show that the application of the Project Based Learning model based on Talkpal AI is proven to be effective in improving speaking skills in Arabic, particularly in the areas of pronunciation, fluency, vocabulary, and content coherence.

The implications of this study suggest that the integration of AI-based technology into project-based learning models can be a relevant and adaptive strategy to enhance language competencies in the digital age. This approach can be more widely applied in the context of teaching other foreign languages, especially to encourage independent learning and continuous speaking practice. The limitations of this study include the small sample size, consisting of only

one class (25 students), and the relatively short duration of the study. Additionally, this study did not deeply measure students' perceptions of using Talkpal AI in their learning process.

For future studies, it is suggested to include a larger and more diverse group of participants from various semester levels to produce results that can be more broadly applied. Future research could also examine the integration of Talkpal AI into other language skills, such as listening or writing, and assess its effectiveness through both quantitative and qualitative methods for a more thorough analysis. Additionally, exploring the use of alternative AI tools, such as voice-recognition applications or more interactive AI platforms, could provide valuable insights into their potential for supporting the development of other language skills. This approach would offer a deeper understanding of how different AI technologies contribute to enhancing Arabic language proficiency more holistically.

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