

The Effect of Using Talkpal AI on Improving the Arabic Vocabulary of Secondary School Students

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ABSTRACT

This study aims to determine the effect of using Talkpal AI on improving Arabic vocabulary mastery among students at Al-Azhar Kelapa Gading Islamic High School. The background of this study is based on the low level of Arabic vocabulary mastery among students, which is caused by the use of learning media that is not interactive enough, thereby impacting students' low motivation to learn. In fact, the school has adequate supporting facilities, such as smart TVs in each classroom, which enable the application of technology-based learning media. This study uses a quantitative approach with a quasi-experimental method and a nonequivalent control group design. There were 44 students participating in the study, divided into an experimental class and a control class. Data collection techniques were carried out through observation and Arabic vocabulary tests. The results showed that the average posttest score of the experimental class (32.50) was higher than that of the control class (26.27). The Mann-Whitney test showed a significance value of 0.002 (< 0.05), which means that there is a significant effect of using Talkpal AI on improving students' Arabic vocabulary. Thus, Talkpal.ai is proven to be effective as an artificial intelligence-based learning medium in helping to improve students' mastery of Arabic vocabulary.

Key words: Talkpal AI; Learning Media; Vocabulary; Arabic Language Learning

INTRODUCTION

Arabic language learning is usually a compulsory subject, especially in Islamic schools. In madrasas, from Madrasah Ibtidaiyah to Madrasah Aliyah, Arabic is taught. The aim is to encourage, guide, develop, and nurture skills and foster a positive attitude (Munir et al., 2023). In Arabic language learning, vocabulary is part of the language. Anshari and Noor (2024) state that vocabulary mastery is a very basic component and one of the main factors in a person's ability to master the language. In addition, adequate vocabulary mastery enables a person to construct sentences and paragraphs fluently and produce clearer and more convincing

communication (Isnaini, 2023). Therefore, vocabulary is the main foundation in second language learning, because through vocabulary mastery, students can grasp meaning when communicating orally and when understanding texts, expressions, and other language skills (Faradisa, 2023).

In reality, many students still have difficulty mastering Arabic vocabulary, which is one of the main obstacles in the learning process. This is in line with the findings of Khotimah and Nurlaila (2024), who stated that weak vocabulary mastery can hinder overall language comprehension. The Arabic language has specific characteristics, such as differences in harakat that can change the meaning of a word, so vocabulary mastery requires not only an understanding of meaning but also correct pronunciation. Good vocabulary mastery plays an important role in the development of other language skills, including grammar (Rahayu et al., 2024). One external factor that contributes to this difficulty is the use of learning media that lacks variety. The use of creative and innovative learning media has been proven to increase interest in learning, reduce boredom, and help students understand the material more easily (Tanggur et al., 2022; Jauza & Albina, 2025). Therefore, the use of learning media that is relevant to technological developments is an important supporting factor in creating effective and engaging learning in the digital age (Ali, 2025).

Learning media is understood as all forms of tools, both physical and non-physical, that serve to help teachers convey learning messages more effectively to students. Media can be defined as an intermediary that facilitates the process of conveying information from the sender to the receiver (Pagarra et al., 2022). In addition, media also plays an important role as a tool that enables learning messages to be more easily understood by students (Furoidoh 2020). In selecting media, it must be relevant to the learning objectives and situation, suit the characteristics of the students, be accurate in content, be available when needed, and consider cost aspects so that it can be used optimally (Tamami & Hermawan, 2023). It cannot be ignored that educators have a responsibility to utilize effective and efficient learning media to achieve optimal learning objectives.

In this era of globalization, communication, technology, and information have become increasingly sophisticated. It cannot be ignored that technology has influenced almost all areas of life, including education. Therefore, the world of education must be able to utilize all forms of technology available to support student learning through appropriate learning media (Rizkya et al., 2024). One rapidly developing innovation is the use of artificial intelligence (AI) technology in learning. AI has shown great potential in revolutionizing the way we understand, design, and implement education systems. One aspect that is a major focus in modern education is the personalization of learning, which is an approach that tailors the learning process to the needs, abilities, and preferences of each individual (Widodo et al., 2024). This technology is believed to be able to increase student motivation, especially in foreign language learning. As a tool, AI has tremendous potential. It can identify learners' weaknesses with high accuracy, offer adaptive

learning methods, and create immersive experiences through interactive simulations (Ramadhan, 2023). This makes learning more interesting because, in addition to encouraging students to take an active role, it keeps learning in step with the times.

