

# The Effect of Artificial Intelligent Technology Used (Duolingo Application) to Enhance English Learning

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## Abstract

This research aims to figure out the effect of Artificial Intelligence Technology in Duolingo Application to Enhance Speaking and Listening Ability. This study uses a quantitative technique where the researcher conducts experimental research using a quasi-experimental design this research all the second semester students of the English program with a population of 101 students and divided into 3 classes. The researcher used purposive sampling method, so the class used was class C as the research sample. Where there were 31 students, 16 students as the experimental class and 15 students as the control class. The results of the information investigation utilized descriptive statistics in analyzing the data and for hypothesis testing using normality test, homogeneity test, T-test and One Way- ANOVA. The means score for the speaking experimental class is 88.63, then 75.38 for the listening, and for the speaking control class it is 80.53, then 52.13 for the listening. Then with the result of significance (Sig.)  $0.000 < 0.05$ . In conclusion, that there is an influence by utilizing the Duolingo application to enhance speaking abilities in second semester of Hamzanwadi University in the English Education Study Program for the academic year 2022-2023.

**Keywords:** Artificial Intelligence technology, Duolingo application, English learning.

Innovation in light of the improvement of the period in the modern transformation 4.0 which keeps on advancing undeniably, which essentially brings about changes in people from a few viewpoints, both regarding perspectives, communicating and making due. Like Danuri (2019), From time to time technological progress continues to develop, starting from the era of agricultural technology, industrial technology, information technology, and the communication and information technology. Since mechanical advances keep on creating

as per progresses in science, practically all nations, urban communities, and, surprisingly, individuals' homes as of now have cutting edge gadgets.

Since innovation is something appropriate (quick creating), mechanical improvements enormously influence changes in monetary, social, political, social and instructive exercises of human existence. Alongside worldwide mechanical advances, it has impacted all parts of life, both in the fields of economy, governmental issues, workmanship

and culture, even in the realm of schooling (Kurniawati, 2020). With innovation being formed into something much more noteworthy which is called knowledge. Ririh et al. (2020) Humans have created a development called artificial intelligence is a technology that improves data and correspondence innovation that has emerged over the last decade.

From the artificial intelligence consciousness that has been created, it is trusted that can assist with expanding information for a huge scope, even past the limit of people. Artificial intelligence (AI) is the improvement of computer innovation that is added to a framework that can be set up in a logical setting or it can likewise be called, characterized as the mental prowess of logical elements (Siahaan et al., 2020). Simulated intelligence is one type of the improvement of machines refinement during the modern unrest 4.0, to make another development from machines (PCs) to take care of business like people. The principal idea of AI is to make devices from machines that can think like people (Jacob, 2019). Artificial intelligence helps conditions become safer to treat and can make people more intellectually qualified to speak to convey judgment in communicating.

English in Indonesia itself has become an obligation for students to be studied in subjects at their schools. Many students take great interest in learning English as their second language. However, not a few students are reluctant to study English, because they think that English is a very difficult and complicated language to learn, especially because the pronunciation in Indonesian is very different from the pronunciation in English.

Learning application media that are utilized in the learning and training cycle can guide understudies' consideration and inspiration to advance any place they are to concentrate all alone as per their capacities. Application media can stand out for understudies since they are promptly centered around when understudies open their cell

phones and with fast access. Without need to enter different applications to open the preparation site and without the need to convey products through learning media anyplace and whenever.

In this study, the researcher used an application-shaped media called Duolingo to help the student learning process. Which, this Duolingo application is an application that is supported by artificial intelligence. As Crowther et al. (2017) said that The Duolingo app is downloadable for all tablets and mobiles using iOS, Android, and Windows operating systems, with learner progress on one platform synced with the others. Than Widyastuti & Kusumadewi (2018) Duolingo is to support more modern and interesting teaching activities such as mobile or mobile-based applications web. In the Duolingo application, all types of abilities have been embedded to improve students' English language skills, ranging from speaking, reading, listening and writing.

However, this time the researcher focused on students' speaking and listening skills in Hamzanwadi University because the main problem of the students are lacking in terms of sepeaking and listening. Then, how to enhance students' speaking and listening English skills. While most of students at Hmzanwadi University come from rural areas and their schools of origin do not support the facilities in school. For example a laboratory of language class that is specifically used to train students' language skills. Speaking expertise is the main ability to get unknown dialect or second language learning. Among the four fundamental language abilities, speaking is viewed as the main expertise in mastering an unknown dialect or second language (Rao, 2019) In Aristy et al. (2019) which says that speaking is connected with oral correspondence where the speaker and audience trade data and pass on messages. Speaking is a conveying of one's goals (thoughts, contemplations, hearts) to others by utilizing communicated in language so these expectations can be perceived by others (Rahayu, 2020).

