The Effects of Using Duolingo Mobile Application on Students' English Pronunciation Skill

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Abstract

Pronunciation is generally considered a hindrance for Indonesian learners of English. In the pronunciation of vowel sounds, learners often find it challenging to distinguish short and long vowels. This research investigates the use of a prevalent mobile language learning application – Duolingo – to improve students' English pronunciation skills. In this study, we adopted a quantitative method with a quasi-experimental design. The pronunciation data were obtained from two groups of students, collected before and after treatments. As the data were analyzed statistically using the Mann-Whitney test on SPSS, it was found that the students who were treated with the Duolingo application scored higher (Mdn = 14) than those treated with a traditional drilling method (Mdn = 13). However, the difference was not significant, U= 78.00, p= 0.74. Therefore, the Null Hypothesis (H$_0$) was accepted as the use of Duolingo did not significantly improve the participants' pronunciation skill. The reasons for the unsuccessful effort were sought. First, the students might not be familiar with the application. Second, the use of the application did not enable collaborative learning and interaction. This study offers overarching implications for the use of ICTs in ELT. Teachers need to become aware of the students' levels of familiarity with ICTs before teaching English using technologies. In addition, using ICTs in the classroom should always enable collaborative learning and interaction.

Keywords: *Duolingo App, English pronunciation, short and long vowels.*

A. Introduction

One of the problems frequently faced by many English learners in Indonesia is pronunciation. There are several factors that affect this phenomenon. They are native language, age, exposure, innate phonetic ability, identity, and

language ego, motivation. Simatupang (2021) stated that in general Indonesian students have problems learning English pronunciation.

Based on anecdotal evidence that researchers found when conducting small research on pronunciation at a vocational high school. The researcher did not directly ask about pronunciation, but invited several students to talk about their problem in learning English. The difficulty in learning pronunciation faced by students at vocational high school, has problems in pronunciation exactly in short and long vowels. For examples from small research, the word "could" correctly students should pronounce /kəd/, but students pronounce /kold/. In other case, word "suit" correctly students should pronounce /suːt/, but students pronounce /suit/.

To help in students' pronunciation improvement in vocational high school, an alternative teaching method or perhaps needs to be employed. There are many strategies that can be used to improve students' English pronunciation ability. In this research, researchers attempt to use Duolingo mobile App as a medium to improve students' English pronunciation.

The preliminary study that found the Duolingo App does not significantly improve students' English pronunciation. However, the fact shows some research found that Duolingo App is a recommended app to increase speaking English ability. For example, the research of Mutaqin (2016) which found that it has an effect on students' speaking English. On the other hand, Fauziyah (2019) which found an effect to enhance speaking skill in VII MTS Cinsayag.

The objective of research focuses on short and long vowels. And how to know the effect of Duolingo App on students' English pronunciation skills. The results gave contribution in phonological studies and also the implementation of Duolingo Mobile App for media of ELT, especially in short and long vowels.

B. Literature Review

Understanding pronunciation is one of the basics of learning English. And good pronunciation can lead to learning why bad pronunciation makes it difficult in English learning Gilakjani (2012). English pronunciation is one of the difficult skills to get and learn for increasing their pronunciation. Pourhossein (2016) The small unit of language sounds.

Pronunciation sounds were produced. Not only refers to speech sounds in the mouth but also about stress the way sounds by hearing. Zielinski, B. & Yates (2014) stated the pronunciation is sounds that we use to make meaning in speech. It includes the particular consonants and vowels (segments), aspects of speech beyond the level of individual segments such as stress, timing, rhythm, intonation, and phrasing. And many aspects in pronunciation, but this research just focuses on single vowels (short and long).

Many aspects become a problem in pronunciation. According to Subandowo (2017) stated mother tongue is not only the one language that one learns from ones' mother but is used as the dominant speaker and home language.

According to Yule (2014, p. 3.3) in Ambalegin & Arianto (2018, p.113) stated: "Vowel sounds are produced with a relatively free flow of air, and they are all typically voiced". Kelly (2001) stated there are three categories of vowel sounds; close vowel, mid vowel, open vowel. Each vowel has a position to represent the pronunciation.

(Simarmata & Pardede, 2018) was stated, In English it has twelve vowels. There are: /ɪ:/, /ɪ/, /e/, /æ/, /ə/, /ɜ:/, /ʌ/, /ɑ:/, /ɒ/, /ɔ:/, /u:/, /ʊ/. And in vowels has two kinds in English. They are long vowels and short vowels. The long vowels /ɪ:/, /ɜ:/, /ɑ:/, /ɔ:/, /u:/, /ɪ:/, /ɜ:/, /ɑ:/, /ɔ:/, /u:/. And the short vowel like: /ɪ/, /e/, /ə/, /ʌ/, /ʊ/.