At Al-Azhar Kelapa Gading Islamic High School, Arabic is one of the subjects taught to strengthen students' religious understanding. However, based on the results of observations conducted by researchers, the Arabic vocabulary mastery of 11th grade students is still very low, even when it comes to introducing themselves, many are still unable to do so. Of course, this is due to many factors, including uninteresting lessons that make students less motivated to learn, and the lack of use of interactive learning media. Many students only obtain learning materials from books provided by teachers, learning has not taken advantage of technological advances, namely the use of artificial intelligence as a learning medium, and the inadequate utilization of school facilities that are sufficient to make learning more interesting, such as the use of smart TVs in each classroom. Therefore, learning innovations are needed that can improve vocabulary mastery through methods that are more interesting and in line with technological developments.

Based on the problems encountered, a form of innovation is needed as a solution to overcome them. Therefore, the researcher chose appropriate and effective learning media to improve Arabic vocabulary mastery in grade XI students at Al-Azhar Kelapa Gading Islamic High School. The use of this learning media is expected to rekindle students' interest in learning Arabic and minimize boredom during the learning process. The learning media used by the researcher to overcome this problem is digital technology-based learning media assisted by artificial intelligence, namely Talkpal AI. Talkpal AI is artificial intelligence-based learning media designed to help students improve their Arabic vocabulary through interactive, adaptive, and practice-oriented exercises. This platform provides various vocabulary themes such as names of fruits, food and drinks, types of professions, surrounding objects, and other categories that are systematically arranged according to learning needs. Based on the above description, the researcher intends to conduct a study entitled "The Effect of Using talkpal.ai on Improving High School Students' Arabic Vocabulary Mastery." This study aims to determine the extent to which talkpal AI influences the improvement of Arabic vocabulary mastery among students in the experimental and control classes.

LITERATURE REVIEW

Previous Related Study

Previous research relevant to the use of artificial intelligence (AI) in language learning shows that AI-based technology has a positive contribution to improving students' language skills. One study was conducted by Torkhani (2025) entitled AI-Enhanced Language Learning: The Impact of Talkpal AI on EFL Undergraduate Students' English Speaking Skills. This study aims to examine the effectiveness of

using Talkpal AI in improving the speaking skills of EFL students, including fluency, pronunciation, vocabulary, and grammar. The study used a quasi-experimental method with a pretest-posttest design on 40 pre-intermediate EFL students in Kuwait. The results showed a significant improvement in students' speaking skills after using Talkpal AI with a significance value of $p < 0.05$. Although this study did not specifically focus on vocabulary improvement, the findings indicate that the use of AI technology such as Talkpal AI has great potential in supporting comprehensive foreign language learning.

Another study supporting the use of AI in language learning was conducted by Abu Qbeita (2024) through a study titled *The Effect of Using Artificial Intelligence on Learning Vocabulary among Jordanian EFL University Students*. This study aimed to determine the effect of using AI-based applications on the vocabulary mastery of EFL students at Al-Hussein Bin Talal University, Jordan. The research methods used included MANOVA analysis, T-test, and ANCOVA to compare the learning outcomes between the experimental group using the Duolingo application and the control group using conventional methods. The results showed that students who learned using AI-based applications experienced a significantly higher increase in vocabulary mastery compared to the control group. In addition, this study also found that there were no differences in learning outcomes based on gender, so it can be concluded that AI-based learning media is effective for use by all students.

Furthermore, research by Supriyanto and Toifah (2024) entitled *The Effectiveness of Using Artificial Intelligence (AI) in Arabic Language Learning in the Society 5.0 Era: Systematic Literature Review* examines the use of AI in the context of Arabic language learning. This study used a Systematic Literature Review method that went through eight stages, starting from the formulation of research questions to the presentation of review results. The results of the study show that the use of AI has a positive impact on the Arabic language learning process, especially in increasing student motivation to learn through a more interactive and enjoyable learning experience. In addition, AI also plays a role in helping students practice language skills such as speaking, writing, understanding grammar, and providing instant feedback and translation assistance. These findings confirm that the integration of AI in Arabic language learning is relevant and effective in responding to educational challenges in the digital era.

