SCHOOLAR: Social and Literature Study in Education
Vol. 5 No. 1 June 2025, Page. 1 - 7
E-ISSN: 2797-0299

The Effectiveness of Duolingo in Speaking Skills at Al-Ikhlas Islamic Boarding School

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ABSTRACT
English has become an essential language for communication in today's era, including for English extracurricular students at Al-Ikhlas Islamic Boarding School Tambakberas Jombang. This study aims to measure the effectiveness of using Duolingo as one of the AI chatbot technologies to improve students' speaking skills, and to explore how the implementation of Duolingo in the Islamic boarding school environment, which has limited access using electronic tools. This study used a quantitative method with a quasi-experimental design, specifically a non-equivalent control group design, and the data were collected from 32 female students who were divided into 2 classes (experimental class and control class), each class containing 16 female students. The results showed that students in the experimental class experienced a significant improvement in their speaking skill test than the control class. The implementation of the AI chatbot (Duolingo) at the Islamic Boarding School was limited to using only two laptops due to strict electronic usage policies. Nevertheless, this study highlights the importance of integrating technology into language learning activities, emphasizing that AI-based platforms like AI chatbots (Duolingo) can enhance students' speaking skills even within environments with restricted digital access.

***Keywords**: Duolingo; Speaking Skill; Learning Media*

INTRODUCTION

Language is a crucial tool for communication (Nishanthi, 2018). It enables people to express and understand complex thoughts, emotions, and ideas. Given its role in connecting individuals, groups, and nations, learning a language becomes essential. English, as the most widely spoken language in the world, holds the status of a global language used in international communication, education, business, and technology. As a result, mastering English-especially speaking skills-has become increasingly important for students to succeed in both academic and professional contexts (Afidah et al., 2021).

In Indonesia, English is taught as a foreign language and included in school curricula from elementary to senior high school. However, many students still struggle with productive skills like speaking. They often lack confidence, vocabulary, fluency, and exposure to real conversational English. Traditional classroom instruction tends to focus more on grammar and reading, while speaking practice is limited due to large class sizes and time constraints.

At Al-Ikhlas Islamic Boarding School Tambakberas Jombang, which focuses on religious education, English is offered through extracurricular programs. This boarding school is home to around 250 female and 280 male students. Despite their enthusiasm for learning, many students find it difficult to express themselves in English, especially in speaking and listening activities. Observations show that several students still experience difficulty when completing oral English assignments or engaging in spontaneous conversations, often due to low proficiency and limited practice.

Improving students' speaking skills is essential to help them actively participate in global communication(Tridinanti & Palembang, 2024). To address this need, language teachers must adopt more effective and engaging teaching strategies. In this digital era, one promising solution is the integration of Artificial Intelligence (AI) into language learning. AI-based tools offer personalized, interactive, and student-centered learning experiences that support the development of communicative competence. One

of the examples is the AI chatbot feature in Duolingo, a popular language learning app. AI chatbots are intelligent systems that simulate real conversation and respond based on user input (Okonkwo & Ade-ibijola, 2021). Duolingo, with over 16 million monthly users worldwide, offers English learning through translation, quizzes, stories, and real-time AI interaction. It provides simplified grammar, slower speech, vocabulary support, and personalized feedback that help learners, especially beginners, practice speaking with reduced anxiety.

According to (Rahayu&Dong, 2023), integrating AI into English language teaching enhances learners' engagement and supports autonomous learning. By interacting with AI chatbots, students can practice speaking English anytime and anywhere, without fear of being judged. This kind of environment is particularly beneficial in Islamic boarding schools where the use of electronic devices is often limited and where opportunities to speak English with native speakers are rare.

The researcher intends to implement AI chatbots (Duolingo) as a learning medium to improve the speaking skills of students in the English extracurricular class at Al-Ikhlas Islamic Boarding School. By using AI chatbots, students can receive constant exposure to English conversation practice, develop confidence, and gradually improve their fluency (Taha & Abdulrahman, 2023). Moreover, using this technology encourages digital literacy and prepares students to adapt to modern learning environments. Besides improving students' speaking skills, this study also seeks to explore the challenges of implementing AI tools in an Islamic Boarding School setting where technological restrictions are common. The findings of this study are expected to offer insights into the effectiveness of AI-based learning tools in improving speaking performance and promoting a more interactive English learning experience.

