

THE INFLUENCE OF DUOLINGO GAMIFICATION APPLICATION TO FACILITATE STUDENTS' LISTENING COMPREHENSION: A PRE-EXPERIMENTAL STUDY

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Abstract

This research explores the effectiveness of gamification, specifically the Duolingo application, in improving students' listening comprehension skills at MAN 4 Tasikmalaya. The research is driven by the increasing digital engagement among students, particularly their attraction to mobile applications and online games. It investigates how such platforms can be harnessed for educational purposes. In the pre-experimental method as a quantitative research design, the research involved 30 tenth-grade students who were assessed using pre-tests and post-tests to evaluate the impact of gamification on their listening comprehension. The research instruments included a pre-test and a post-test, each containing 20 multiple-choice questions. The lowest score on the pre-test was 30, and the highest was 65, with a mean score of 52.67; the lowest score on the post-test was 50, and the highest was still 65, with a mean score of 62.00. The mean increased from 52.67 to 62.00. The research findings indicate a significant improvement in students' listening comprehension after being exposed to gamified learning through Duolingo, suggesting a positive relation between the use of gamification and listening skills enhancement, with a correlation paired t-test value of 0.746, which indicates a strong correlation between the pre-test and post-test, and a paired t-test significance value of $0.000 > 0.05$. The research concludes that Duolingo, as a gamified language learning tool, is effective in fostering engagement and enhancing students' overall listening comprehension in English. The results of the research recommend that teachers can use the Duolingo application as a learning medium to train listening comprehension.

Keywords: Listening Comprehension, Duolingo, Language Learning, Digital Learning Media

INTRODUCTION

As cited by Syafii et al. (2020), listening is one of the most important skills in learning a language to get a better understanding of the language. Listening skills are one of the skills that help students accurately understand information when communicating with others. These skills are an important part of effective communication in the workplace. Good listening habits will help to understand information, interpret messages correctly, and make conversations and communication more efficient. Difficulties in teaching listening to students can occur due to the teaching system, administration, or even curriculum (Çapan,

2021).

Along with time, the use of the internet is increasingly sophisticated, and all of life depends on technology. One of the impacts of technology is the internet; the extensive use of the internet must have a huge impact on a person's life, especially for a student. Games are one form of implementation of technology and the internet, which is currently very popular with various ages (Andriani, 2022). The use of games is not only for entertainment; there are many negative impacts generated by playing games. Online game addiction causes adolescents to skip class and spend time in front of computers rather than books, resulting in decreased teenage learning achievement and disrupted school activities (Zendrato & Harefa, 2022).

Dependence on online games harms students' learning motivation. In games, there is a listening section that students can learn from. However, sometimes there are misunderstandings about the words that students get from the game. Not only that, sometimes wrong pronunciation becomes a problem because students hear what they are saying without thinking about how to pronounce it correctly. The listening process and the way speakers employ words with listeners are greatly influenced by unfamiliar terminology (Underwood, 1989, referenced in Alzamil & Jwahir, 2021).

Children who are already addicted to online games will reduce their motivation to learn, causing a decrease in their learning achievement. Based on that statement, they will lose their motivation to learn, one of which is that students become too lazy to learn and focus too much on playing games. However, the use of games can also help students to encourage enthusiasm and creativity in learning, especially language learning (Sasmitha & Thamrin, 2022). By using games, students will channel their hobbies and creativity in the same way as playing games. As an alternative, learning services must be provided whenever and wherever possible.

Along with the development of digital technology, language teaching can change the way teachers teach, as well as the media used, especially in teaching the English language. English has taken center stage as the most crucial language for global communication in the era of rapidly evolving globalization (Haryadi & Aminuddin, 2023). This language serves as both a portal that provides access to a larger world and a tool for communication. Understanding and being proficient in English are no longer simply extra skills (Haryadi & Aminuddin, 2023). Using gamification can help language learning students become more creative and motivated to learn languages. Several techniques exist to upgrade the ability to listen effectively through something fun, such as using games, facilitating students to improve their listening skills by using students' interests, and using games will improve their listening comprehension.