Vocabulary

According to Wahyudin (2020), vocabulary is a collection of words that form a language and can be understood by someone so that it can be used as a tool for communication in society. According to Hilmy (2024), vocabulary is a collection of words in a language whose meanings can be understood so that when arranged into sentences, they produce meanings that are understood by others and used for communication, both verbally and in writing. Furthermore, Fitri et al. (2022) add that vocabulary is a collection of words in various forms, ranging from affixed words to combinations of several words that are the same or different, and each word has its own meaning. In line with this, Murniati and Marliati (2022) argue that

vocabulary includes a number of words that have meaning and serve to facilitate communication. Furthermore, Hasibuan and Lubis (2023) state that vocabulary includes every word used in written and spoken form in a language, and each of these words has a meaning that can be understood. They also emphasize that vocabulary includes various types of words, such as nouns, adjectives, and verbs, all of which are used in language activities. In line with this opinion, Usman et al. (2022) emphasize that vocabulary plays an important role in language skills because a person's ideas or thoughts can only be clearly understood if they are conveyed with the right choice of words and in the appropriate context. From the various opinions above, it can be concluded that vocabulary is a collection or inventory of words that have specific meanings and are used by a person in communication, both verbally and in writing. Good vocabulary mastery is the main foundation for conveying ideas, feelings, and information effectively in a language.

Understanding the Talkpal AI

Talkpal AI is an artificial intelligence-based application that is relevant for use in Arabic language learning, particularly in improving vocabulary mastery through exercises connected to everyday contexts. This platform was developed as an interactive learning medium that allows users to have direct conversations with AI, just like communicating with native speakers. This application supports more than 57 languages, including Arabic and English, making it very suitable for use in foreign language learning in schools. Talkpal is equipped with various features that support learning effectiveness, such as interactive speaking exercises that help students build confidence and expand their vocabulary, and automatic feedback that assesses pronunciation, grammar, and fluency. In the context of Arabic language learning, these features provide opportunities for students to enrich their vocabulary through context-based conversations while identifying and correcting mistakes immediately. In addition, Talkpal also provides a solution to the limited time for speaking practice in class, as students can practice independently without feeling awkward or afraid of making mistakes. The findings of Azzanulhaq and Sakaroni's (2024) research show that most high school students have a positive perception of using Talkpal as a medium for learning Arabic, especially in terms of its ease of use, effectiveness, and the suitability of its features to the learning material. Thus, Talkpal AI not only functions as a language practice application but also as an interactive learning medium that supports vocabulary mastery, pronunciation, and other linguistic aspects through adaptive features, instant feedback, and gamification elements. These advantages make Talkpal a relevant and potential medium for increasing student motivation, participation, and confidence in learning Arabic at the high school level.

METHOD

Design and Samples

This type of research uses a quasi-experimental design with a nonequivalent control group. This research was conducted by giving treatment to the experimental group and providing a control group for comparison. In this design, neither the experimental group nor the control group was selected randomly (Abdullah et al., 2021). The population in this study included all 156 students in the 11th grade at Al-Azhar Kelapa Gading Islamic High School from five classes in the 2025/2026 academic year. The sample is understood as a part of the population that has characteristics representative of the whole, where in this study two classes were selected, namely XI E as the experimental class and XI F as the control class. The sampling technique used was non-probability sampling and specifically used purposive sampling, which is the determination of samples based on the average midterm exam scores of students in each class.

Instrument and Procedure

In this study, the data collection instrument used was test items because the study aimed to assess students' vocabulary mastery. The test method in this study was an objective test, consisting of 31 questions divided into four types, including multiple choice, filling in the blanks in a dialogue, grouping words, and matching words with pictures so that the level of Arabic vocabulary mastery of Al-Azhar Islamic High School students on the subject of food and beverages could be determined. The questionnaire was reviewed by two Arabic teachers to assess content validity, ensuring that each item was relevant and appropriate for measuring vocabulary mastery. To test construct validity, Pearson Product Moment was used with correlation values above 0.30 retained. Reliability testing using Cronbach's Alpha yielded a coefficient of 0.87, indicating a high level of reliability and internal consistency.

