The application of augmented reality in learning English phonetics

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Abstract. EFL learners tend to ignore the importance of understanding English phonetics in spite of its significance in language acquisition process. The failure of using and understanding English phonetics leads to mispronunciation issues which in turn impede both oral and written communication. Concerned with this issue, the research developed the use of augmented reality (AR) technology to facilitate English phonetics learning processes. The technology combined virtual objects and video clips in more attractive and interactive learning environment. This study described the steps and procedures of developing augmented reality as English Phonetic learning media and disclosed how the students utilized this media in their learning processes.

1. Introduction
The development of technology recently is a novel issue which cannot be separated from language teaching and learning activities. At the primary education stage, education is not only focused on developing brain function and teaching children a language basically requires a learning media which is able to draw children's attention in the learning process [1]. One learning media involving technology which is able to apply in teaching children a language is Augmented Reality (AR). AR increases the attention of the students and they seem more focused and involved [2].

Augmented Reality is the advancement in technology, which has been commonly incorporated in the language teaching and learning. Augmented Reality (AR) technology is considered to provide a new teaching model for primary school education under the impact and effect of digital technology [3]. AR or Augmented Reality is a software that offers interactive learning between students and the material taught [4]. By using such software, the teaching and learning activities can be optimized and the teaching material is transferred to the students in enjoyable classroom atmosphere.

It was found that Augmented Reality in the form of books (learning media) could help readers to interact with the content found in the books. In addition, they could more easily understand the learning material. Therefore, the Augmented Reality can be used to improve soft motor skills, communication skills, and other basic skills [5]. Augmented Reality (AR) technologies offer exciting new opportunities for supporting the new learning experiences by imposing digital information on the real world [6].

Augmented Reality is common technology which is very familiar to most people nowadays for the form of digital games such as Pokemon Go and it’s used to provide the teachers the technology for numbers of activities in ESL Classroom with the access of smartphones [7]. Augmented Reality (AR)
is a technique which helps to augment the real world with virtual data, which is blending of the real and virtual world, real time interaction and 3D registration of virtual and real objects [8]. In addition, Augmented Reality was found to improve students' speaking skill by turning the language acquisition into a game under the supervision of both teacher and parents [9].

Considering the findings of previous studies above, the Augmented Reality was found beneficial in speaking and reading skill. However, the study of Augmented Reality in English phonetic learning was still limited. Therefore, the present study attempted to fill in the gap. In this study, Augmented Reality was implemented by incorporating material about pronunciation of English words in audio-visual form. This study aimed to demonstrate and describe how Augmented Reality was developed and applied in the language classroom as the learning media for teaching English phonetics to primary school students. It is expected that by using interactive and interesting content, primary school students can more easily understand and pronounce English words correctly.

2. Methods
This study could be categorized as developmental research, where media learning developed in this study utilized Augmented Reality technology. The development method used in this study was developed by Luther-Sutopo [1]. Multimedia Development was selected based on method steps, where each stage was explained in detail and specifically. There were 6 (six) stages used in the Multimedia Development Method, namely; concept, design, material collection, assembly, testing, distribution and implementation.

![Multimedia development method](image.png)

3. Results and discussion

3.1. Concept
The use of Augmented Reality Technology has a positive impact on understanding learning materials for users [3]. This is an underlying development application based on Augmented Reality as an alternative learning medium.
Table 1. Description of the application concept.

| Types of Application | English Words Phonetics |
|----------------------|-------------------------|
| AR – Based learning application | AR – Based learning application |
| A user | The user of the application is identified or intended for 1st grade of Elementary students aged 6-7 years and teachers, therefore the contents were adjusted with the level of age 6-7 years. |
| The Content | The contents were English words for 1st grade of Elementary school |
| Pictures | Using the file format of JPG and PNG, taken from internet animation |
| Audio and video | Using MP4 format |
| Animation | The animations for the videos were taken from the internet |

The type of this application called AR (Augmented Reality), it is used by 1st grade of Elementary students aged 6-7 years and teachers, the contents were adjusted with the level of age 6-7 years. The pictures in this software are using file format of JPG and PNG, it is taken from the internet animation, for the audios and videos are using MP4 Format.

3.2. Design
Design process was carried out by making a marker design and animation layout design which were used as the Augmented Reality Content.

3.2.1. Marker. Marked Augmented reality uses a two-dimensional barcode to connect a cell phone or personal computer to information, usually on a web site [10]. The marker used was the image of the character downloaded for free from the internet and modified by the researchers. The marker was edited using the paint application from windows and printed on the media in the form of a Flash Card.

![Figure 2. Marker design.]

3.2.2. Animation layout. The animation layout design contained the image of the English Words, the picture and the words. Each animation was equipped with pronunciation sound. The results from the development process were in the form of mp4 format.

![Figure 3. Animation layout design.]

3.3. Material collection
The materials required in the making of this application were obtained from several sources on the internet with some modifications.
3.3.1. *Pictures*. Pictures used in this application were obtained from the internet for free, with modification in certain parts to suit the requirements.

![Figure 4](image1.png)

*Figure 4*. The character.

From this picture, the video was created such as follow:

![Figure 5](image2.png)

*Figure 5*. The video.

3.4. *Assembly*

The character used as a marker was created using screen capture for free taken from the internet and the video used was video film splitter which was also taken from the internet for free.

3.4.1. *Creating aurasma content*. Aurasma creation could be done with the steps as follows:

- Inserting the marker into Aurasma web based studio
- Inserting the overlay or animation which was used as Augmented Reality Aurasma content
- Providing the name of AR content available to make it easier to search for content on the application Aurasma AR later
- Sharing Aurasma content, so other users could see it.

3.5. *Testing*

The test was conducted to verify whether the application had been running well in accordance with the design made earlier. The test was performed against the marker that had been made by using mobile devices. The test results showed that each of the markers could display Augmented Reality content satisfactory. The distance tests showed good result on the range of 5-20 cm with normal lighting indoor conditions.
Table 2. Distance test results.

| No | Distance | Status                        |
|----|----------|-------------------------------|
| 1  | 5 cm     | AR Content appeared           |
| 2  | 10 cm    | AR Content appeared           |
| 3  | 15 cm    | AR Content appeared           |
| 4  | 20 cm    | AR Content appeared           |
| 5  | 25 cm    | Sometimes appeared, sometimes did not |
| 6  | 30 cm    | AR could not appear           |

3.6. Distribution
The Augmented Reality application material then was printed on paper in the form of Flashcards. Flashcards made easier in the learning process because flashcards were simpler from the book or other learning media.

![AR Flash Card](image)

Figure 6. AR Flash Card.

4. Conclusion
From the above research results some conclusions are obtained that Learning media using Augmented Reality Technology can be used as an alternative media to help the English learning vocabulary process and Learning media using Augmented Reality Technology is able to provide more understanding and attention for children in practicing English pronunciation.

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