Design of Augmented Reality as Digital Teaching Media English Vocabulary: Word Warrior

Andam Lukcyhasnita[1,*], Orli Binta Tumanggor[2], Winda Syafitri[3], Dina Arfianti Siregar[4] & Juneidy[5]

[1,2,3,5] Graphic Multimedia Engineering Technology, Computer Engineering and Information Technology, Politeknik Negeri Medan, Indonesia.
[4] Public Financial Accounting, Accounting, Politeknik Negeri Medan, Indonesia.

Email address:
andamlukcyhasnita@polmed.ac.id

[*] Corresponding author

To cite this article:

Abstract: The need for digital learning innovation is one of the latest issues. Especially in learning English. This is because Indonesia, based on the English Proficiency Index, or EPI (English Proficiency Index), is ranked 81st out of 111 countries in the world and is ranked 15th out of 24 countries in Asia with low English proficiency status results. So, in order to encourage English language skills, innovative efforts are needed in English language learning that can generate interest in learning. Especially in delivering English vocabulary teaching materials. Therefore, this research aims to produce a multimedia product that can be applied as an interactive teaching medium for English vocabulary. To achieve the output, this research used the Research and Development research method, using research steps consisting of (1) Define, (2) Design, (3) Development, and (4) Dissemination. However, this research is limited to the development level, so the final result of this research is a digital medium in the form of an Instagram vocabulary game filter game called Word Warrior. This filter game carries vocabulary games with correct spelling.

Keywords: Digital, Learning, Games, Augmented, Reality, Vocabulary

1. Introduction

Digital learning innovation is one of the current issues. Digitalization of learning is one solution to several problems in the world of learning. One of them is related to attracting interest in learning, especially interest in learning English. Based on data from EF Education First (https://www.ef.co.id/epi/) reporting in the 2022 edition of the English Proficiency Index or EPI (English Proficiency Index) Indonesia is ranked 81st out of 111 countries in the world and ranked 15th out of 24 countries in Asia with low English proficiency status results. Also, based on the results of the survey, it was also found that Indonesia is one of the countries that has a gap in English language skills among the young age group with a low level of English compared to those aged over 30 years (EF EPI EF English Proficiency Index Ranked 111 Countries and Territories by English proficiency, 2022).

Yunita Yanti, EF Indonesia Academic Operations Manager said that there are several things individuals can do to improve their English language skills, namely: (1) Learn English every day, even if only for a few minutes. (2) Set specific and achievable goals, then write them down so you can remember them. (3) Memorize vocabulary that is relevant to your job or field of study and start using it immediately. (4) Practice speaking, even if it's just reading a book aloud. (5) Watch TV, read, or listen to the radio in English. (6) Use social media in English and set computers and apps to English to get more native exposure to the language (kompas.com, 2022).

Apart from that, in the process of learning English there are two basic components, namely Vocabulary or

vocabulary and Grammar or sentence structure. Vocabulary is the main capital for learning English. Mastering a lot of vocabulary will make it easier for someone to read, write, listen and speak English (Kartikasari, 2021). However, the vocabulary learning methods that are widely applied tend to be boring, this is because usually Students are only placed as listeners and note takers. So the communication process in learning seems monotonous and one-way. Meanwhile, a good learning process must contain interactive, fun, challenging and motivating aspects. Fun learning activities are greatly influenced by various factors, one of which is that the choice of learning media used must be interesting for learning, interactive when used, but not reduce the essence of the material presented (Mustaqim & Kurniawan, 2017).

One of the developments in learning media that is currently still new is learning media using Augmented Reality. Augmented Reality or AR is a technology that combines real-time digital content created by a computer with the real world. Augmented Reality allows users to see 2D or 3D virtual objects projected onto the real world (Juliarto, 2020). Moreover, the application of Augmented Reality (AR) on social media, especially on Instagram as a filter feature, makes the application of Augmented Reality popular, especially in the young age group.

So with the existence of Augmented Reality and its application as a feature in the social media Instagram, it can be an interesting alternative medium for learning English vocabulary.

2. Research Flow and Methods

2.1. Research Flow

In the research flow process that will be carried out by the researcher, the researcher will follow several stages as follows:

1. Pre-Production

At this stage the researcher will collect data and plan the product to be designed. Data collection was carried out to determine user models and interests in using Instagram filters. Then, the results of the data are analyzed to determine trends which will then be translated into product planning, namely Instagram filters.