According to Donmuş and Gürol (2015), using educational game applications in learning languages will increase students' motivation to be enthusiastic about learning languages. Based on that statement, the use of gamification in learning can make students feel happy and not bored when learning languages. Also, gamification would be very beneficial for teachers to use in the classroom (Sukarya et al., 2022)

This research aimed to facilitate students using gamification to improve listening comprehension at MAN 4 Tasikmalaya in Tasikmalaya. It is often found that students are addicted to playing games and forget their obligations to study, and sometimes forget to do their school assignments. This happens because nowadays mobile phones are something important in life, even in learning activities; therefore, by utilizing technology and paying attention to the needs of the students. Based on the objective above, the expected output from using the Duolingo application to facilitate students to improve listening comprehension is

the addition of vocabulary in the English language that can be obtained from the application, and being able to pronounce words in English properly, or students can improve their listening comprehension.

METHOD

This research employed a quantitative methodology utilizing a pre-experimental design, which involves the analysis of numerical data. The methodical study of phenomena through the collection of numerical data and the use of statistical, mathematical, or computational techniques is known as quantitative research. According to Creswell (2015), an inquiry into a social or human issue that relies on testing a theory composed of variables to determine whether the theory's expected generalizations materialize is known as quantitative research. The theory is assessed by statistical procedures and quantified through numerical measurements.

This research aims to understand the relationship between students and improve listening comprehension through the gamification of the Duolingo application. The research method employed in this study is a pre-experimental design. According to Frey (2018), a pre-experimental design determines if a treatment can foster development after it has been administered by evaluating participants or communities using a pre-experimental scheme design. To find out how students' listening comprehension is before and after using the Duolingo gamification application. This research employed a pre-experimental one-group design using a pre-test and post-test approach. One class of tenth-grade students from MAN 4 Tasikmalaya makes up the population.

Based on Creswell (2015), the sample is a part of the population that the researcher intends to examine to conclude the target population. The sample of this research is 30 participants from the 10th Grade. The researcher used simple random sampling for this research, where the students were randomly selected (Fraenkel & Wallen, 2012). Of the 174 students, 30 were selected as the sample.

The data collection techniques were carried out using a pre-test and a post-test. This research used pre-test and post-test instruments to investigate Duolingo to improve students' listening comprehension. Creswell and Creswell (2017) states that a pre-test measures characteristics that can be assessed for participants before giving a treatment. In other words, a post-test measures some characteristics of participants after giving treatment.

Accordingly, a test is a data collection technique to measure the presence or absence of the basic abilities and achievements of the object being studied (Arikunto, 2010). Researchers used two parts of the test; the pre-test was conducted before giving the material to see the initial ability, and the post-test was conducted after giving the material to see the improvement in students' listening comprehension ability.

The procedures for collecting data that the researcher used are pre-test, treatment, and post-test. The pre-test was administered to assess the students' listening comprehension ability before the treatment was implemented. In this research, the researcher employed traditional methods, such as providing materials via PPT or textbooks. While listening, students should focus on new vocabulary and how to pronounce the words correctly. The test was run for 45 minutes. This test will be conducted with 20 multiple-choice questions with various levels of questions, including 7 Easy, 7 Medium, and 6 Difficult.

After the pre-test is finished, the students will be treated using the Duolingo app's gamification. The treatment will take four meetings, with 90 minutes in each meeting. In different meetings, the researcher will use other kinds of games, but still use the Duolingo app to keep students from getting bored with one game. The game includes features such as listening using the conversation or the sound of the words.