Listening skill is an important skill that must be learnt by the English learners. Communication has an important role in the teaching and learning of English language. There must be an interaction between at least two or more persons involving a speaker and listener (Ardhany & Handini, 2019). Then listening also is one of the essential skills that indicates a person's ability to receive and interpret information in the communication process. Listening is the first beginning of natural (oral) speech; develop in the early stages of language and a person's first language (and other naturalistic acquisitions of languages) that depend on hearing (Karmiati & Kurniawati, 2018). In Listening has a crucial role in foreign language learning and communication (Thi & Nhat, 2021). Listening is a crucial capability of social interaction among listening, speaking, reading, and writing, and it has been identified that people receive new message are more effective by listening than reading (Sularti et al., 2019)

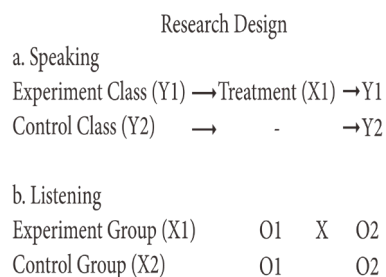
The identification of the problems in this research are (1) Is the Artificial Intelligence Technology in Duolingo application effective to Enhance Speaking and Listening Ability for The Second Semester of Hamzanwadi University? (2) How effective is Artificial Intelligence Technology in Duolingo Application to Enhance Speaking and Listening Ability for The Second Semester of Hamzanwadi University English study program?

**Method**

This study utilizes a quantitative technique where the Ono (2020) quantitative exploration strategies can be deciphered as exploration techniques in view of the way of thinking of positivisme, used to analyze specific populaces or tests. Therefore the researcher uses experimental research to determine the positivisme data. Like Rahi (2017) that The experimental method involves the process of testing variables in which the impact of one variable can be seen with other variables.

Because of this experimental research

is research that aims to identify the causal relationship of one or more dependent variables by manipulating the independent variable in a controlled condition. As made sense of about variable by Purwanto (2019) that independent variable are variables that make hypothetical prospects affect different variables, while variables are of essential interest. In addition, this research design includes a quasi-experimental research. Researchers prefer to use quasi-experimental research because it uses an organized sample group. Like Hastjarjo (2019. P, 189) said "A quasi-experiment is an experiment in which the smallest experimental unit is not assigned to the experimental and control groups". For more details on the **Figure 1**.



The test of speaking is carried out by means of an oral exam, then for the listening the test is carried out by listening the audios for the beginning and end of learning. Population of this research were 101 students and the samples were 31 students. The test was carried out In selecting the sample, the writer used purposive sampling technique. This technique is used to determine the sample with certain consideration (Hidayati, 2014) on the experimental group of 16 students and the control group of 15 students, so that the total number of students was 31 students of the Hamzanwadi University, C class of second semester English study program. The data analysis technique used in this research is prerequisite test and hypothesis test. The analysis prerequisite test used in this study is using the normality test and homogeneity test, testing the hypothesis using the T-test formula and One Way-ANOVA.

## Results and Discussion

The results of the data analysis show the positive impact of the application media used to improve students' speaking and listening skills. This is influenced by a variety of very attractive factors, such as the functionality provided by the application. As explained in Widyastuti & Kusumadewi (2018) Duolingo is designed to be entertaining, like a game, so that the user's brain can easily absorb it. In addition, this application is used daily by researchers who are constantly reminding them to exercise.

Learning with the Duolingo application will make the teaching and learning process pleasant and attract students' attention. The main goal is to help students enjoy studying and make learning English pleasant. In addition, students are encouraged to take responsibility for solving problems, not just listening to explanations. Students will learn more about the new vocabulary as they actively answer all the questions prepared in the application and are actively involved in applying them to the surrounding real world. Remember that people who are very fluent in English are practiced in their daily lives by communicating with others and actively participating in learning, rather than sitting alone in the classroom to find it is needed.