2. Production

At this stage the researcher will carry out design, namely graphic design and Augmented Reality design. Until finally a product was produced in beta version.

3. Post Production

At this stage the researcher will conduct product trials.

2.2. Methods

To achieve the output, in this research used the Research and Development research method where the steps consisting of (1) Define, (2) Design, (3) Development and (4) Dissemination. However, this paper is limited to the Development level

In the define stage, the researcher defines the idea and story of the game. At this step, the researcher prepares a plan for the game that he wants to build, starting from planning the game mechanism and the assets in it.

In the design stage, researchers prepare the assets needed for game development. The assets developed in this research are visual assets consisting of logos and characters in the game. In the development stage, researchers develop games using programming languages so that game applications can be formed.

3. Result

3.1. Define

In the define process, researchers develop game ideas and stories. The idea in this game is an adventure genre game. An adventure about a person who overcomes a vocabulary barrier. Players are required to be able to collect English vocabulary with correct writing and avoid English vocabulary with incorrect writing. Then this idea is developed into planning the game mechanism. Mechanism planning is carried out using a system analysis study which begins by creating a Use Case Diagram and Activity Diagram. The resulting diagram is as follows:
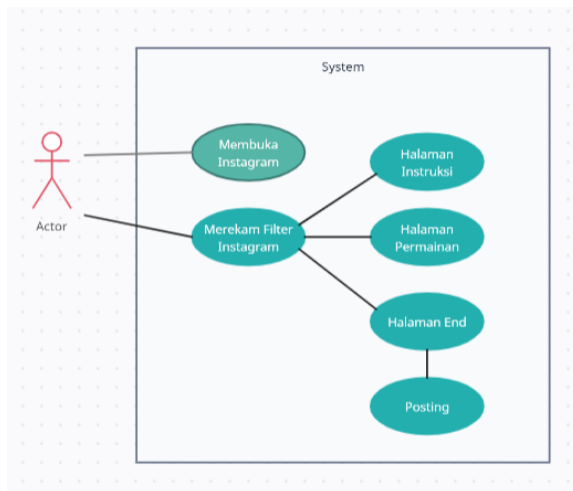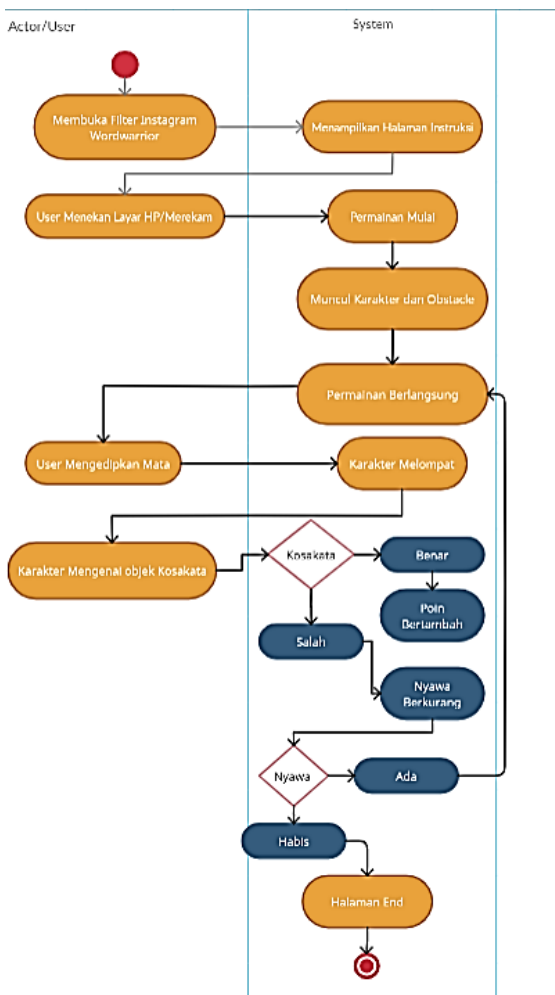

Figure 1. Use Case Diagram

used in the game start and the end character will be used on the game end page.

