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# Development of Android-based Augmented Reality Media on Vocabulary Mastery and Pronunciation in English Subjects of Junior High School Students

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**Abstract**
The use of learning media in schools is a very concerning urgency. The background of the development of Android-based Augmented Reality media is to see the utilisation of learning media in junior high school. Researchers are developing Android-based Augmented Reality media which is the latest technology-based media with 3-dimensional elements, video, text and sound on English subjects in junior high school. The data collection technique in this study is to use a research and development questionnaire to produce Android-based Augmented Reality media that is feasible to use based on the assessment of media experts, material experts, English language subject teachers and student responses. This research uses the research and development (R&D) method. The development procedure follows the modified Borg and Gall procedure from Sugiono, namely 1) Potential and problems, 2) Data collection, 3) Product design, 4) Design validation, 5) Design improvement, 6) Product trial, 7) Product revision, 8) Final product. The results of this assessment indicate that Android-based Augmented Reality media has excellent feasibility according to media experts got a percentage of 84.17%, material experts 85.4%, teacher assessment 96.25% and student response 87%, which means this learning media is feasible to use

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**Abstrak (Indonesia)**
Penggunaan media pembelajaran di sekolah merupakan urgensi yang sangat memprihatinkan. Latar belakang pengembangan media Augmented Reality berbasis Android adalah untuk melihat pemanfaatan media pembelajaran di SMP. Peneliti sedang mengembangkan media Augmented Reality berbasis Android yang merupakan media berbasis teknologi terkini dengan elemen 3 dimensi, video, teks dan suara pada mata pelajaran Bahasa Inggris di SMP. Teknik pengumpulan data dalam penelitian ini adalah dengan menggunakan angket penelitian dan pengembangan untuk menghasilkan media Augmented Reality berbasis Android yang layak digunakan berdasarkan penilaian dari ahli media, ahli materi, guru mata pelajaran Bahasa Inggris dan tanggapan siswa. Penelitian ini menggunakan metode penelitian dan pengembangan atau Research and Development (R&D). Prosedur pengembangan mengikuti prosedur Borg and Gall yang dimodifikasi dari Sugiono yaitu 1) Potensi dan masalah, 2) Pengumpulan data, 3) Desain produk, 4) Validasi desain, 5) Perbaikan desain, 6) Uji coba produk, 7) Revisi produk, 8 ) Produk akhir. Hasil penilaian ini menunjukkan bahwa media Augmented Reality berbasis Android memiliki kelayakan yang sangat baik yang menurut ahli media mendapat persentase 84,17%, ahli materi 85,4%, penilaian guru 96,25% dan respon siswa 87%, yang berarti media pembelajaran ini layak digunakan.

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**Kata Kunci**
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## Introduction

Education is one aspect of life that will not be separated from every human activity, whether in the form of formal, non-formal, or informal education. In building a civilisation, education is an important sector. Because the development of the quality of human resources is closely related to education so as to produce human beings who are knowledgeable and able to create innovations as a means that can facilitate human activities. With education, human life will be very easily helped because education will centre on the development of science that can be used by humans to solve all the problems that exist at certain times. As time progresses, human life experiences dynamics, from views, conversations, routines, to the ordinary personalities of each generation. Many changes and innovations arise that result in the transfer of attitudes from one generation to another.

The development of science and technology has affected the use of teaching aids in schools and other educational institutions. Recently, teaching and learning activities in schools have begun to be balanced with advances in data technology, resulting in changes and shifts in the educational paradigm (Hujair, 2009). For Triwahyuni Eges (2021: 4) by utilising the rapidly growing advances in Information and Communication Technology (ICT) and sharing positive participation, innovative teaching and learning activities can be tried. This needs to be pursued so that the teaching and learning process does not seem constant and boring which will slow down the transfer of knowledge. Therefore, the position of tools is important in the teaching and learning process because it will make teaching and learning activities more diverse and less boring.

English as a global language is needed in various fields of life. Good English language skills will certainly be a competitive capital, both in terms of education and profession, especially entering the AEC (Asean Economic Community) period in 2015, for S. Handayani (2016). However, the problem that is still experienced is that the Indonesian people's understanding of the meaning of English is still not realised by everyone. Not only that, according to B. Prasetyo (2014), the Indonesian workforce is said to be unprepared for the AEC in terms of foreign language communication, including English. This is reinforced by the EF EPI (English Proficiency Index) English proficiency survey (Education First, 2017) which published Indonesia's score of 52.15 and categorised as a low category.