In conclusion, this study aims to assess the implementation and effectiveness of Duolingo's AI chatbots as a learning medium to enhance students' speaking skills at Al-Ikhlas Islamic Boarding School. It is hoped that the results will contribute to the improvement of language teaching strategies, especially in similar educational settings, and inspire educators to make use of innovative tools that support language learning in a more engaging and effective way.

METHOD

This study employed a quantitative approach with a quasi-experimental design, specifically the Non-equivalent Control Group Design (Sugiyono, 2020). The participants were 32 students from the English extracurricular program at Al-Ikhlas Islamic Boarding School, divided into two groups: an experimental group and a control group, with 16 students in each group. The assignment of participants to each group was non-random.

The experimental group was given treatment using Duolingo as a learning medium to practice English speaking, while the control group received conventional instruction without the use of AI tools. The implementation took place over a set period, during which the experimental group used Duolingo to engage in various English-speaking activities.

The instrument used to collect data was a speaking test (Widodo et al., 2023). The test material focused on self-introduction, which is a fundamental topic in English speaking for beginners. A pre-test was administered to both groups before the experimental group received the Duolingo treatment to measure the students' initial speaking ability. After the treatment period, a post-test was conducted for both groups to assess the improvement in speaking performance. Students' speaking performances were evaluated using a standardized speaking rubric, which included five main criteria: Pronunciation, fluency, vocabulary, comprehension, and grammar.

To analyze the data, the researcher used descriptive and inferential statistics. Before conducting the hypothesis test, the data were first subjected to a normality test to determine whether the data were normally distributed and a homogeneity test to check the equality of variances between the two groups.

After ensuring the data met the assumptions, the researcher applied an Independent Sample t-test to determine whether there was a statistically significant difference in the post-test scores between the experimental and control groups. This test was used to assess the effectiveness of using Duolingo in improving students' speaking skills.

RESULT AND DISCUSSION

Result

The description below explains the data and research results obtained from the implementation of the pre-test and post-test on the experimental class and control class.

1. Students' Speaking Test Score

The data were collected from students' outcomes of the pre-test and post-test administered to the experimental class and control class of extracurricular students at Al-Ikhlas Islamic Boarding School. Here is the description:

- Experimental Class

Table 1. Speaking Score of Experimental Class

Students' Speaking Scores of Experimental Class				
No.	Student	Pre-test	Post-test	Gained Score
1	S1	40	72	32
2	S2	43	81	38
3	S3	46	75	29
4	S4	54	84	30
5	S5	53	78	25
6	S6	25	65	40
7	S7	68	90	22
8	S8	37	77	40
9	S9	46	78	32
10	S10	60	90	30
11	S11	27	79	52
12	S12	41	70	29
13	S13	44	66	22
14	S14	59	92	33
15	S15	56	85	29
16	S16	32	70	38
	Mean	45,6875	78,25	32,5625

Graph 1. Speaking Score of Experimental Class

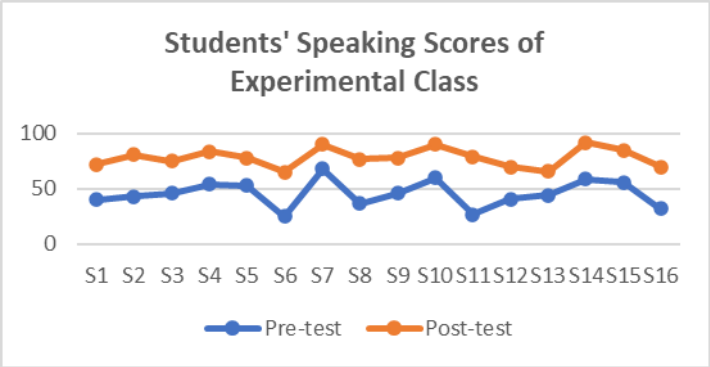

Table 1 presents the speaking test results obtained from the experimental class, which include students' scores before and after being treated with AI chatbots (Duolingo). In the pre-test, the average speaking score was 45.6875, while in the post-test, it increased to 78.25, showing an average improvement of 32.5625 points. These results indicate a significant enhancement in students' speaking skills after the implementation of AI chatbots (Duolingo) as a learning tool. Furthermore, Line Graph 1 is used to illustrate this improvement more clearly, where the blue line represents the students' pre-test scores and the red line shows their post-test scores. Based on the data presented in both the table and the graph, it can be concluded that the use of AI chatbots (Duolingo) has a positive impact on improving students' speaking skills.