Furthermore, the researchers also created word objects which were important assets in this game. The word object consists of several English words that are commonly used every day. Word assets are divided into two assets, namely correct word assets and incorrect word assets. Correct word assets consist of object pictures and correct vocabulary writing, while incorrect word assets consist of object pictures and incorrect vocabulary writing

Figure 4. *Word object assets, (left) True, (right) false*

After preparing the visual assets, then application development is carried out. Application development in this research uses Meta Spark. The Word Warrior game mechanic uses Augmented Reality Face tracking and simply uses the logic that when the player blinks his eyes the character will jump to avoid the object. The game will end when the character's life/chance runs out.

Figure 2. *Activity Diagram*

From the results of this analysis, in visual design it was found that several interfaces were needed, namely the need to design instruction pages, game pages, end pages, object characters, obstacles and life icons.

3.2. Design

In the design process, researchers carry out visual asset preparation activities and application program development activities. In designing visual assets, researchers create character designs. The character that is built is the character of a warrior. The character development in this game visualization includes elements of North Sumatran culture to give the work an identity that originates from North Sumatra. The character study was carried out by collecting examples of images of headbands that are iconic to North Sumatra, one of which is Sortali. Sortali has a characteristic hat shape that stretches upwards and has a ulos motif. So the characters in this game use sortoli which has been simplified in its visualization. Then the characters are developed in 3 forms of action, namely stationary characters, jumping, and ending characters. The idle character and jump character will be

3.3. Development

At the development stage, researchers carried out coding development assisted by the Meta Spark Studio application. Design starts from creating an instruction page. The instructions page contains a description of the game procedures. This was created to help prospective players understand the rules of the game.
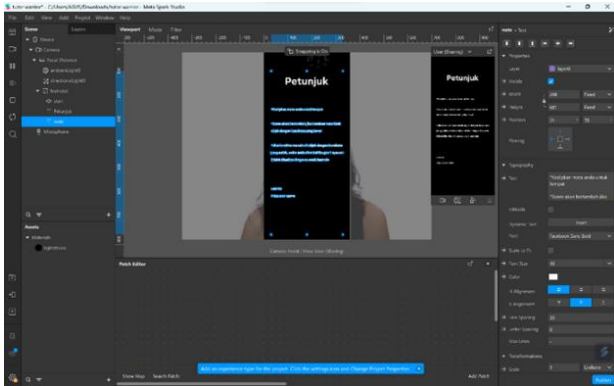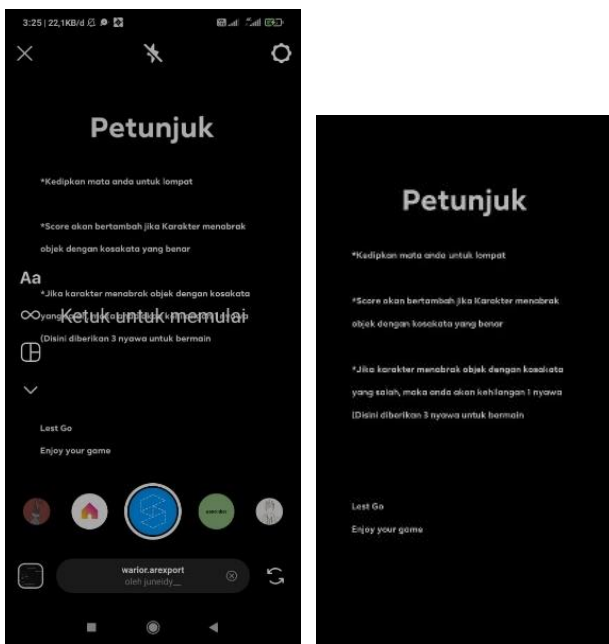

Figure 5. *Instruction Canvas Page View*

Figure 6. *Instruction Page View*

Then, development continued by developing the game page through the Meta Spark Studio application. On the game page, the visual assets that have been created are combined and arranged in their placement.
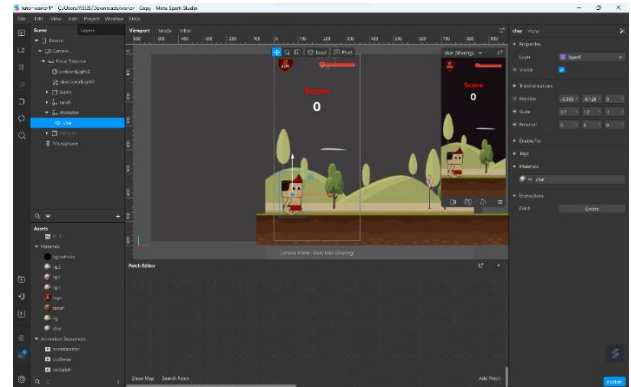
Figure 7. *Game Canvas Page View*

After the visual assets are placed, continue with adding logic to the patch editor window. Additional logic is added to game scoring, characters, lives, and obstacle/object words. So that a logic begins to form in the game where when the player blinks the character will jump and when the character hits the correct word object the score will increase, while if it hits the wrong word object the number of lives will decrease, and if the lives run out then the ending page will appear or the game ends.