The researcher will give the post-test to determine the effectiveness of using gamification by the Duolingo app as the treatment by comparing the results of the pre-test and post-test to see the improvement of students' listening comprehension. The researcher will use the gamification approach with the Duolingo app, which is played on their phone. While listening, students should focus on new vocabulary and how to pronounce the words correctly; the questions of the post-test are the same as those of the pre-test.

The research instrument, in the form of 20 multiple-choice questions, both pre-test and post-test, has been tested using SPSS V.23 to determine validity and reliability (Cronbach's Alpha). Furthermore, statistical data analysis shows students' listening skills; a normality test using Kolmogorov-Smirnov was conducted because, with Shapiro-Wilk, the data were not normal; and hypothesis testing using a paired t-test was done to see whether students' listening comprehension increases after being given treatment using the Duolingo gamification application.

FINDINGS AND DISCUSSION

This section presents the findings of a quantitative study that answers the two research questions. The first question addresses students' listening comprehension before using the Duolingo gamification application. The second question focuses on students' listening comprehension after using the Duolingo gamification application. The present research employs a quantitative and a pre-experimental approach, utilizing pre-tests and post-tests as research instruments.

1. Students' listening comprehension before using Duolingo

Before administering the pre-test to the participants, the researcher conducted the test in a different class of the same grade X B2 to validate the instruments. As the first activity before doing the treatment, the students took the pre-test to assess their listening ability.

The students took the pre-test on Wednesday, April 23rd, 2025. A pre-test was designed to determine how well students' listening comprehension was before being given treatment. The pre-test consists of 20 multiple-choice questions and lasts for 45 minutes.

Table 1. Pre-Test Statistical Calculation

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
PreTest	30	30	65	52.67	8.683
Valid N (listwise)	30				

Table 1 demonstrates the results of descriptive analysis of the pre-test scores of 30 students in the X 1A class before using the Duolingo gamification application using SPSS version 23. Based on the table above, the highest score of 30 students before using the Duolingo gamification application is 65, and the lowest score is 30. Meanwhile, the standard deviation is 8.683, and the average value is 52.67.

2. Treatment

After giving students a pre-test, the next step is giving treatments to students. Treatments were conducted in four sessions, starting from 28th April to 8th May 2025, and all the sessions used the Duolingo Gamification Application as a learning medium. In the pre-test meetings, the researcher provided information about the Duolingo Gamification Application used as a learning medium in the treatment process.

The first treatment was conducted on Monday, 28th April 2025. This meeting involved three learning activity sessions, including opening, main activity, and closing activity. The

main activity began with the teacher giving a short explanation about the material for today's activity. After that, the teacher asked the students to create an account. After successfully creating an account, students were asked to join the virtual class that the teacher had already provided by entering the code. After successfully entering the virtual class, students can begin to play the game on the Duolingo application. After students played the game on the app, the teacher asked students to come forward to report vocabulary and the pronunciation of the words that students got on the app.

The second treatment was conducted on Thursday, 1st May 2025. This meeting was similar to the previous meeting, which involved three learning activity sessions, including an opening activity, main activity, and closing activity. In the main activity, students continued to play the game on the Duolingo application. After that, if students had already learned their new vocabulary and the pronunciation of the words, one by one, they came forward to report their new vocabulary and the pronunciation of the words. After all the students have finished their reports, the teacher gave a task for students to complete in the classroom using the Duolingo application.

The third treatment was held on Monday, 5th May 2025. This meeting was similar to the previous one, which included three learning activity sessions: opening session, main session, and closing session. The main activity began with the teacher giving a short explanation of the material for today's activity. Students began by opening their phones and going through the Duolingo application to learn the material. Then, after students had learned the new vocabulary and pronunciation of the words, students came forward to report it.

The last treatment was conducted on Thursday, 8th May 2024. This meeting was similar to the previous meeting, which involved three learning activity sessions, including an opening activity, main activity, and closing activity. In the main activity, students continued to learn vocabulary and the pronunciation of the words about the material on the Duolingo app. Then, after students had already learned their new vocabulary and pronunciation. Students came forward to the teacher to report their achievements.