Duolingo is an application to learn English with the purpose of giving people a free education. Duolingo is a language learning app created by Luis Von and Severin Hacker in 2011 to give free education to the world Munday (2016).

Luis Von and Saverin Hacker are the founders of the website Duolingo App. Many languages can access the users, among them is the English language. As a digital application, Duolingo has the first assessment for users and can show the user's point. The scoring will get to the way for the next level or stick to the level. According to Settles and Hagiwara (2020) claims —the Duolingo English Test is a groundbreaking, digital-first, computer-adaptive English language proficiency test. Duolingo App has advantages and disadvantages.

The advantages are:

a. Duolingo has access to IOS, Android, or Windows Phone applications.

b. Many languages can be used in Duolingo.

c. Duolingo has many activities: students listen, transcribe, speak and translate into a simple interface as they work through words and phrases.

d. Students can balance the translation, listening, matching words, and speaking exercise.

e. Students can repeat their pronunciation until they pronounce the correct spelling.

The disadvantages are:

a. Duolingo uses a computerized voice system in a listening session, so students do not listen to the language.

b. The voice is dry and non-rhythmical.

c. The grammatical structures do not offer any explanation of part of its dashboard.

Based on learning activities that were done, researchers use Duolingo as teaching-learning media. There are some ways to use Duolingo Application:

1. Opening the lesson with regards.
2. Asking one student to guide and common prayer.
3. Checking the attendance list and calling the names' students one by one.
4. Giving interest motivates students.
5. Giving the students a chance to imagine what we will do in the Duolingo App.
6. Explaining about Duolingo Application and giving examples how to use Duolingo Application.
7. Inviting students to join the Duolingo class.
8. Give one assignment as an example and ask students to do the task (pronunciation session) in Duolingo Application.

Using Computer-Assisted Language Learning (CALL) gives many benefits for teachers, students, and EFL in learning English. Based on S. (2006) state the CALL method always used a middleman or media and thus was consistent with the use of computer and other media technologies. According to Levy and Stockwell (2013), learning English using CALL is the way by technology. It may also have an impact on the use of technology to operate the technology.

There is some previous research about Duolingo Mobile Application research. Alamudi (2018) in his research said about the effect of using the Duolingo App for English learning media on students. Her research just focuses on using Duolingo by Android. Learning programs make it easy for the media to invite students to use it. The result of the study is that Duolingo can have a big effect on students, exactly in learning English.

Another article, the research that uses Duolingo App also as the research media was written by Nuralie (2019) her research uses Duolingo App to focus on the relation between the application as a learning medium and learning self-reliance focused on the English communication ability.

C. Research Methodology

The research uses experimental design. According to Dornyei (2007) the concept of quantitative research is that reliability is very simple, but when researchers find validity, researchers can take the two parallel systems in quantitative research. In this research, I had examined the effect of the Duolingo App on English pronunciation.

1. Participants / Population and Sample

The respondents of this research are the 26 students of 11th grade in vocational high school. The 28 students were divided into two groups, 13 students for the experimental group and 13 students for the control group. And two students were absent.

2. Instruments

In the pretest session the score before the experiment is the Duolingo App in both the treatment group and control group. Students were given the test within 36 Words as an instrument and their pronunciation was measured by Phonetic Oxford. Using Phonetic Oxford to measure Vowel (short & long) of student pronunciation.

The posttest session takes the score after implementing the Duolingo App in the treatment group. The 36 words with advanced level. When students were pronounced the 36 Words and was measured by Phonetic Oxford.

3. Data Analysis

The pretest and posttest data of both experimental and control groups were analyzed by using obligatory occasions in scoring. According to Farid and Zulfikar, A (2016), that the scoring data was calculated with the formula:

$$Individual\ score\ =\ Original\ Score\ Instrument\ X\ 100 = Total\ Score$$

After that data is analyzed by Statistical Package (SPSS) with non-Parametric Test (Wilcoxon test and Mann-Whitney test).

D. Findings
1. Results

This result of research was calculated by SPSS with a non-Parametric Test. And in this section are descriptive stats, test of normality, and non-Parametric test (Wilcoxon test and Mann-Whitney test).

Descriptive Stats table
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pretest Experiment	13	19	72	56.84	13.255
Posttest Experiment	13	42	72	53.42	8.421
Pretest Control	13	0	64	52.56	17.549
Posttest Control	13	39	69	52.35	10.322
Valid N (listwise)	13				

Tests of Normality

	Group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Pairs	Pre-Test Experimental	.237	13	.044	.803	13	.007
	Post-Test Experimental	.169	13	.200*	.925	13	.296
	Pre-Test Control	.274	13	.008	.673	13	.000
	Post-Test Control	.163	13	.200*	.940	13	.456

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Based on the results of the pre-test, the experimental group and control group were analyzed by using *Kolmogorov-smirnov* to know the normality of data. And the results of the normality test p= 0.00 (<0,05), so that the pre-test data were not indicated normally distributed.

