Article

# The Implementation of Duolingo Mobile Application in English Vocabulary Learning

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**A B S T R A C T**

The purposes of this research are as follows: to obtain data and to analyze the effects of the implementation of Duolingo mobile application in English vocabulary. The research was held at SDN 02 Ciputat. All data variables were taken through tests. For vocabulary mastery tests, the data was taken in the questionnaires form. The method used was to conduct a system quality test (Software Quality Assurance) of software quality based on the factors and the criteria established. The data shows that the application gets a score with a pretty good predicate (73,8%), so learning media using the Duolingo mobile application can be applied especially for students in understanding English.

## INTRODUCTION

English is an international language that is widely used worldwide. In Indonesia, English is considered as a Second Language (ESL) that is very important for international communication, politics, society and culture and also for communication and group work activities in international classrooms (Behroozi and Amoozegar, 2014). With the advancement of new digital technology, there has been a very rapid increase in the importance of studying ESL to communicate with students from various parts of the country (Golonka, et. al., 2014). For students, it is expected to have sufficient skills to English mastery to provide great benefits for personal needs and professional demands. There are four basic skills that have to be mastered by the students. The four skills are reading, listening, speaking, and writing. All four skills are expected to do as a whole, but the emphasis is on reading. Vocabulary is also taught to support language skills. In the modern education system, teachers serve as a transmitter of teaching materials that have been equipped with technology-based educational media to allow the process of delivering material can take place effectively and efficiently. This is done to achieve basic competency standards and assessment instruments as indicators of learning achievement.

The use of mobile applications, for example -games- as a learning media by educators can create an atmosphere that can increase student's motivation for learning English. Learning English using mobile application is creative and systematic effort to stimulate learning interest and to create experiences that can help students' learning processes so that they are not getting bored easily to attend the learning process. Children of eight years and younger consume, on average, 2.5 hours a day using a mobile phone and the percentage of that time on mobile devices has tripled since

2011, from 15 to 48 minutes a day (Bernacki, Greene and Crompton, 2020).

The researchers overview that students find difficulty in English vocabulary mastery. Some factors include the lack of teacher's motivation in developing teaching vocabulary and the lack of students' vocabulary mastery, the teacher only takes vocabulary material from books, English is not a required subject so that the availability time just only 2 (two) hours a week, as well as a better tendency for children to play. Based on the issues above, prompting the researchers to select one of the English teaching techniques using Duolingo application. The researchers' interest in choosing Duolingo application is that the application uses gamification techniques that make it easy and fun to use. Gamification is a game-based and aesthetic learning mechanism that engages people to think, play, motivate, and solve problems (Kapp, 2012). This application can be easily downloaded by teachers and students for free on the Play Store via their mobile devices. Unlike the serious game, gamification applications do not have gameplay designed for specific purposes. It is just a collection of game elements which are used for different purposes without changing the existing system practices (Huynh, Zuo and Lida, 2018). The principle of vocabulary learning that appears is that each word analyzed or enriched by other associations' imaginations and associations, more likely that these words will be preserved (Carter, Ronald and McCarthy, 2013). English language skills can be categorized into receptive and productive skills (Scrivener, 2011). However, most gamification products are assessed through surveys or usability tests (Hanus and Fox, 2015). The first refers to listening and reading skills, while the latter relates to speaking and writing. This study aims to obtain data and to analyze the effect of the implementation of Duolingo application as an English vocabulary learning application in South Tangerang public elementary schools. With this test, the application is expected to get a grade with a good predicate so that Duolingo application can be applied by teachers to students in English vocabulary learning.

Vocabulary is an object in language as a linguist involved in foreign language teaching methodology. Vocabulary is one aspect of language, which is very important for language competence mastery. According to Webster's Ninth New Collegiate Dictionary (Webster, 1987), vocabulary is: 1) A list or collection of words or phrases usually alphabetically arrange and explained or defined; and 2) A list or collection of term or codes available for use.

