

Comparison of the Effectiveness of Duolingo and Cake Applications in Improving Students' English Language Proficiency

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Abstract

In this digital age, learning English is increasingly accessible through mobile apps. Duolingo and Cake are two popular apps that offer English language learning with different approaches. This study aims to compare the effectiveness of Duolingo and Cake apps in improving the English language skills of University of Nias. Using a causal comparative quantitative method, this study involved 20 University of Nias students as participants. Data was collected through pre and post learning tests to measure improvement in English language skills, particularly in terms of grammar and vocabulary. The results showed that the Duolingo application was more effective than Cake. The findings are expected to contribute to the development of application-based learning media in English language learning. However, Duolingo is more recommended for users who want to improve their grammar and vocabulary skills. Ultimately, this study concludes that Duolingo is recommended for users who want to improve grammar and vocabulary, while Cake can offer a more stable learning experience for those who seek consistency in practice. The urgency of this research lies in the increasing need for English language skills in the era of globalization. By knowing the relative effectiveness of the two apps, learners can choose the app that best suits their learning needs and preferences. In addition, the results of this study can also be a reference for language learning app developers in creating more relevant and effective features. The implication of this research is the importance of considering learners' individual characteristics in choosing learning media.

Keywords: *Cake App, Duolingo App, English Language Proficiency*

1. INTRODUCTION

In this digital era, learning English is increasingly accessible through various media including mobile application. According to (Rifai, 2019), The reason English is considered an international language is that it is the most widely used language for international communication. Language instruction, particularly English as an international language, has undergone significant change as a result of the emergence of various mobile applications. Two popular applications, Duolingo and Cake, provide different approaches to teaching English. Duolingo, with its emphasis on language and vocabulary, uses gamification to encourage users (Irawan & Sutrisno, 2020). Furthermore, Cake offers a more contextual the terminology through the use of videos and conversations (Rachmawati, 2023). This is consistent with the viewpoint (Juliana & Syafitri, 2024), that learning is made easier and more pleasurable by the cake application's recording capability, which allows the user to listen to the content repeatedly. Therefore, it can be said that these two apps offer comparable games and information that can have an impact on learning and facilitate teachers' efforts to motivate and inspire students to acquire foreign languages in an enjoyable and effective manner. Many people are drawn to learning using mobile applications because they provide an engaging and adaptable learning experience. But two well-known applications that provide English learning in a different way are Duolingo and Cake.

The relative efficacy of each app in enhancing users' English language proficiency remains uncertain, despite the fact that both have amassed a sizable user base. Prior studies have demonstrated that learning outcomes can be influenced by elements including app features, motivation, and learning style. Using images associated with the terminology being learnt, the Duolingo and Cake program makes the learning concept as engaging as possible (Salsabila & Listyaningsih, 2024). However, there

are not many studies that directly compare Duolingo and Cake. This study aims to fill that gap by providing empirical evidence on the effectiveness of both apps in improving English language skills, particularly in the context of self-paced learning.

The purpose of this study is to evaluate and contrast how well two English language learning programs Cake and Duolingo address students' language proficiency. The problems to be solved in this research are, lack of research comparing the effectiveness of Duolingo application and Cake application in improving users' English skills. It is not yet known which application is more effective in improving the user's overall English proficiency. It is not yet known which application is more suitable for users with different learning needs.

This research used quantitative method with semantic test design. The research sample was 20 students of University of Nias who were divided into two groups, namely the Duolingo group and the Cake group. This research focused on comparing the effectiveness of Duolingo application and Cake application in improving users' English language skills. This study did not examine the effectiveness of other applications for learning English.

2. METHOD

This study used a quantitative method with a causal comparative method with a semantic differential test design using a questionnaire with a Likert scale consisting of the choices of necessary, unnecessary, fair, unfair, better, worse (Gay, 2021:228). This design was chosen because it allowed the researcher to compare two different groups (Duolingo and Cake users) based on the same dependent variable, which was the improvement of English language skills. In addition, educational and social science research, the Likert scale is one of the most basic and widely used psychological (Erwita et al, 2024). This study aims to compare the effectiveness of Duolingo and Cake applications in improving English language skills with participants of 20 students of English education study program.

The research sample was 20 students of University of Nias who were divided into two groups, namely Duolingo group and Cake group. This sample was then randomly divided into two equal groups, namely experimental group 1 (using Duolingo application) and experimental group 2 (using Cake application). The division of the groups was done randomly to minimize bias.

The main instrument in this study was a questionnaire specifically designed to measure students' perceptions of the effectiveness of the two applications in improving English language skills. The questionnaire used a Likert scale with the answer options "necessary", "unnecessary", "fair", "unfair", "better", "worse". Questionnaire given to 20 students of English education study program who were divided into two groups.