Then, development continued on the development of the game page ended. The game page ends starting with a blank page canvas in Meta Spark Studio. Then proceed with preparing the visual layout. The visual layout consists of characters and text "Game Over" and the score of the game results.

Figure 8. *Canvas Page View Game Over*

Then, after each page/canvas has been developed, it is exported or published into a filter. The filter being developed is still in beta form, that is, the application is still in the development stage, meaning it is not yet fully ready to be released.

In the process of developing this filter, researchers also conducted product trials. Product trials in this research began with internal trials. This trial was carried out by the research team itself. Test using a Samsung A51 Android device. The results of the trial are as follows:
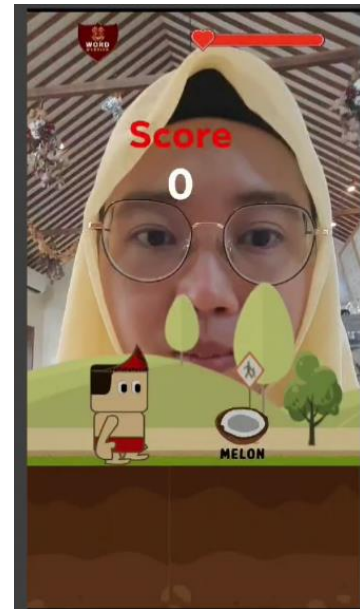
Figure 9. First Trial Test Page View

In the first trial, it was found that there were game interfaces, some of which had not appeared and were cut off. Then, revisions were made to the canvas settings via Meta Spark Studio. So a second test was carried out and it turned out that the characters and objects on the Samsung A51 device did not appear and were covered by the background, whereas on the Xiomi Poco device the interface looked perfect.

Figure 10. Second Test Display, Left on Samsung A51 device and right on Xiomi Poco device

Then, re-development was carried out to adjust the canvas on the Samsung A51 device. Until finally the filter can run well.

Figure 11. Samsung A51 Final Test View

4. Conclusion

This English vocabulary learning media was developed by utilizing augmented reality technology, especially its application in Instagram filters as a new type of learning media to facilitate the process of introducing more interesting English vocabulary, without losing the essence of learning.

Thanks to his contribution during the process of our research activities, this research was finally completed successfully.

References

[1]   EF EPI Indeks Kecakapan Bahasa Inggris EF Peringkat 111 Negara dan Wilayah menurut kecakapan berbahasa Inggris. (2022). Retrieved from Education First: https://www.ef.com/assetscdn/WIBIwq6RdJvcD9bc8RMd/cef com-epi-site/reports/2022/ef-epi-2022-indonesian.pdf?_ga=2.45115234.796655010.1687086649-266141624.1687086649&_gl=1*10bwaqz*_ga*MjY2MTQx NjI0LjE2ODcwODY2NDk.*_ga_25YNHDZQQP*MTY4Nz A4NjY0OS4xLjAuMTY4NzA4Nj

[2]   Juliarto, R. (2020, November 4). Apa itu Augmented Reality dan Contohnya? Retrieved from Dicoding.com: https://www.dicoding.com/blog/apa-itu-augmented-reality-dan-contohnya/

[3]   Kartikasari, T. (2021, April 17). Peran Kosakata dalam Belajar Bahasa. Retrieved from Radarsemarang.jawapos.com: https://radarsemarang.jawapos.com/edukasi/untukmu-guruku/2021/04/17/peran-kosakata-dalam-belajar-bahasa/

[4]   Kompas.com. (2022, 11 18). Indonesia Posisi Ke-81 dari 111 Negara di Indeks Kecakapan Bahasa Inggris. Retrieved from Kompas.com: https://www.kompas.com/edu/read/2022/11/18/150428371/ind onesia-posisi-ke-81-dari-111-negara-di-indeks-kecakapan-bahasa-inggris?page=all