Zahedi & Abdi (2012) in their writing research also stated that one of the components to master English as a foreign language is vocabulary mastery. It means that the students

have the ability in understanding and using words and meaning. The students know the words and their meanings. It also plays an important role in English language skills.

Duolingo application is an English learning application available in Web, Android, iOS and Windows Phone versions (Team, n.d.). Not only English can be learned through Duolingo, other languages (Spanish, French, German, Dutch, etc.) are also provided. Duolingo has received Google Play's Best of The Best 2013 award from Google Play. It's very easy to get for free through the Google Play Store, Duolingo uses gamification techniques that provide written learning and with sound so it's helpful to make many people learn the language. The researchers concentrate this research on the use of Duolingo application as an English learning media.

Media comes from Latin 'medium' which means the introduction or intermediary is an informative introduction tool, from the owner of the information to the recipient of the information. Media is an attraction or tool used by teachers in teaching and learning to facilitate the process of providing learning material to students. Learning Media is a tool in the learning process both inside and outside the classroom, further explained that learning media is a component of learning resources or a physical vehicle that contains teaching materials in the student environment that can stimulate students to learn (Arsyad, 2011)

## METHOD

This study used Duolingo English learning application. This study aims to measure the effectiveness of the Duolingo mobile application in English vocabulary learning compared to the traditional teaching system at SDN 02 Ciputat located on Jl. Pemuda No. 7 Ciputat, South Tangerang. The study was conducted by testing applications for 10 respondents to obtain quantitative data which was then processed and tested with software quality measurement techniques (SQA). In the selection of the sample, this study used non-random sampling, the sample selection process that not all members of the population had the opportunity to choose. The researchers took 5 samples from an English teacher in SDN 02 Ciputat and 5 IT experts. The researchers used quantitative methods, with hypothesis testing with software quality measurement techniques (SQA). The testing method used was to perform a system quality assurance to measure the quality of the software based on the factors and the criteria specified.

To ensure that Duolingo application used has a minimum standard quality, one method for quantifying the quality of software quantitatively is the SQA (Software Quality Assurance) method. The technical approach requires software quality to be measured quantitatively, in the form of numbers that are easily understood by humans. For that,

it is needed parameters or measurement attributes specified. According to McCall, Richards and Walters (1977), Hierarchical attributes, where high-level attributes called factor (factor), and the lower level attributes are called criteria. These factors indicate the quality attributes of the product from the user's perspective. While the criteria are product quality parameters from the software point of view. The factors that will be used in this test are as follows:

1) **Reusability**, the ability to be reused according to its scope and function.

2) **Usability**, the ability to be learned and operated easily.

3) **Reliability**, the role and the functionality of the software.

4) **Consistency**, the use and the technical design of documentation on all forms of application.

5) **Integrity**, the ability to access software control.

Software quality is measured by the method of adding all criteria in a factor according to the specified weight.

The measurement formula used is:

$$\mathbf{Fa} = w1c1 + w2c2 + \cdots + wncn$$

Wherein:

- **Fa** is the total value of **a** factor
- **wi** is the weight for criteri**a i**
- **ci** is the value for criteria **i**.

## RESULTS AND DISCUSSION

There are so many ways of English learning media that are able to use besides textbooks such as, using silent media, audio media, visual media, audiovisual media, motion media and game-based learning media applications. Many studies have shown that the use of the media mentioned above can increase learning motivation and increase English vocabulary mastery. The students find it easier to understand the material and to reduce boredom when learning English using games (Lusi, 2012). The use of mobile applications in learning vocabulary idioms is more effective than traditional teaching methods (Basal, et. al., 2016). Some of the most desirable media utilization technology in learning is gamification (Dehghanzadeh, 2019), educational digital games (Agudo, Rico and Sánchez, 2016), mobile technology (Üstün-Aksoy and Dimililer, 2017), music/voice (Linnavalli, et. al., 2018), educational robots (Vogt, et. al., 2017).