Based on the results of data analysis, obtained in several ways, among others:

### 1. Descriptive Statistics

#### a. Speaking

The results of the data show that the highest pre-test score for the experimental class is 65 and the lowest is 55, with a mean number of questions 59.25 with a standard deviation of 3.044 and standard (Std.) error 0.762. In the post-test results, the highest score was 93, while the lowest score was 84, for mean score is 88.63 questions with a standard deviation of 3.030 and standard (Std.) error 0.758.

Then for control class data. In the pre-test, the highest score was 70 and the lowest score was 50, with a mean of 59.20, a standard deviation of 5.943 and standard (Std.) error

1.534. The result of the post-test score was 86 for the highest score, with mean number of questions 80.53 with a standard deviation of 3.563 and standard (Std.) error 0.920. Based on the result can be seen on the **Table 1**.

Table 1. Descriptive Statistics of Speaking

| Class                | N  | Min | Max | Mean  | Std. Deviation | Std. Error |
|----------------------|----|-----|-----|-------|----------------|------------|
| Pre-test Experiment  | 16 | 55  | 65  | 59.25 | 3.044          | 0.761      |
| Post-test Experiment | 16 | 84  | 93  | 88.63 | 3.030          | 0.758      |
| Pre-test Control     | 15 | 50  | 70  | 59.20 | 5.943          | 1.534      |
| Post-test Control    | 15 | 75  | 86  | 80.53 | 3.563          | 0.920      |

#### b. Listening

The results of the data show that the highest pre-test score for the experimental class is 79 and the lowest is 60, with a mean number of questions 70.69 with a standard deviation of 5.582 and standard (Std.) error 1.396. In the post-test results, the highest score was 83, while the lowest score was 63, and for mean score was 70.69 questions with a standard deviation of 5.632, and standard (Std.) error 1.408.

Then from the control class data. In the pre-test, the highest score was 63 and the lowest score was 40, with a mean of 48.13 and a standard deviation of 7.717 and standard (Std.) error 1.993. The result of the post-test score was 69 for the highest score and the lowest is 43, with a mean number of questions 52.13 with a standard deviation of 8.501, and standard (Std.) error 2.195. Based on the result can be seen on the **Table 2**.

Table 2. Descriptive Statistics of Listening

| Class               | N  | Min | Max | Mean  | Std. Deviation | Std. Error |
|---------------------|----|-----|-----|-------|----------------|------------|
| Pre-test Experiment | 16 | 60  | 79  | 70.69 | 5.582          | 1.396      |

|                      |    |    |    |       |       |       |
|----------------------|----|----|----|-------|-------|-------|
| Post-test Experiment | 16 | 63 | 83 | 75.38 | 5.632 | 1.408 |
| Pre-test Control     | 15 | 40 | 63 | 48.13 | 7.717 | 1.993 |
| Post-test Control    | 15 | 43 | 69 | 52.13 | 8.501 | 2.195 |

**2. Required Statistics**

Before the hypothesis in this study is tested, prerequisite tests are first carried out which in this case are the data normality test and the data homogeneity test, which are as follows:

*a. Normality Testing*

*i. Speaking*

With the results from Kolmogorov-Smirnov with a score of 0.200 as the result of the Sig for the Pre-test and for the Post-test results with a significance (Sig.) value of 0.164. Furthermore, for the control class of the Pre-test results with a significance (Sig.) value is 0.200 and for the significance (Sig.) post-test is 0.200. Based on the calculations, it can be concluded that the data obtained are normally distributed as in the table for calculating the normality test above. The result of normality test for pre-test and post-test of Experiment and control class can be seen on **Table 3**.

Table 3. Normality Testing of Speaking

| Class                | Kolmogrov-Smirnov |    |       | Shapiro-Wilk |    |       |
|----------------------|-------------------|----|-------|--------------|----|-------|
|                      | Statistic         | df | Sig.  | Statistic    | df | Sig.  |
| Pre-test Experiment  | 0.160             | 16 | 0.200 | 0.944        | 16 | 0.401 |
| Post-test Experiment | 0.182             | 16 | 0.164 | 0.917        | 16 | 0.152 |
| Pre-test Control     | 0.169             | 15 | 0.200 | 0.936        | 15 | 0.337 |
| Post-test Control    | 0.159             | 15 | 0.200 | 0.943        | 15 | 0.423 |

*ii. Listening*

With the results from Kolmogorov-Smirnov with a score of 0.200 as the result of the Sig for the Pre-test and for the Post-test results with a significance (Sig.) value of 0.190. Furthermore, for the control class of the Pre-test results with significance (Sig.) value is

0.010 and for the significance (Sig.) post-test is 0.007. Based on the calculations, it can be concluded that the data obtained are normally distributed as in the table for calculating the normality test above. The result of normality test for pre-test and post-test of Experiment and control class can be seen on **Table 4**.

