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# INTERACTIVE AUGMENTED REALITY (AR)-BASED LEARNING CARDS FOR LUN BAWANG LANGUAGE

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**Highlights:** The learning of Lun Bawang among the younger generation is deteriorating due to the lack of learning materials that spur their interest. In this project, a set of interactive augmented reality (AR)-based learning cards was produced. Each card contains interactive elements of Lun Bawang words for young learners to learn.

**Keywords:** augmented reality, learning cards, Lun Bawang

## Introduction

Lun Bawang is one of the minority language in Sarawak and is slowly fading if there is not action to be taken to save this language. Studies shown that Sarawak Indigenous languages are "losing their hold in daily communication" due to widely use of other dominant languages in the society (Ting & Ling, 2012, p. 5; Smith & Smith, 2017). The need to preserve and revitalize this language is crucial as it is part of culture because according to Tengku Sepora Tengku Mahadi and Sepideh Moghaddas Jafari (2012) stated that "words are the most significant tools of cultural symbols" (p. 232). For that reason, one must hear or read about the Lun Bawang's stories, myths or songs to have further understanding of their culture, as the way they use the language can express their thought or way of thinking. Furthermore, proper documentation of a language must be taken into account. This is to help the younger generation to be able to learn the language easily. In Hemmings (2018) studies, she found out that the problem in teaching Lun Bawang is the lack of proper documentation of the language making it difficult to be systematically taught as subject. Hemmings (2018) also noted that phonological and lexical differences are also the problem in learning the language that often cause confusions. Due to lack of resources of the Lun Bawang language the bible 'Bala Luk Do' which dialect of Long Semado is use as references and the older generation for sound description. Fortunately, the indigenous communities have embraced technologies such as audio, video and multimedia as a means to revitalize their language.

Although the study on the use of technology in preserving indigenous languages have been conducted, the use of AR for such purpose remains an area worth investigating. In the case of Lun Bawang, this technology is hoped to be able to lure the younger generations to value the language more and master it from young. Limited studies have been done in this aspect of revitalizing the use of Lun Bawang by using technological tools. Therefore, the purpose of this study is to find out the usefulness of using AR-based learning materials in encouraging young learners to learn Lun Bawang.

## Development of Innovation

The design of this study involved three (3) main stages in relation to the Design Thinking processes. The three (3) main stages are pre-developmental (Empathize and Define), development (Ideate and Prototype) and Evaluation (Test). In the pre-development stage, the learners must be involved in the beginning. For the first stage, empathize stage, the learners are asking to provide feedback of problems in learning Lun Bawang through interview. Then, the problem of difficulty in learning their own ethnic language that was identified in Empathize stage was narrow down in Define stage. Hence, problems in learning Lun Bawang must be identified before moving on to the next stage.

Next, in the development stage of Ideate stage, all ideas, ways or solution are constructed in solving the identified problems of learning Lun Bawang that was obtained in the previous stage. Later, a suitable prototype was developed in learning Lun Bawang. Lastly, evaluation on AR application was tested out by the learners to perceive the usefulness of the AR-based learning materials.

### Description of Innovation

In order to use the card, learners will have to download the Zappar app from Play Store or AppStore and flash it over the learning card. The interactive elements will then pop up and the learner would be able to interact with the buttons provided as shown in Figure 1. The AR-based learning cards contain different elements of multimedia, from audio to quiz games.

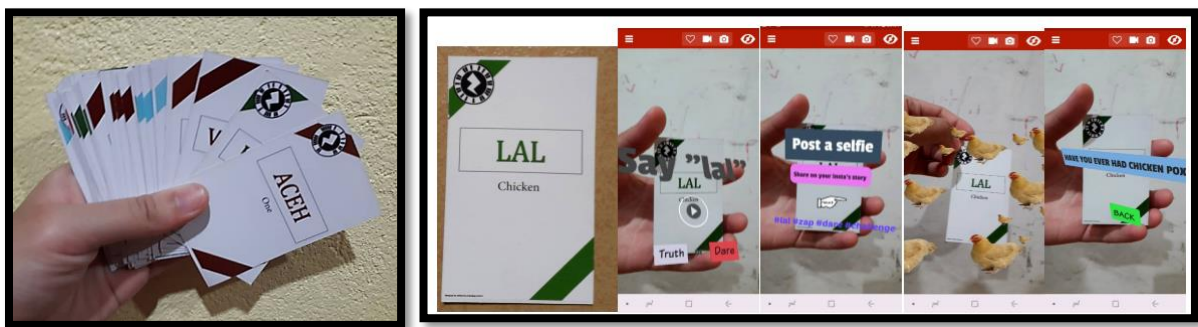


Figure 1. Example of how the learning card works

### Evaluation Results

The evaluation results on 15 teenagers revealed that the young learners are able to differentiate the pronunciation in Lun Bawang. For example, one of the respondents mistakenly pronounces the word 'kerubau' /kərubaw/ similar to the Malay language 'kerbau' /kərbaw/ and the other respondent help to correct the pronunciation then asked the friend to replay the audio and listen to it carefully. Later, the respondent pronounces 'kerubau' again correctly. With that, the added-audio feature of the AR-based learning environment allows learners to practice the pronunciation real time. At the same time, most of the learners learned new word. For example, the word 'tegangang' that means rainbow in English. They just find out that in Lun Bawang language there is a word for rainbow. They began to query and wonder about other more existed in Lun Bawang language. Other than that, one of the learners can identify the gender in Lun Bawang based on the word 'kinanak delai' and 'kinanak decur' which means brother and sister. The learners find out that the difference for 'brother' and 'sister' is just the word 'delai' and 'decur' and she understands that for a boy is 'delai' and for a girl is 'decur'. Moreover, interaction in the AR-based learning materials is important to attract the learner's attention. Interestingly, the learners are willingly and are able to memorize some of the numbers and words in Lun Bawang then relate it with their previous knowledge for the game. Therefore, the learners do find that the AR-based learning materials for Lun Bawang language is useful and at the same time interesting and fun.

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