3. Students' listening comprehension after using Duolingo

After administering the pre-test and treatment, the researcher administered the post-test for the final examination. This section explains students' listening comprehension after using the Duolingo Gamification application. The treatment using the Duolingo Gamification application was given first to students before administering the post-test. Treatments were given four times, and they were expected to improve their listening comprehension.

After implementing treatments that took place in four meetings, the researcher gave a post-test to students. The post-test was administered to 30 students in class X A1 on Wednesday, 14th May 2025. The post-test was designed to determine how well students' listening comprehension improved after being given treatment. In the post-test process, the researcher gave the same questions in a different order. There were 20 multiple-choice questions that students had to answer independently in 45 minutes. These questions were tested for validity and reliability before being given to students. The post-test aims to determine students' listening comprehension after using the Duolingo application as a learning medium.

Based on the results, all 30 students get high scores with the following classifications: 24 students get good scores, and 6 students get fair scores. This means students' listening comprehension improves after they receive some treatment.

Table 3. Descriptive Statistics of Post-test

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Posttest	30	50	65	62.00	4.472
Valid N (listwise)	30				

Table 3 above shows the descriptive statistics calculation of the students' post-test scores, including minimum score, maximum score, mean, and standard deviation. From the table, the number of participants (N) is 30 students; the highest score on the post-test was 65, and the lowest was 50, with a mean score of 62.00 and a standard deviation of 4.472. It indicates that with a mean score of 62.00, students' listening comprehension improved after they received treatments using the Duolingo application.

4. Improvement in students' listening comprehension before and after using Duolingo

This section aims to answer the second research question: "What is the correlation between using gamification and students' listening comprehension?" The post-test results were compared to the pre-test to identify whether or not there was a correlation between using the gamification Duolingo application and students' listening comprehension after treatment. The data were statistically analyzed through SPSS 23, which included descriptive statistics, normality test, homogeneity test, hypothesis test, and correlation test results.

5. Normality Test

The normality test aims to determine whether or not the data collected is normally distributed. Shapiro-Wilk is used to measure data normality because the participants in this study were only 30 students, which means they were less than 50 if the Shapiro-Wilk significance value Sig. (2-tailed) is more than 0.05. It means the data are normal.

Table 4. The Normality Test using Shapiro-Wilk

Tests of Normality ^a						
		Kolmogorov-Smirnov ^b			Shapiro-Wilk	
		Statistic	df	Sig.	Statistic	Sig.
→	pretest	.300	5	.161	.883	.325
	60	.367	5	.026	.684	.006
	65	.245	19	.004	.883	.024

a. pretest is constant when posttest = 50. It has been omitted.

b. Lilliefors Significance Correction

Based on the table above, the significance value Sig. (2-tailed) is lower than 0.05. That means the data is not normally distributed. Because of that, the researcher performed the normality test again using Kolmogorov-Smirnov.

The test shows that the Kolmogorov-Smirnov significance value Sig. (2-tailed) of both the pre-test and post-test is 0.125, which means it is more than 0.05, so the data are normally distributed.

6. Homogeneity Test

To ascertain how similar the pre-test and post-test were, this study employed a homogeneity test. Researchers tested homogeneity using SPSS 23. The test's significance level needs to be higher than 0.05 in order to provide homogeneous results.

Table 6. The Homogeneity Test Result

Test of Homogeneity of Variances			
Pretest			
Levene Statistic	df1	df2	Sig.
3.232	2	26	.056

Table 6 shows that, based on the calculation results above, the p-value (Sig.) for homogeneity is 0.056. Since the p-value (Sig.) is higher than the 5% significance level of $\alpha = 5\%$ ($0.000 < 0.05$), this indicates that the variance between the pre-test and post-test scores is homogeneous.

7. Hypothesis Test

Hypothesis tests were carried out to see whether students' listening comprehension improved after treatment using the gamification Duolingo application.