Here's an app-based Duolingo mobile learning model interface.



**Figure 1** Duolingo's Interface
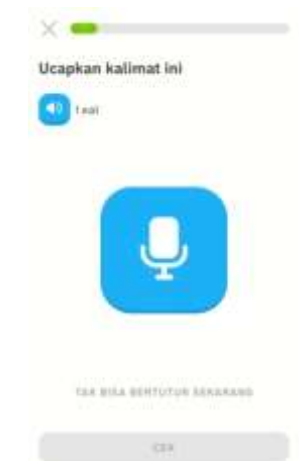


**Figure 2** Example Description



**Figure 3** Example of Figure Caption

**Figure 4** Example of Caption Figure

## A. Software Quality Assurance (SQA)

By specifying the average value of each existing criterion, the result of the software quality assessment obtained from 10 respondents can be seen in the table below.

**Table 1**. Software Quality Assessment Results

| No | Factor | Factor Weight | Criteria | Weights Criteria | Average |
|----|--------|---------------|----------|---------|---------|
| 1. | **Reusability** (Ability to be reused according to its scope and function) | 0,2 | Duolingo can be as vocabulary learning medium. | 0,3 | 72,5 |
| | | | Duolingo can be used on any English vocabulary teaching material. | 0,3 | 71,5 |
| | | | Duolingo can assist in English vocabulary learning activities. | 0,4 | 73,5 |
| 2. | **Usability** (Can be learned and operated easily) | 0,2 | Duolingo can be learned in a short time. | 0,25 | 76,5 |
| | | | Can be used as learning medium for teachers in delivering vocabularies. | 0,25 | 80,5 |
| | | | Provides clear instructions for operating procedures. | 0,25 | 75 |
| | | | Clearly in answering the question. | 0,25 | 77 |
| 3. | **Reliability** (Reliability in the role and the functions of the software) | 0,2 | Duolingo is able to answer complex vocabularies. | 0,3 | 70 |
| | | | Duolingo has an interesting feature in the vocabulary learning process. | 0,3 | 69 |
| | | | Duolingo can be used smoothly without any technical interference. | 0,4 | 72 |
| 4 | **Consistency** (The use and the design of technical documentation on all forms of application) | 0,2 | Duolingo can run well on all types of mobile phones. | 0,3 | 64,5 |
| | | | Duolingo's appearance does not change on all existing system operations on mobile phones. | 0,3 | 67,5 |
| | | | Duolingo is technically able to improve vocabulary learning level in the Application view. | 0,4 | 73 |
| 5 | **Integrity** (Control access Capabilities) | 0,2 | Duolingo has login access to operate it. | 0,5 | 74,5 |
| | | | Login access can facilitate the user's desire in vocabulary learning choices. | 0,5 | 75 |

Results of the assessment of respondents were then calculated the total value by using the formula:

**Fa** $= w1c1 + w2c2 + \cdots + wncn.$

Then the sum of 100% multiplied by the weight in percent provision is as follows:

| | |
|---|---|
| 80-100% | = Very Good |
| 60-79,9% | = Pretty Good |
| 0-59,9% | = Not Good |

The calculation of each quality factor is based on the specified criteria are as follows:

**Reusability** $= w1n1 + w2n2 + w3n3$
$= (0,3 \times 72,5) + (0,3 \times 71,5) +$
$(0,4 \times 73,5)$
$= 21,75 + 21,45 + 29,40$
$= \mathbf{72,6}$

**Usability** $= w1n1 + w2n2 + w3n3 + w4n4$
$= (0,25 \times 76,5) + (0,25 \times 80,5) +$
$(0,25 \times 75) + (0,25 \times 77)$
$= 19,13 + 20,13 + 18,75 +$
$19,25$
$= \mathbf{77,25}$

**Reliability** $= w1n1 + w2n2 + w3n3$
$= (0,3 \times 70) + (0,3 \times 69) + (0,4 \times$
$72)$
$= 21 + 20,70 + 28,80$
$= \mathbf{70,5}$