- Control Class

Table 2. Speaking Score of Control Class

Students' Speaking Scores of Experimental Class				
No.	Student	Pre-test	Post-test	Gained Score
1	S1	32	40	8
2	S2	60	68	8
3	S3	29	40	11
4	S4	50	56	6
5	S5	47	60	13
6	S6	46	54	8
7	S7	56	57	1
8	S8	34	44	10
9	S9	43	46	3
10	S10	65	66	1
11	S11	39	50	11
12	S12	55	55	0
13	S13	48	60	12
14	S14	27	50	23
15	S15	43	49	6
16	S16	58	59	1
	Mean	45,75	53,375	7,625

Graph 2. Speaking Score of Control Class

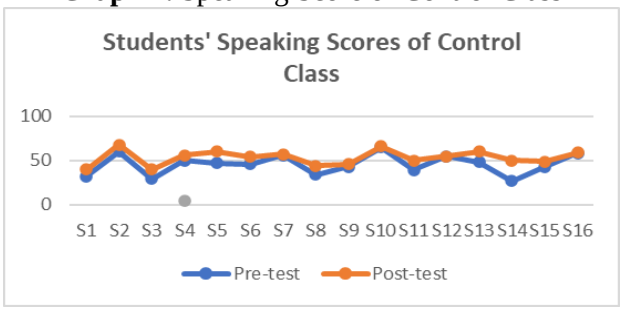

Table 2 presents the speaking test scores of the control class, including both pre-test and post-test results. The control class did not receive any special treatment involving AI chatbots (Duolingo) and was only taught using conventional methods. The average pre-test score was 45.75, which is relatively similar to the pre-test score of the experimental class. The post-test score increased slightly to 53.375. Although there was an improvement of 7.625 points, the score remained below 60 and can be considered as a minor improvement. This indicates that without the implementation of AI chatbots (Duolingo), assisted learning, students' speaking skills did not significantly improve. This finding is also supported by graph 2, which shows that the red line representing the post-test scores only rises slightly, with some students even showing no improvement at all.

Based on the post-test results from the control class, neither the speaking test nor the listening test showed a significant improvement. This indicates that the learning approach applied in the control class, which relied entirely on conventional methods without the integration of artificial intelligence (AI)-based technology, was less effective in fostering students' language skill development. The absence of AI chatbots (Duolingo) as a learning tool may be one of the main factors contributing to the limited progress in scores. In other words, the lack of AI-based treatment in the teaching and learning process in the control class negatively impacted the effectiveness of language instruction, particularly in enhancing students' speaking and listening skills.

To evaluate the impact of using the AI chatbot (Duolingo) application on students' speaking and listening skills. The data for this analysis were obtained from the mean post-test scores of two different classes. The t-test results were further supported by an effect size analysis. The presentation of the results is as follows:

Table 3. T-test Result of Post-test Scores in Speaking

Group Statistics					
Class		N	Mean	Std. Deviation	Std. Error Mean
Speaking Test Result	Post-test (Control)	16	53,38	8,397	2,099
	Post-test (Experiment)	16	78,25	8,426	2,107

Table 3 presents the results of the t-test analysis conducted on the speaking post-test scores of the experimental and control classes, each consisting of 16 students. The experimental class had a mean score of 78.25, while the control class had a mean score of 53.38. Additionally, the standard deviation for the post-test scores in the experimental class was 8.426, whereas in the control class it was 8.397.

Table 4. Independent T-test of Post-test Score of Experimental and Control Classes in Speaking

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Speaking Test Result	Equal variances assumed	,011	,919	-8,364	30	,000	-24,875	2,974	-30,949	-18,801
	Equal variances not assumed.			-8,364	30,000	,000	-24,875	2,974	-30,949	-18,801

To strengthen the findings of the independent sample test on the post-test scores, the researcher also analyzed the independent sample test results for the gained scores, as shown in Table 4. The results revealed that the two-tailed significance value was 0.000, which means $p < 0.05$. In other words, the significance level of 0.000 is lower than the threshold of 0.05. Therefore, the null hypothesis (Ho) was rejected, and the alternative hypothesis (Ha) was accepted. This indicates that there was a statistically significant difference between the two classes. Thus, it can be concluded that there is a significant difference in learning outcomes when using the AI chatbots (Duolingo) application to improve the speaking skills of students in the English extracurricular program at Al-Ikhlas Islamic Boarding School.