Hypothesis test:

1) H₀ (Null Hypothesis): If the significance value (Sig. 2-tailed) is greater than 0.05, then there is no significant difference between the pre-test and post-test scores. This means that the use of the Duolingo gamification application does not improve students' listening comprehension.

2) H_a (Alternative Hypothesis): If the significance value (Sig. 2-tailed) is less than 0.05, then there is a significant difference between the pre-test and post-test scores. This means that the use of the Duolingo gamification application improves students' listening comprehension.

8. Paired T-test

Using SPSS version 23, a paired t-test was performed because the pre-test and post-test data distributions were normal. The paired t-test is a parametric test that can be used to compare two distinct statistics from two paired samples, according to Fiandini et al. (2024). Typically, interval or ratio-scaled data (quantitative data) are used for paired sample t-tests. To compare the students' listening comprehension before and after the treatment, the pre-test and post-test data were examined.

Table 7. Paired Sample Statistics

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	52.67	30	8.683	1.585
	Posttest	62.00	30	4.472	.816

Table 7 shows the results of descriptive statistics. The mean score of the pre-test is 52.67 with a standard deviation of 8.683, while the mean of the post-test score is 62.00 with a standard deviation of 4.472. This indicates an increase in value after the treatment was given.

Table 8. Paired Samples Correlations

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Pretest & Posttest	30	.746	.000

Based on Table 8 above, there is a correlation between the pre-test and post-test scores of 0.746. This value indicates that the relationship between the two scores is quite strong. With a significance value of 0.000, the relationship is also statistically significant because it is lower than the significance limit of 0.05.

Table 9. Paired Samples Statistics

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest - Posttest	-9.333	6.121	1.118	-11.619	-7.048	-8.351	29	.0000000033

According to the result of the table above, the Sig. (2-tailed) The value is 0.000, which is lower than the significance level of 0.05. This shows that there is a statistically significant difference between the pre-test and post-test values. Thus, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_a) is accepted. This means that the use of the Duolingo gamification application has a significant effect on increasing students' listening comprehension of senior high school students.

The significance value obtained ($p = 0.000$) shows that the intervention in this example, incorporating the Duolingo Gamification application into the learning process, is what caused the students' listening comprehension performance to increase, not chance.

Accordingly, this research is intended to improve students' listening comprehension by utilizing the Duolingo gamification application at MAN 4 Tasikmalaya. This study employed a quantitative approach with a pre-experimental research design. In collecting the data, the researcher used a pre-test and a post-test. The participants of this research were 30 students from X 1 A at MAN 4 Tasikmalaya for the 2025/2026 academic year.

After the data had been collected and analyzed using SPSS V.23 in the previous findings, this discussion presents the data analysis results to answer the two research questions: First, what is the students' listening comprehension before learning through gamification? Second, what is the correlation between using gamification and students' listening comprehension?

A pre-test was conducted to determine the students' listening ability before they received treatment using the Duolingo gamification application. 20 multiple-choice questions were delivered, and students had to answer all questions individually in 45 minutes. The students' pre-test results ranged from a low score of 30 to a high score of 65, with a mean score of 52,67. This indicates that most students have a low score on the pre-test and could not fulfill the minimum score requirements. Thus, students had poor listening ability before receiving treatments and needed appropriate teaching media to help them improve their listening ability.

Following the issue that the majority of students got a low score on the previous pre-test, this suggests that they need a lot of practice, and the teacher needs to support them with appropriate teaching media. Adriani et al. (2022) define teaching media as a tool that teachers use to enhance the quality of teaching, making it more effective and efficient. Additionally, learning media aims to capture attention and encourage students' motivation throughout the learning process.

As a result, the researcher applied the gamification mobile application Duolingo as an appropriate teaching medium to support students' listening comprehension. The researcher held four meetings for the treatment process, where students actively participated and showed a positive attitude toward teaching and learning using the Duolingo gamification application. As stated by Thamrin (2022), Duolingo is a well-known language learning program that may assist users in improving their proficiency and is seen to be useful for fostering foreign language proficiency.