For the experimental class at the initial meeting, the researcher began by providing an overview of the technical implementation of learning using talkpal AI, then administered a pre-test to measure the students' prior knowledge of Arabic. Then the researcher began using Talkpal AI with the topic "Food and Beverages." The procedure was as follows: The researcher displayed the Talkpal AI application on the television by opening the "course" page. After that, the researcher opened the "absolute beginner" level to find the theme to be studied in this research, namely "food and beverages." Then, the students listened to each vocabulary word that appeared, starting from its spelling, pronunciation, and meaning. The researcher then asked group representatives to repeat the words aloud. Finally, the researcher reviewed the vocabulary words that the students had learned in this meeting. For the second and third meetings, Talkpal AI will still be used, but during the third meeting, an evaluation will be conducted on the learning that has been carried out during the learning process to determine the extent of the students' learning outcomes by administering a post-test.

Whereas for control class at the initial meeting, the researcher began by providing an overview of the technical aspects of learning during the study, then administered

a pre-test to measure the students' prior knowledge of Arabic. After that, the researcher began teaching using conventional media, where learning was based solely on textbooks. The researcher read a dialogue aloud, and the students listened and then repeated what the researcher had read. The second and third meetings still used the same media and techniques, but during the third meeting, an evaluation of the learning that had been carried out during the learning process was conducted to determine the extent of the students' learning outcomes by administering a post-test.

Data Analysis

The data analysis techniques used in this study include descriptive statistical tests, in which the research data will be described through descriptive statistics that include the amount of data, minimum and maximum values, averages, and standard deviations. In addition, the researcher also uses inferential statistical analysis to test the hypothesis regarding the effect of using Talkpal AI on increasing students' vocabulary. Before testing the hypothesis, a prerequisite test was conducted because the selection of the type of statistical test depends on the distribution and characteristics of the data. The prerequisite tests used included a normality test using the Kolmogorov-Smirnov formula to see if the data was normally distributed, as well as a homogeneity test using the Levene formula to determine whether the variance of the two data groups was the same. If the test results show that the data is normal and homogeneous, then the hypothesis test is performed using the Independent Samples t-test parametric test. However, if the data is not normally distributed, then the hypothesis test uses the Mann–Whitney U Test non-parametric test. Thus, the type of hypothesis analysis used in this study is adjusted to the results of the prerequisite test so that the interpretation of the results is precise and accurate.

RESULT AND DISCUSSION

This study was conducted at Al-Azhar Kelapa Gading Islamic High School involving two groups of eleventh grade students. Class XI E was designated as the experimental group that received learning using Talkpal AI media, while class XI F acted as the control group that followed learning with conventional media. Research data were collected through objective Arabic vocabulary tests given to both groups at the pre-test and post-test stages.

Pretest Result

Before treatment, both groups were given an initial test to measure their level of mastery of basic Arabic vocabulary.

Table 1. Pretest Results

Class	Number of Student	Highest Score	Lowest Score	Average
Experimental (XI E)	22	35	10	18.1364
Control (XI F)	22	35	16	28.2727

The pretest results showed that the average score of the experimental class was 28.13, while the control class obtained an average score of 28.27. The difference between the two mean scores was only 0.14 points, indicating that both groups had almost the same level of Arabic vocabulary mastery before the treatment was given. This similarity suggests that the experimental and control classes started from a relatively equal baseline. Therefore, any differences found in the posttest results can be more confidently attributed to the use of Talkpal AI as the treatment rather than to initial differences between the groups.

Posttest Result

After the experimental class received treatment using Talkpal Ai media for three meetings, both classes took a post-test to measure the increase in Arabic vocabulary.