With this in mind, the author uses Augmented Reality for the teaching and learning process. According to Elvrilla (2011), Augmented Reality is a technology that integrates virtual objects in 2 formats and or 3 formats into a clear area and then interprets the virtual items in a clear duration. Specifically, this technology as a fusion of digital elements with real items into an interesting synergy in the tools embedded in Augmented Reality technology. In short Augmented Reality is the accumulation of virtual subjects to the clear earth. The virtual subject is made as close as possible to the original subject.

The application will be run on Android operating system smartphones because most smartphones currently use the Android operating system. The Android operating system is considered to have a solid position in the mainstream smartphone market. Its open nature makes the Android operating system that Linux raises free and developer friendly. Smartphones that operate with the Android operating system have been supported with high-quality cameras because cameras are an important part of running applications that will be developed.

This application will be used as a way of teaching vocabulary in English that can be used anytime, anywhere and by anyone. In this application, consumers can recognise English from paintings directed by markers. The data delivered is in the form of sound and notes. There are also

teaching and learning activities that are expected to improve students' vocabulary in English as a result of providing more precise learning in terms of articulation or English accent.

## Research Methodology

### Research and Development Model

The type of research used is research and development (R&D). Borg & Gall (Setyosari: 2010: 215) reported that development research is a method used to develop and validate educational products. From this description, the research conducted by this researcher aims to develop an English language learning tool for category 7 students at Ghozali Jember Navy Junior High School (AL). Augmented Reality teaching and learning tools for the Android platform made by researchers intend to create innovation in the development of teaching and learning tools that do not yet exist in teaching and learning activities that have been tried before, the modules contained in Augmented Reality learning tools for the Android platform are vocabulary and skills. pronunciation. In the development of this android-based augmented reality learning device there are several steps that will be tried including skills and problems, gathering information, product concepts, concept validation, concept improvement, product trials, product improvement.

### Development Procedure

In the research conducted by these researchers, researchers use the form of research and development (Research and Development or R & D) this research refers to the form of research and development informed by Borg and Gall (Sugiono 2015, 409), researchers use the form of Borg and Gall modified by Sugiono because this form is very suitable for teaching and learning device development research. From the original 10 steps of Borg and Gall research, the modified version of Borg and Gall research by Sugiono only conducted 8 research steps, stages 8 to 10, namely the big box trial stage, final product refinement, and dissemination were not carried out by researchers due to the suitability of the capabilities and problems found in the research position. Hasyim (2016: 91) says the research stages (Borg and Gall) for dissertations and dissertations can be limited from 10 stages to 8 stages, this is due to Borg and Gall's statement that understands budget and time constraints for researchers who are students writing dissertations and dissertations. Below is a chart illustrating the stages of Borg and Gall's development research adapted by Sugiono.

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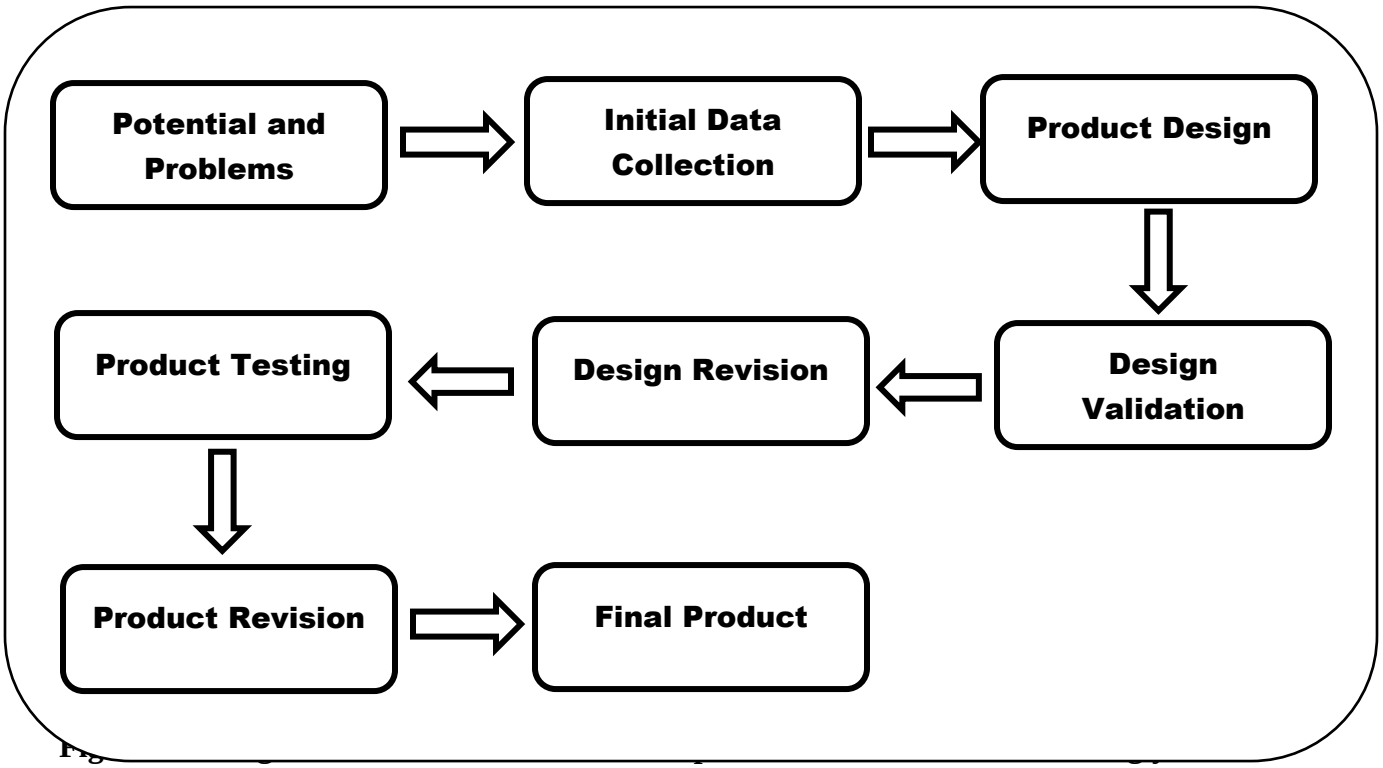