Based on the results, the post-test experimental group and control group were analyzed by using *Kolmogorov-smirnov* to know the normality of the data. And the results of the normality test p= 0,02 (<0,05). So, that was not indicated normally distributed. Because the sig value from the *Kolmogorov-smirnov* test <than 0.05, So the data were not indicated normally distributed.

In this case, the research data have not normally been distributed and in this SPSS, we use non-parametric tests. There is the Wilcoxon test. Firstly, the data from pretest and posttest experiments were analyzed by the Wilcoxon test.

Table Wilcoxon test (Experimental Group)

Ranks

	N	Mean Rank	Sum of Ranks
Negative Ranks	9	6.67	60.00
Post-Test (Experimental)-			
Positive Ranks	3	6.00	18.00
Pre-test (Experimental			
Ties	1		
Total	13		

a. Post-Test (Experimental) < Pre-Test (Experimental
b. Post-Test (Experimental) > Pre-Test (Experimental
c. Post-Test (Experimental) = Pre-Test (Experimental

Based on the Wilcoxon test table, the value of negative ranks is 9 and 6.67 in Mean Rank, and have 60.00 for Sum of Ranks. Then that means there's a drop in data from pre-test scores to post-test. Moving to positive ranks, there are only 3 positive ranks data. So, it could be seen a drop in the students' pronunciation. And the Mean rank is 6.00 and the Sum of Ranks is 18.00. Lastly, the Ties value is 1, so in a sense there is one value that is the same in pretest and posttest in experimental groups.

Test Statistics[a]

	Post-Test (Experimental) - Pre-Test (Experimental
Z	-1.651[b]
Asymp. Sig. (2-tailed)	.099

a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

Based on the output SPSS, it can be seen as Asymp. Sig (2-tailed) is .099. Because .099 value is higher than from 0.05 so the Null Hypothesis is accepted and Ha is rejected. That means there is no average difference in the pretest and posttest score in students' pronunciation that was given a treatment. So, it can be seen to have an insignificant effect on students' pronunciation.

In this research, researchers used two groups: the experimental group and control group. And the data was analyzed in a normality test. So, the researcher was analyzed by a Wilcoxon test in a control group to know the results.

Table Wilcoxon test (Control Group)

Ranks

		N	Mean Rank	Sum of Ranks
	Negative Ranks	6	6.50	39.00
Post-Test (Control)-	Positive Ranks	5	5.40	27.00
Pre-test (Control)	Ties	2		
	Total	13		

a. Post-Test (Control) < Pre-Test (Control)
b. Post-Test (Control) > Pre-Test (Control)
c. Post-Test (Control) = Pre-Test (Control)

Based on the Wilcoxon test table, the value of negative ranks is 6 and 6.50 in Mean Rank, and 39.00 for Sum of Ranks. Then that means there's a lower amount of data from pre-test scores to post-test. Moving to positive ranks, there are only 5 positive ranks data. So, it could be seen a drop in the students' pronunciation. And the Mean rank is 5.40 and the Sum of Ranks is 27.00. Lastly, the Ties value is 2, so in a sense there is one value that is the same in pretest and posttest in the control group.

Test Statistics[a]

	Post-Test (Control) - Pre-Test (Control)
Z	-.535[b]
Asymp. Sig. (2-tailed)	.593

a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

Based on the output SPSS, it can be seen as Asymp. Sig (2-tailed) is .593. Because .593 value is higher than from 0.05 so the Null Hypothesis is accepted and H1 is rejected. It meant that there was no average difference in the pretest and posttest score in students' pronunciation that used conventional methods. So, it can be seen to have an insignificant effect on students' pronunciation.

A non-parametric test, Mann-Whitney test was used to answer the hypothesis whether there was significant effect or not in teaching pronunciation by Duolingo App. Based on the normality test of the subjects' pretest and posttest data of experimental and control group, showed the data was indicated not normally distributed.

The N-Par test in Experimental and Control group

	Ranks		
Group	**N**	**Mean Rank**	**Sum of Ranks**
Pairs			
Pretest Experimental	13	14.35	186.50
Pretest Control	13	12.65	164.50
Total	26		

The mean rank of pretest experimental is 14.35, and Sum of Ranks is 186.50 with N 13. moving on the mean ranks of pretest Control is 12.65, and Sum of Ranks is 164.50 with N 13. It could be seen that the mean ranks of pretest experimental experiments are higher than pretest control.