Table 3. Normality Testing of Listening

| Class                | Kolmogrov-Smirnov |    |       | Shapiro-Wilk |    |       |
|----------------------|-------------------|----|-------|--------------|----|-------|
|                      | Statistic         | df | Sig.  | Statistic    | df | Sig.  |
| Pre-test Experiment  | 0.155             | 16 | .200* | 0.952        | 16 | 0.523 |
| Post-test Experiment | 0.034             | 16 | .190  | 0.921        | 16 | 0.175 |
| Pre-test Control     | 0.253             | 15 | .010  | 0.870        | 15 | 0.034 |
| Post-test Control    | 0.260             | 15 | .007  | 0.881        | 15 | 0.049 |

*b. Homogeneity*

The homogeneity test is intended to determine whether the sample from the population is homogeneous or not. Based on the output of the test of Homogeneity of variance above, it is known that the significance value (sig.) of the 2nd semester C student test results in the Experiment class and Control class is 0.687 for the listening and for the speaking 0.807, because the value of sig. 0.687 > 0.005 for the speaking, and 0.807 > 0.005 for the listening then as the basis for decision making in the homogeneity test above, it can be concluded that the data variance from the results of the learning trial using the Duolingo application for the Experiment class and Control class is the same or homogeneous.

Table 5. Results of test homogeneity of variances

| a. Speaking      |     |     |       |
|------------------|-----|-----|-------|
| Levene Statistic | df1 | df2 | Sig.  |
| 0.166            | 1   | 29  | 0.687 |
| b. Listening     |     |     |       |
| Levene Statistic | df1 | df2 | Sig.  |
| .061             | 1   | 30  | 0.807 |

The results of the homogeneity test are carried out by determining the results of the T-test and ANOVA to determine whether the results will be homogeneous or not. The data of homogeneity analysis is on **Table 5**.

### 3. T-test Analysis

#### a. speaking

The results of the T-test analysis in **Table 6**. That table explains that the mean score of the experimental class with a sample size of 16 people is 88.63 with a standard (Std.) deviation of 3.030, which has a standard (Std.) error of 0.758. while the control class, which consisted of 15 people, had a mean score of 80.53, with a standard (Std.) deviation of 3,563 which had a standard (Std.) error of 0.920.

Table 6. Results of T-test group statistic

| a. Speaking      |    |       |                |                 |  |
|------------------|----|-------|----------------|-----------------|--|
| Class            | N  | Mean  | Std. Deviation | Std. Error Mean |  |
| Experiment Class | 16 | 88.63 | 3.030          | 0.758           |  |
| Control Class    | 15 | 80.53 | 3.563          | 0.920           |  |

| b. Listening     |    |       |                |                 |  |
|------------------|----|-------|----------------|-----------------|--|
| Class            | N  | Mean  | Std. Deviation | Std. Error Mean |  |
| Experiment Class | 16 | 75.38 | 5.632          | 1.408           |  |
| Control Class    | 15 | 52.13 | 8.501          | 2.195           |  |

#### b. Listening

The results of the T-test analysis in Table 6. That table explains that the mean score of the experimental class with a sample size of 16 people is 75.38 with a standard (Std.) deviation of 5.632, which has a standard (Std.) error of 1.408. while the control class, which consisted of 15 people, had a mean score of 52.13, with a standard (Std.) deviation of 8.501 which had a standard (Std.) error of 2.195.

### 4. One Way ANOVA Analysis

The results of ANOVA in **Table 7**. The results of the analysis showed that the score

of Within Groups was greater than Between Groups, which meant that the intervention had a different effect on the two groups. Then with the results of the table significance (Sig.) obtained P (P-value) = 0.000. So the results of this study are in accordance with the research hypothesis which shows the effect of the Duolingo application on improving students' speaking and listening skills. This effect can be seen from the difference in pre-test and post-test scores between the control and experimental groups, because that have a significant difference with the value of significance (Sig.)  $0.000 < 0.05$ .