**(2015: 409)**

## Results and Discussion

### Research and Development Results

The method of teaching and learning activities is one of the important steps in gaining insight, this is what causes researchers to hunt down and master the problems that occur during the teaching and learning process. Researchers made observations and followed teaching and learning activities at SMPIT Al-Ghozali which contained English subjects. In this observation, the researcher focused more on seeing the existence of teaching and learning tools used in the practice of guiding and the strength of students in mastering vocabulary and articulation in English.

The reality in the field of teaching and learning activities is only a novel English package and the patches of the room that are not suitable are finally removed, the vocabulary of teaching and learning participants is also considered difficult because the teacher directly interprets the learners in teaching and learning activities. After recognising the problems that occur in the square, the researcher conducted a question and answer session with instructors and teaching participants to conclude that the main problem that limits the teaching participants' difficulties in understanding English vocabulary and articulation (pronunciation) is the lack of tools for teaching and learning activities in English subjects. The first step that must be tried is to find out what tools are suitable so that they can be used to help students in mastering vocabulary and articulation, namely with Augmented Reality tools on the Android platform in the form of flash cards.

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After the capabilities and problems can be addressed in an actual and up to date manner, it is necessary to collect various data that can be used as material for making a product programme that is expected to overcome these problems. Data collection is done after analysing the case in the field. The absence of technology-based teaching and learning activities used in English teaching and learning activities for junior high school category 7 resulted in an important aspect of the case, and the lack of teaching participants' description of vocabulary and pronunciation in English. For researchers, this Android platform Augmented Reality tool is considered efficient. Data information regarding the development of Augmented Reality tools on the Android platform obtained from newspapers, previous research, and expert opinions are combined and processed to produce Augmented Reality teaching and learning tool products on the Android platform with these flash cards. After the tools and materials are available, the researcher starts the arrangement with Assemblr Edu Application.

**Product Design**

This android-based Augmented Reality media is made using the Assemblr Edu application with the following steps:

a. Login with an account that has been registered in Assemblr Edu, through the page https://studio.assemblrworld.com/
b. Then click the create your creation menu.
c. Select the create from scratch menu. Then on the left menu bar there are 3D objects, images, text videos.
d. Next, choose 3D objects that will appear in several categories. From these categories we will choose a category that matches the desired criteria and is in accordance with the theme. In this case, researchers chose the theme of professions or jobs.
e. Then we will choose one of the professions available on the 3-dimensional image.
f. After choosing one profession, we start to determine the scale, rotation and displacement.
g. Furthermore, in accordance with the planning that has been made, the researcher must enter the vocabulary in accordance with the profession that has been selected by clicking on the text menu. Then type the word to be entered and select the appropriate colour then press place to place the word position.
h. The next step is to enter the sound as the pronunciation of the word that has been previously determined. That is by clicking the video button in the menu bar. Enter the link that has been prepared then click place. To eliminate the video screen, simply change the scale to zero so that only the pronunciation of the word is heard.
i. Then click preview before publishing the results that have been made. If it is considered appropriate, then click the publish button. Click capture as Tumblr then enter the title and description of the image.
j. The last step is to click AR Graphic marker as flash card material that can be downloaded and printed out according to the desired size.