To identify the improvement in students' listening comprehension before and after using the Duolingo gamification application. Statistically, the pre-test results and post-test results were compared. The mean pre-test score was 52,67, while 62.00 was the mean of

the post-test score. The result showed an improvement in students' scores of 9,33 from the pre-test to the post-test result. The paired sample t-test calculated the final hypothesis, where H_a was accepted, and H_0 was rejected because of the significance. (2-tailed) $0.000 < 0.05$, which indicates improvement in students' listening comprehension before and after using the Duolingo gamification application. Before conducting a correlation test for the final hypothesis, it is important to test the normality of the data first. As mentioned by Sugiyono (2018), the normality test determines whether or not the sample being studied is normally distributed. The researcher used Kolmogorov-Smirnov to test the normality of the data. The result shows that the pre-test and post-test have a significant value greater than 0.05, which is 0.125, which means that the data are normally distributed. In addition, the homogeneity test shows that the data sample is homogeneous since sig. value $0.056 < 0.05$.

Furthermore, the correlation of the paired sample t-test score was 0.746, indicating a strong positive correlation between the pretest and posttest results, and we can also see in Sig. (2-tailed) is 0.000, which means less than 0.05. This indicates that there is a strong and significant positive impact between pre-test and post-test scores. This means the use of the Duolingo gamification application can improve students' listening comprehension.

CONCLUSION

The conclusions of this study are based on two main questions: EFL students' perceptions of the use of Instagram captions as reading material in Extensive Reading, and the factors that influence them. In general, students showed positive perceptions. From a cognitive aspect, Instagram captions helped reading comprehension, enriched vocabulary, and provided authentic English exposure. From an affective aspect, students felt comfortable, interested, and motivated because the topics matched their interests and ability levels. From a conative aspect, they showed a desire to read continuously because they felt they received direct benefits in the form of new information and improved language skills. Furthermore, these perceptions were influenced by internal factors (experience, motivation, psychological state, and attention) and external factors (clarity of caption content and digital environment). Thus, Instagram can be an effective and enjoyable reading alternative in Extensive Reading activities.

This research aims to investigate the impact and improvement of students' listening comprehension using the Duolingo gamification application. Based on the previous findings, this research indicates that the implementation of the Duolingo gamification application improved students' listening comprehension of X 1 A students at MAN 4 Tasikmalaya.

The pre-test result revealed that students' scores had a mean score of 52.67 with a standard deviation of 8.683, whereas students' minimum scores were 30 and maximum scores were 65. This indicates that some students' scores are in the low category before being taught using the Duolingo gamification application, which means that students lack listening ability.

The post-test results revealed that students' scores had a mean score of 62.00 with a standard deviation of 4.472, whereas the minimum score is 50 and the maximum score is 65. The results show that almost all students' scores are in a good category after being taught using the Duolingo gamification application, which means that students' listening comprehension has improved.

In conclusion, the findings from the statistical data analysis indicate that there is a significant relationship in the listening comprehension of students in class X 1 A before and after the implementation of the Duolingo gamification application. The data clearly

demonstrate an improvement in students' performance, suggesting that the use of Duolingo contributes positively to the development of listening skills. Duolingo, as a gamified learning platform, provides interactive exercises, instant feedback, and reward systems that stimulate learners to practice consistently and with greater enthusiasm.

Therefore, it can be concluded that the Duolingo gamification application is an effective and innovative medium for teaching English, particularly in enhancing students' listening comprehension. This study provides valuable insight for educators, suggesting that integrating technology-based learning tools can significantly improve learning outcomes in language education. Future research is encouraged to explore the long-term effects of gamified applications and their potential not only for listening but also in other language skill areas such as speaking, reading, and writing.

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