Table 7. Result of ANOVA

| a. Speaking    |                |    |             |        |       |
|----------------|----------------|----|-------------|--------|-------|
|                | Sum of Squares | df | Mean Square | F      | Sig.  |
| Between Groups | 506.904        | 1  | 506.904     | 46.596 | 0.000 |
| Within Groups  | 315.483        | 29 | 10.879      |        |       |
| Total          | 822.387        | 30 |             |        |       |

| b. Listening   |                |    |             |        |       |
|----------------|----------------|----|-------------|--------|-------|
|                | Sum of Squares | df | Mean Square | F      | Sig.  |
| Between Groups | 4182.001       | 1  | 4182.001    | 82.532 | 0.000 |
| Within Groups  | 1487.483       | 29 | 51.293      |        |       |
| Total          | 5669.484       | 30 |             |        |       |

Based on these results, then  $H_0$  is rejected and  $H_a$  is accepted. That is, there is a significant level between the difference in the pre-test and post-test scores of the experimental group. So it can be concluded that there is a positive influence in the use of the Duolingo application on the speaking and listening abilities of students in semester 2C for the Experiment class at Hamzanwadi University, English education study program for the academic year 2022-2023.

Learning activities using the Duolingo application provide students with individual opportunities to develop their ability to explore

knowledge in English. Speaking, listening, writing, reading, etc. Such behavior is a medium of education and training for students to be creative and confident in communicating with others through newly acquired vocabulary and consistent real-world applications. This research relevant with Rofdinal's research (2021) entitled *The Effectiveness of Using Duolingo in Learning English Vocabulary*. In this study, the research that will be studied by researchers has something in common, namely they both take this research using a quasi-experimental study of two groups, the experimental group and the control group. The quasi-experimental design focuses on treatment and outcome, so data will be taken from the pre-test and post-test to find out whether there are significant results using the Duolingo application in vocabulary learning.

However, this research with future research does not take the same research focus. This study takes vocabulary as the dependent variable, while this study focuses on speaking ability as the dependent variable to be studied. However, the independent variables both use the Duolingo application as a learning medium. Although the time and place of the research carried out was different and the method of data collection was also different. The second study was conducted by Siti Niah at 2019 under the title "The Utilization of Duolingo to Improve the Speaking and Listening Skills of Junior High School Students in Pekanbaru." This research aims to find out the effectiveness of using duolingo application to improve students' speaking and listening skills. The research was carried out at SMP IT ALHafit Pekanbaru involving 58 students in the 8th Grade as the research sample. This study uses quantitative research methods with the ASSURE model (Analyze, State, Select, Utilize, Require, and Evaluate). This demonstrates that the use of duolingo to improve speaking and listening skills in junior high school students is proven to be effective.

Furthermore, the researcher intended to try the Duolingo application to enhance

students' speaking and listening skills, but with a different object of research, in which this study uses the second semester of Hamzanwadi University. Then this research is a quantitative study using a quasi-experimental method. However, in this study, researchers used purposive sampling as a data collection technique.

In the learning process using the Duolingo application, students not only listen to what is explained by the researcher, but students are directly involved in answering all the questions in the application and are required to complete all the units in the application, to be able to move on to the next unit that has different difficulties. In this study, the researcher gave questions to each group of students orally and answered directly by the students at that time. Learning in the control and experimental classes in the initial step, direct research provides pre-test questions that will be answered by each group, without any explanation of the questions given previously and will be directly answered by students according to their knowledge.

In the experimental class using the Duolingo application, students need to be more active in teaching and learning activities when they solve problems on their own. Researchers only function as moderators, mediators, and professionals. With such conditions, students will be more independent and try to answer all questions on the application, by consulting or asking researchers regarding things they do not understand. Likewise, researchers will quickly provide answers and always monitor student progress in the experimental class. With the tests given, the results of the analysis of the questions in the experimental class were more and the control class was still low. The success of students using the Duolingo application as a learning medium is demonstrated by the ability of students to answer questions and students become confident, creative, show initiative in answering, show high self-confidence, and are able to explore the opportunities provided quite well.

## Conclusion

The conclusion is it can be said that the learning outcomes using the Duolingo application are more effective, when compared with learning that does not use the Duolingo application. Because students use the Duolingo application as a medium of learning, students are able to answer all the questions given with high confidence, and are able to explore the opportunities provided quite well. Therefore, learning using the Duolingo application needs to be done and tried by students or for those who need to improve their English skills, because it can make students more active and confident in speaking and listening when expressing their expressions, as well as improve student achievement.

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