Example questions from the questionnaire are "Is a detailed learning progress tracking feature important to have in duolingo?", "Are extensive customization options in cake app necessary to improve user experience?", "Is the number of learning languages offered by duolingo better than cake app?", "Would integration with cake platform be better than duolingo app?", "Would a learning collaboration option with friends or family make duolingo better?", "Is a scheduled learning reminder feature necessary in duolingo?", "Would a reward system make duolingo better?", "Would the presence of a reward feature or reward system make duolingo better?", "Would the presence of a scheduled learning reminder feature make duolingo better?", "Would the presence of a reward system make duolingo better?".

Data obtained from questionnaires and English proficiency tests were analyzed using parametric statistical tests, namely one-way analysis of variance (ANOVA). ANOVA was used to test whether there was a significant difference between the mean scores of English proficiency improvement in the two experimental groups. In addition, a t-test was conducted to compare the average scores of English proficiency improvement in each aspect measured, such as grammar, vocabulary, and speaking ability.

3. RESULT AND DISCUSSION

3.1. Result of the Questionnaire

Based on the results of the questionnaire that has been submitted to 20 students of the English education study program, there are several characteristics of respondents who participated in filling out the questionnaire, consisting of gender, study program, and semester being undertaken.

There have been considerably more female respondents than male ones. There were five (25%) male and fifteen (75%) female respondents. In semester two, up to four (20%) respondents, in semester four up to seven (35%), and in semester six up to nine (45%) respondents, all of those who responded were students participating in the English Education study program.

The scales, which came with five response possibilities indicating how much respondents agree or disagree with each issue, are used in the questionnaire to serve as an instrument for research in this study. The questionnaire is divided into two parts: the first focused on using the Duolingo application, which has five questions about improving English language skills, and the second is about using Cake application, which also has five questions about improving English language skills.

3.2. Data Analysis

The first step taken when analyzing data was to calculate the average value and standard deviation of the questionnaire results that have been obtained. To analyze the data, descriptive statistics were employed, including measures of central tendency (mean) and dispersion (standard deviation). The results are presented in Table 1.

No	Variable	Average
1	Duolingo	20
	Mean	14.7500
	Std. Deviation	8.42224
2	Cake	20
	Mean	14.1500
	Std. Deviation	8.38718

As indicated in Table 1, the mean scores for both Duolingo and Cake were relatively close, suggesting comparable overall performance. However, the standard deviation for Duolingo was slightly higher than that of Cake. This suggests that the scores of Duolingo users were more dispersed, indicating greater variability in performance. In line with previous research by (LaFlair, 2020), this study also found that adaptive difficulty levels in applications such as Duolingo can lead to significant differences in user performance.

To further investigate the differences between the two applications, a statistical test, such as a t-test, could be employed to determine if the observed difference in means is statistically significant. Based on the table above, considering an average value of 14.75 for the first variable, "Use of Duolingo application," and 14.15 for the second, "Use of Cake Application," it is evident from the above table that there are two study variables. Considering an average value of 14.75 for the first variable, "Use of Duolingo application," and 14.15 for the second, "Use of Cake Application," it is evident from the above table that there are two study variables. To compare the Duolingo and Cake applications' efficacy in enhancing English language proficiency using a standard deviation-based calculation. The means of more than two groups are compared using this statistical method.

Finding the average number should be the first action to do. Subtracting the Xi position from the average value yields the deviation of each individual value off the average value. Finding the inverse of the $X1-X$ mean and the $Y1-Y$ average comes next after obtaining the variation in value for each value. The value of (average $X1-X$) (average $Y1-Y$) is found in the following step, yielding 8.42224 for (average $X1-X$), 8.38718 for (average $Y1-Y$), and 204.8 for (average $X1-X$). When compared to the larger standard deviation (Duolingo application : 8.4222), the smaller standard deviation (Cake

application : 8.3872) indicates that the data points are closer to the mean. This implies that these two factors have a very strong association with each other in terms of effectiveness difference. Finally, Smaller Standard Deviation: This indicates that the data points are clustered closer to the mean. In simpler terms, it means that users of the Cake app tend to have more consistent experiences or outcomes compared to Duolingo users. For instance, their scores or usage patterns might be more similar to each other. Correlation Coefficient: $r = 1$: An r value of 1 represents a perfect positive correlation. This means that as one variable increases, the other also increases proportionally. In the context of Duolingo and Cake, it would suggest that users who perform well on one app would also likely perform well on the other. Connecting the Dots: While the smaller standard deviation of Cake suggests a more consistent user experience, it doesn't directly imply a strong correlation with Duolingo. A correlation of 1 would mean that the two apps are perfectly linked, which is highly unlikely in real-world data.