Table 2. Posttes Results

Class	Number of Student	Highest Score	Lowest Score	Average
Experimental (XI E)	22	36	17	32.5000
Control (XI F)	22	36	15	26.2727

The posttest results indicate a clear improvement in students' Arabic vocabulary mastery after the treatment. The experimental class achieved an average score of 32.50, with the highest score reaching 36 and the lowest score 17, showing a generally better performance after learning using Talkpal AI. In contrast, the control class obtained a lower average score of 26.27, with the highest score of 36 and the lowest score of 15. This difference in mean scores suggests that students who were taught using Talkpal AI demonstrated higher vocabulary achievement compared to those who learned through conventional methods.

Comparison of Pretest and Posttest Results

The comparison between pretest and posttest scores is illustrated in the bar chart below.

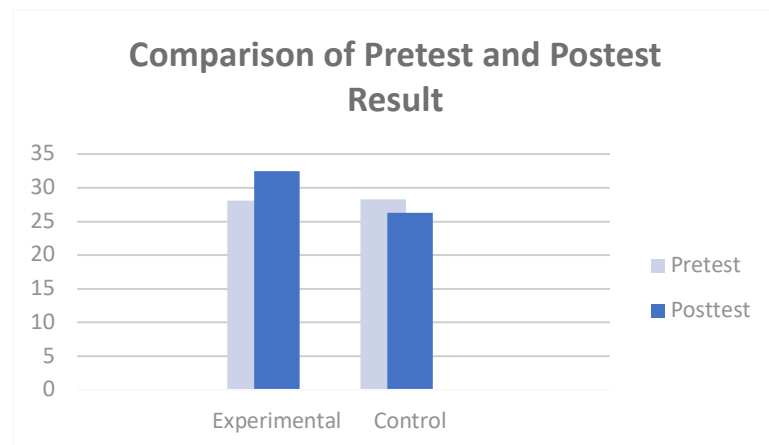


Figure 1. Comparison of Average Pretest and Posttest Scores

The graph shows that the experimental class experienced a significant increase in average vocabulary scores after learning with Talkpal AI, while the control class showed a slight decline. This visual comparison shows that the use of Talkpal AI has a stronger positive impact on students' Arabic vocabulary mastery compared to conventional learning methods.

Normality Test

Before conducting further analysis, a normality test was performed using the Kolmogorov-Smirnov method to ensure that the data was normally distributed.

Table 3. Normality Test

Group	Sig. (kolmogorov-Smirnov)	Distribution
Experimental Class Pretest	0,000	Not Normally Distributed
Experimental Class Posttest	0,000	Not Normally Distributed
Control Class Pretest	0,000	Not Normally Distributed
Control Class Posttest	0,143	Normally Distributed

Based on the Kolmogorov–Smirnov normality test, the results show that the experimental class pretest and posttest data, as well as the control class pretest data, are not normally distributed because the significance values are less than 0.05. Meanwhile, the control class posttest data are normally distributed, as the significance value is greater than 0.05. Since not all data meet the assumption of normal distribution, a non-parametric statistical test, namely the Mann–Whitney U Test, was used for hypothesis testing.

Homogeneity Test

The Levene's test of homogeneity of variances was used to determine whether the data in the pretest and posttest of both classes had the same variance.

Table 4. Homogeneity Test

Group	Sig. (Levene's test)	Conclusion
Pretest	0,599	Homogeneous
Posttest	0,016	Not homogeneous

The homogeneity test results show that the pretest data were homogeneous (Sig. = 0.599 > 0.05), indicating equal variances between the experimental and control groups. However, the posttest data were not homogeneous (Sig. = 0.016 < 0.05), indicating unequal variances between the two groups.

Mann-Whitney test

The Mann–Whitney U Test is used to determine the difference in scores between two independent groups to compare pretest results to see the initial abilities of both groups and then compare the posttest results between the two groups to see significant differences after treatment.

Table 5. Mann-Whitney Test

Group	Asymp. Sig. (2-Tailed)	Conclusion
Pretest	0,841	No significant difference
Posttest	0,002	Significant difference

The Mann–Whitney test results indicate that there was no significant difference between the experimental and control groups before treatment. However, after the implementation of Talkpal AI, a statistically significant difference was found in the posttest results. This finding confirms that Talkpal AI has a significant effect on improving students' Arabic vocabulary mastery.