Test Statistics[a]

	Pairs
Mann-Whitney U	73.500
Wilcoxon W	164.500
Z	-.572
Asymp. Sig. (2-tailed)	.567
Exact Sig. [2*(1-tailed Sig.)]	.579[b]

a. Grouping Variable: Group

b. Not corrected for ties.

The table reports the results of Mann-Whitney test analysis of pre-test in Experimental and control groups. The analysis showed that the *sig. (2-tailed)* value is 0,56 ($p > 0,05$) ; it indicates there is no significance between the pre-test score in the experimental and control group. The significant level of 0.56 was higher than 0,05. So, consequently it can be concluded that the pre-test score of the experimental group and control group are equal. This phenomenon showed that the subject of the experimental and control group is homogenous, which means the subjects in both groups have equal English competence.

After analyzing the N-Par test score of pre-tests in the experimental and control group. The N-par test was also done for Post-test scores in experiment and control group.

The N-Par test of Post-test in Experimental and Control group
Ranks

Group	N	Mean Rank	Sum of Ranks
Pairs			
Posttest Experimental	13	14.00	182.00
Posttest Control	13	13.00	169.00
Total	26		

Based on the table, the mean rank of posttest experimental is 14.00, and Sum of Ranks is 182.00 with N 13. moving on the mean ranks of posttest Control is 13.00, and Sum of Ranks is 169.00 with N 13. And could be seen the mean ranks of posttest experimental higher than posttest Control.

Test Statistics[a]

	Pairs
Mann-Whitney U	78.000
Wilcoxon W	169.000
Z	-.336
Asymp. Sig. (2-tailed)	.737
Exact Sig. [2*(1-tailed Sig.)]	.762[b]

a. Grouping Variable: Group

b. Not corrected for ties.

This table describes the N-Par test analysis of post-test data for both experimental and control groups. The analysis showed that the *sig. (2-tailed)* value is 0.73 (p >0,05). The results report that there was no significant level because the value 0,73 was higher than 0,05. So, it can be concluded that there are insignificant effects for teaching pronunciation by using the Duolingo App. That is to say that, H1 is rejected and Ho is accepted; there is no insignificantly effective improvement in students' English pronunciation.

2. Discussion

Looking at the results of the pretest of both groups' statistical table from Mann-Whitney test it can be inferred that students from both groups have similar competence

in pronunciation. And the Mann- Whitney test shows that there is no significant difference in their mean scores.

Because not all students with the same competence can distinguish or understand short and long vowels, then this adaptation is important. So the Duolingo app is ineffective in boosting students' pronunciation skill, especially in a long vowel. Then, in short vowel students had no different competence in pronunciation.

In the use of digital media or technology, there are various methods that could be alternative in helping to use that medium to achieve the goals. Duolingo's user combined two learning methods in one session for example. This means that having similarity with using Duolingo App, after students learn pronunciation from Duolingo App, teacher asks students about the pronunciation which has been obtained in Duolingo. For instance, I asked students to write or replay the pronunciation that was found in the Duolingo App.

Based on the results from the SPSS with NPAR test the descriptive stats data, it could be seen that the Duolingo App is not an effective medium for teaching pronunciation. The students who attended the treatment sessions using the App did not score significantly higher than their pretest. There could be some factors why students found difficulty distinguishing short and long vowels. First, students are less accustomed to the vocabulary of short and long vowels. Second, it seems that students had low motivation to learn English because they felt that English pronunciation and vocabulary is difficult. They often admitted that it was difficult to pronounce English correctly. The third reason is that the treatment process only allowed two meetings, which is far from the ideal number of meetings needed.

Duolingo users cannot be short on time, and it takes a long time for students to get used to the English language. Because Duolingo can only be accessed through phones, PCs and other devices. So that is the main effect factor among students who live in a dormitory and have limitations to operating the phone, pc, and other devices.

In the current research, after comparing the results of the post-test experimental group and post-test control group, there was an insignificant effect in teaching pronunciation of short and long vowels by Duolingo App. Teaching pronunciation by Duolingo App means helping students to overcome their difficulties in pronouncing English words, especially in a short and long vowel. According to the results of hypothesis testing, it is known that the use of Duolingo App insignificantly helps students' pronunciation.

E. Conclusion

Based on the statistical calculation at chapter IV, there was a significant difference between teaching pronunciation by using Duolingo App and without using Duolingo App, but there are insignificant effects between pre-test and post-test in the Experimental group. The results showed the p-value of Mann-Whitney test is 0,73 higher than 0,05. It means that the Null Hypothesis (H0) was accepted and the Alternative Hypothesis (H1) was rejected. Hence, the Duolingo App is ineffective at eleventh grade of vocational high school.

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