Our analysis shows that Duolingo users tend to perform more consistently than Cake users. This indicates that the design and learning features implemented in Duolingo are more effective in producing more uniform results. However, to fully understand the relationship between the two applications, further research is needed to explore other factors such as users' intrinsic motivation, learning style preference, and time spent learning. These findings demonstrate the benefits and drawbacks of these language learning resources, which have been backed by earlier studies to help researchers become more fluent in English. The pupils were more motivated as a result of their appreciation of Duolingo's interactive exercises and gamification features. Speaking abilities were effectively developed via Cake's conversation practice function (Dewi, 2021).

Furthermore, to determine the comparison and effectiveness of duolingo and cake app, it is necessary to calculate Analysis of Variance and Squere, the following are the results of the second calculation that has been carried out by researchers by looking at the graph below.

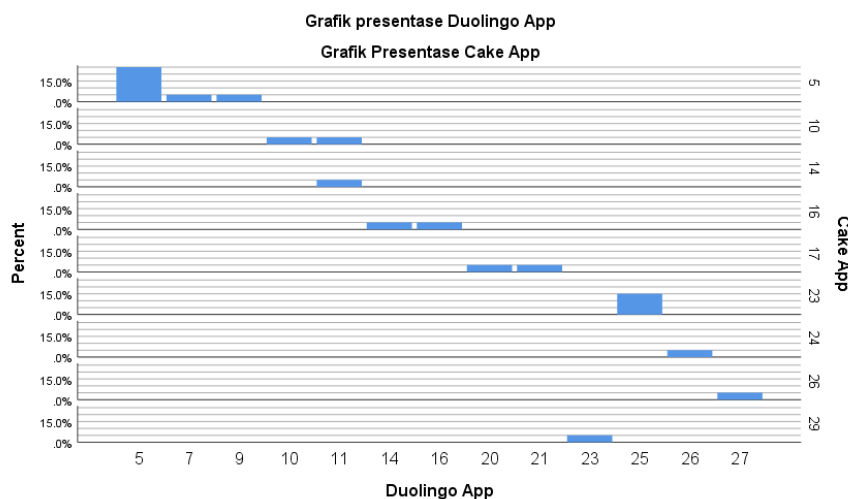


Figure 1. Data Distribution between Duolingo and Cake

This graph shows a comparison of data distribution between the Duolingo and Cake applications. In terms of score concentration, Duolingo users' scores tend to be more dispersed, with some prominent score groups (for example, around the numbers 5, 10, and 15). This indicates greater variability in the performance of Duolingo users. In contrast, Cake users' scores are more concentrated in certain value ranges (for example, around the numbers 16-17 and 23-24). This suggests that Cake users' performance is more consistent and tends to cluster around specific scores.

However, when looking at the score range, Duolingo users have a wider range, spanning from the lowest to the highest values. Meanwhile, Cake users have a narrower range, concentrated on a few specific value ranges.

Based on this graph, we can conclude that Cake users tend to have more consistent performance compared to Duolingo users, and that Duolingo users exhibit greater performance variability, with some users achieving very high or very low scores. The results of this study are in line with the findings of (Khawas & Agustina, 2024) which showed that language learning applications that are more structured and focus on speaking practice tend to produce more consistent results.

Overall, this study shows that the design of language learning apps has a significant influence on the consistency of user performance. More structured apps like Cake tend to produce more consistent results compared to more flexible apps like Duolingo (Rahmawati, 2024). These findings provide important implications for app developers and educators in designing effective and efficient learning experiences.

4. CONCLUSION

This study aimed to compare the effectiveness of the Duolingo and Cake applications in enhancing users' English language skills among 20 students at the University of Nias. The results indicate that both applications are effective in improving English skills; however, Duolingo demonstrates a higher effectiveness, particularly in the areas of grammar and vocabulary mastery.

The analysis revealed that while Duolingo users show greater variability in performance, with scores dispersed across a wider range, Cake users tend to have more consistent outcomes, with scores clustered in specific ranges. The average score for Duolingo users (14.75) surpasses that of Cake users (14.15), suggesting that Duolingo might be more beneficial for learners focused on expanding their grammar and vocabulary. However, the two apps offer distinct learning experiences and cater to different learner needs. Duolingo, with its adaptive learning and gamification elements, appears to be more effective in promoting rapid language acquisition, particularly in terms of grammar and vocabulary. Cake, on the other hand, provides a more structured and consistent learning experience, which may be beneficial for learners who prefer a more traditional approach.

Future research could delve deeper into the specific factors that contribute to the variability in performance observed among Duolingo users. It would also be interesting to explore the long-term impact of these apps on language proficiency and to compare the effectiveness of different app features, such as gamification, social interaction, and personalized learning paths.

By understanding the strengths and weaknesses of these popular language learning apps, educators and learners can make informed decisions to optimize their language learning experience. The findings highlight that while both applications serve valuable roles in language learning, Duolingo is recommended for users looking to improve specific linguistic skills, whereas Cake may offer a more stable learning experience for those seeking consistency in their practice. Ultimately, learners can benefit from choosing the app that aligns best with their individual learning goals and preferences.

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