Hypothesis Testing

Table 6. Hypothesis Testing Summary

Statistical Test	Asymp. Sig. (2-Tailed)	α	Decision
Menn-Whitney (Posttest)	0,002	0.05	Reject H_0

The result of the Mann–Whitney U test shows a significance value of 0.002, which is lower than the significance level of 0.05. Therefore, the null hypothesis (H_0) is rejected. This indicates that there is a significant difference between the posttest scores of the experimental class and the control class. Thus, the use of Talkpal AI has a significant effect on improving students' Arabic vocabulary mastery.

Based on statistical analysis and visual data presentation, it can be concluded that the use of Artificial Intelligence (AI)-based learning media, namely Talkpal AI, has a significant effect on improving students' Arabic vocabulary mastery. Students in the experimental class showed higher learning outcomes than those in the control class because Talkpal AI provides interactive learning through contextual vocabulary exercises, pronunciation practice, and automatic feedback that encourages active learning and motivation. This improvement is clearly seen from the comparison of pretest and posttest average scores, where the experimental class experienced a more significant increase than the control class, thus concluding that AI-based learning media is more effective in helping students understand, remember, and use Arabic vocabulary optimally.

The results of this study are in line with previous studies showing that the use of Artificial Intelligence technology in language learning can improve students' language skills. Torkhani's (2025) study found that the use of Talkpal AI significantly improved EFL students' speaking skills, including vocabulary. Furthermore, Abu Qbeita's (2024) research also proves that AI-based applications such as Duolingo have a positive impact on improving the vocabulary mastery of EFL students. These findings reinforce the results of this study that the integration of AI in language learning has great potential to improve student learning outcomes.

Another advantage of Talkpal AI lies in its ability to create a more flexible and stress-free learning environment. Students can practice vocabulary without fear of making mistakes because corrections are provided automatically by the system. This is very helpful for students who previously lacked confidence in using Arabic both verbally and in writing. This finding aligns with the research by Azzanulhaq and Sakaroni (2024), which states that students have a positive perception of using Talkpal as a language learning tool because it is considered easy to use, effective, and tailored to their learning needs.

Although this study shows positive results, there are several limitations that need to be considered. This study was only conducted in one school with a limited number of samples, so the results cannot be generalized widely. In addition, this study only measures short-term vocabulary acquisition improvement. Further research is recommended to examine the long-term impact of using Talkpal AI and its connection to other language skills such as speaking and writing Arabic. Overall, the results of this study indicate that Talkpal AI is an effective learning medium for improving students' Arabic vocabulary mastery. The use of interactive, adaptive, and instant feedback-providing Artificial Intelligence-based media can significantly increase learning motivation, student activity, and learning outcomes.

Therefore, the integration of Talkpal AI in Arabic language learning can be an innovative alternative that is relevant to educational needs in the digital age.

CONCLUSION

This study proves that the use of Talkpal AI has a significant effect on improving the Arabic vocabulary mastery of 11th grade students at Al-Azhar Kelapa Gading Islamic High School. Students who participated in learning using Talkpal AI showed higher learning outcomes compared to students who learned using conventional media. Through direct interaction with the artificial intelligence-based system, students became more active, motivated, and confident in practicing vocabulary in a more realistic and communicative context. The use of Talkpal AI allows students to learn vocabulary contextually through interactive exercises, pronunciation, and immediate automatic feedback. This helps students better understand the meaning of vocabulary while correcting pronunciation and usage errors. Conversely, the improvement in the control class was relatively lower, indicating that conventional learning has not been able to provide the same engaging and effective learning experience in improving Arabic vocabulary mastery.

Based on these findings, Talkpal AI can be recommended as one of the learning media that can be used regularly by Arabic teachers to improve students' vocabulary mastery. Teachers are advised to adjust the selection of vocabulary themes to the learning material and utilize the available practice and feedback features for an optimal learning process. Additionally, the use of Talkpal AI can be combined with short discussions or follow-up exercises in class to reinforce students' understanding. For future researchers, this study opens up opportunities to further examine the use of Talkpal AI or other artificial intelligence-based media on other Arabic language skills, such as speaking, reading, or grammar skills. Further research can also be conducted over a longer period or at different levels of education to determine the long-term impact of AI use in Arabic language learning and its contribution to student motivation and learning independence.

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