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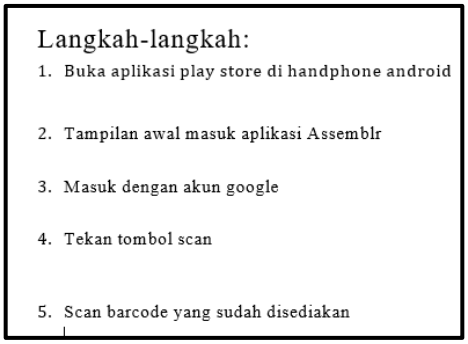
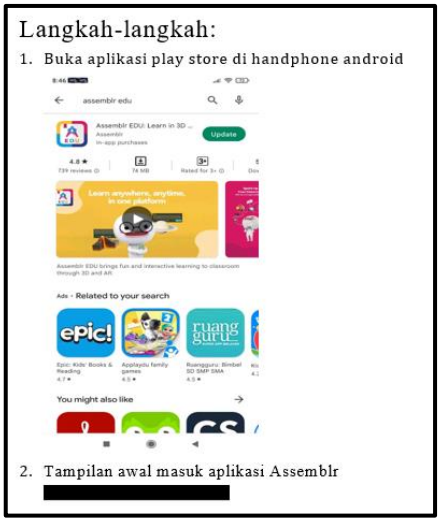
| Before Revision | Sesudah Revisi |
|---|---|
| 1. Image design and writing brightness<br>  <br> | 1. Added office pictures to make it more attractive<br>  <br> |
| 2. Instructions in AR Book<br>  <br>Langkah-langkah:<br>1. Buka aplikasi play store di handphone android<br>2. Tampilan awal masuk aplikasi Assemblr<br>3. Masuk dengan akun google<br>4. Tekan tombol scan<br>5. Scan barcode yang sudah disediakan | 2. Addition of images to the instructions in the AR Book<br>  <br>Langkah-langkah:<br>1. Buka aplikasi play store di handphone android<br>2. Tampilan awal masuk aplikasi Assemblr |

**Table.3.1 Product images before revision and after revision**

After the product was revised according to the expert's recommendation, the second stage of validation was conducted. Since the teaching and learning tools have been improved, and the approval results have proved that the teaching and learning tools are suitable for use, the validation is sufficiently tested in 2 steps.

The initial step module approval considers the views of module relevance, feedback, use of speech or language as well as the views of the tool concept. Based on the results of the initial stage approval by the module expert, further information was obtained: the relevance of the module in terms of the relevance of the module to the low competencies, the relevance of the module to the markers and the strength of the module presented with the teaching materials and learning

activities created, obtained a score of 83 per cent. In terms of victims, in terms of getting the module to explain the tools to consumers, and pressure on consumers to do the learning activities correctly, the score is 86 per cent. Furthermore, to see the use of speech or language in terms of the accuracy of the use of English and the language used is easy to understand, the score is 62.5 per cent. After that, the description of the tool concept in terms of shape, safety, and ease of use of the tool obtained a score of 92 per cent. As a result, in general, the score of the four views is 80.87 per cent.

The results of validation by module experts obtained in step 2 in terms of the relevance of the module in terms of the relevance of the module to low competence, the relevance of the module to the markers and the power of the module presented with teaching and learning activities. tools made, consistently scored 83 per cent. From the view of the victims, in terms of the acquisition of the module explanation of the tools for consumers, and the pressure on consumers to get the correct teaching and learning activities, the score increased to 91.6 per cent. Furthermore, for the view of the use of speech or language in terms of the correct use of English and the language used is easy to understand, the score also increased to 75 per cent. After that, for the display of the tool concept in terms of shape, safety, and ease of use of the tool consistently scored 92 per cent. As a result, in general from the four views, the score is 85.4 per cent. Based on the validity level, the 85.4 per cent figure is in the "very good" category and the module can be claimed to be compatible with the Android-based augmented reality tool being developed.

## Conclusion

1. Android-based Augmented Reality tool aimed at teaching and learning English vocabulary and pronunciation for junior high school designed according to existing modules and curriculum with a combination of 3 cartoon formats and interesting sounds and readings that have been successfully developed using applications on the Assemblr Edu web. The modules in this Android-based Augmented Reality tool are job and occupation modules. This Research and Development was conducted using the Borg and Gall method which consists of 10 stages which were then simplified into 7 stages, namely, problem solving, information gathering, product concept, concept validation, product improvement, product testing, and product improvement.
2. The feasibility level of the tool gets a score of 84.17 percent and the material is 85.4 percent, so the average gets a validity of 84.7 percent. The teacher's reaction scored 96.25 per cent. Judging from the questionnaire assumptions of students obtained an average score of 87 percent and reached a very good standard, meaning that this Android-based Augmented Reality tool is very "feasible" to use.

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