Discussion

This study aimed to investigate the effectiveness of using AI-based chatbots, specifically AI chatbots (Duolingo), in improving the speaking skills of students participating in English extracurricular class at Al-Ikhlas Islamic boarding school. The findings indicate that AI chatbots (Duolingo) were effective in improving students' speaking skills. These results are in line with the previous research conducted by (Kuvvetli, 2025), which indicated that the use of Artificial Intelligence (AI)-based learning media can effectively support the improvement of students' speaking skills.

1. Effectiveness of AI chatbots (Duolingo) in Speaking Skills

The data analysis revealed a significant improvement in students' speaking skills after using AI chatbots (Duolingo). Based on the researcher's classroom observations, students in the experimental class became more confident and willing to speak, even those who were previously shy. They were especially excited when practicing speaking through Duolingo's interactive speaking challenges, indicating that the gamified experience contributed to increased self-confidence and speaking fluency. This finding aligns with (Tridinanti & Palembang, 2024), who stated that AI chatbots (Duolingo) significantly enhance speaking performance in English learners.

2. Challenges during Implementation

Several obstacles were encountered during the implementation:

- Limited use of electronic devices within the Islamic boarding school environment posed a major challenge, as AI chatbots (Duolingo) are an internet-based application.
- Unstable internet access, particularly in areas far from the main router, hindered optimal use of the application.
- Short research duration, with only four days of implementation, limited the ability to observe long-term results. Future research would have benefited if the research had been longer in the implementation period and had produced more reliable outcomes.

3. Advantages of Using AI Chatbots (Duolingo) at Al-Ikhlas Islamic Boarding School

Despite the challenges, the use of AI chatbots (Duolingo) also has advantages:

- The use of AI chatbots (Duolingo) positively influenced students' motivation. Since technology-based learning is rarely used in the Islamic boarding school's teaching practices, the presence of AI chatbots (Duolingo) created a refreshing and engaging learning atmosphere. Students appeared more enthusiastic during the lessons, and the use of the spacious hall attracted the curiosity of other students passing by, indicating increased interest in English learning.
- The use of AI chatbots (Duolingo) in the Islamic boarding school environment also had a positive impact on other language teachers, such as Arabic teachers. They became more aware of modern AI-based educational technology and recognized its potential to enhance the effectiveness of language instruction. This awareness fosters opportunities for interdisciplinary collaboration and the broader application of technology within the Islamic boarding school educational setting.

4. Disadvantages of Using AI Chatbots (Duolingo) at Al Ikhlas Islamic Boarding School

While the integration of AI chatbots (Duolingo) showed several benefits, some disadvantages also emerged during their implementation within the Islamic boarding school context:

- The integration of AI-based tools in a traditional Islamic boarding school environment sometimes conflicted with the students' daily routines and values. Some students and staff were initially hesitant about incorporating foreign digital tools into a setting that prioritizes religious and moral education. There were concerns that prolonged exposure to technology might distract students from their core religious studies.
- Not all students possessed adequate digital literacy skills to use Duolingo effectively. Some required additional guidance to navigate the app, particularly those who had limited prior exposure to smartphones or learning applications. This situation slowed down the learning process and increased the workload for the instructor.
- The use of smartphones and internet access opened up the potential for distractions, such as accessing unrelated content or social media during learning sessions. This required increased supervision and control from the teacher, which was challenging to manage in a short research duration.

CONCLUSIONS

Based on the results of the pre-test and post-test administered to both the experimental and control classes, the study provides clear evidence that the use of AI chatbots (Duolingo) significantly improves students' speaking skills.

The experimental group, which used Duolingo, showed a remarkable improvement in their speaking ability, while the control group showed only minor progress. The statistical analysis supports these findings, confirming the effectiveness of AI chatbot-assisted learning.

In conclusion, AI chatbots like Duolingo offer an effective and engaging approach to enhancing speaking skills, especially in settings where traditional methods may be limited. Educators are encouraged to integrate such tools into language learning programs to foster better outcomes and increase student motivation.

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