**Consistency** $= w1n1 + w2n2 + w3n3$
$= (0,3 \times 64,5) + (0,3 \times 67,5) +$
$(0,4 \times 73)$
$= 19,35 + 20,25 + 29,20$
$= \mathbf{68,8}$

**Integrity** $= w1n1 + w2n2$
$= (0,5 \times 74,5) + (0,5 \times 75)$
$= 37,25 + 37,50$
$= \mathbf{74,75}$

So the total quality ($\Sigma$) obtained are as follows:

$\Sigma = (0,2 \times 72,6) + (0,2 \times 77,25) + (0,2 \times 70,5) + (0,2 \times 68,8) + (0,2 \times 74,75)$
$= 14,52 + 15,45 + 14,1 + 13,76 + 14,95$
$= \mathbf{72,78}$
$= 72,78 \times 100\%$
$= \mathbf{72,78}\%$

From the assessment analysis above, it can be concluded that the scores obtained through a questionnaire regarding the Duolingo application score (72.78%) with a pretty good predicate.

### B. User Requirement Evaluation

**Table 2** User Requirement Evaluation Results

| No | User Requirement | Duolingo Feature | Weight | Average |
|---|---|---|---|---|
| 1. | Can record sound to be translated | There is no voice recorder feature to be the vocabulary input will be searched. | 0,2 | 47 |
| 2. | Provides text, image and audio combinations in vocabulary learning | Available text, image and audio combinations in vocabulary learning. | 0,2 | 78 |
| 3. | Has a level/degree of difficulty in learning vocabulary | There is a learning level feature in Duolingo application. | 0,2 | 86 |
| 4. | Can choose language input to be learned (Indonesian-English / English-Indonesian) | Available menu of options for initial language input and the language to be addressed. | 0,2 | 78 |
| 5. | Vocabulary in the application according to the Oxford dictionary | Duolingo vocabulary database already complies with Oxford dictionaries | 0,2 | 80 |

Based on the assessment above, the value can be calculated according to the requirement as follows:

$\sum = (0{,}2 \times 47) + (0{,}2 \times 78) + (0{,}2 \times 86) + (0{,}2 \times 78) + (0{,}2 \times 80)$

$$= 9{,}4 + 15{,}6 + 17{,}2 + 15{,}6 + 16$$
$$= \mathbf{73{,}78}$$
$$= 73{,}78 \times 100\%$$
$$= \mathbf{73{,}78}\%$$

From the user requirement evaluation results through questionnaires, this Duolingo application got (73.78%) scores with a pretty good predicate, so this application can be stated to help the teachers in 02 Ciputat Elementary School as a learning media based on mobile application.

## CONCLUSION

From the results of the research conducted, it is obtained some conclusions that this activity has not fully achieved the expected targets and outcomes, but it can be concluded that the use of learning media based on mobile application (Duolingo) can make teaching and learning activities more effective and varied, providing alternative learning media for a teaching-based mobile application that can be used to improve students' ability to speak English and their vocabulary mastery.

Based on the results of software quality assurance (SQA) that has been done, this application gets a total quality score of 72.78% with a pretty good predicate.

From the user requirement evaluation results, Duolingo gets a pretty good value of 73.78% so that this application can be used as a learning medium based on a mobile application for elementary school teachers.

The researchers suggest the teacher to play an active role in motivating and encouraging students to make reading as a habit and to continue to practice and to develop their vocabulary regularly. Of course, these things will affect students' achievement. Good vocabulary mastery helps students express their ideas correctly and well.

By having many vocabularies, students will be able to understand better about reading material, to digest someone's speech, to speak fluently, to give a response, and to write several types of topics effectively.

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## NOMENCLATURE

- **Fa** is the total value of **a** factor
- **wi** is the weight for criteri**a i**
- **ci** is the value for criteria **i**.