

Learning Japanese language using augmented reality

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ABSTRACT – This study is about the involvement of technology in the education sector as a learning method which is using Augmented Reality (AR). AR is capable to display virtual objects which in 3D models to the user which adding the visualization in learning materials. Japanese is a language spoken by many people in Japan where it is their national language. People tend to travel to Japan and get to know the stuff and language in the country. However, most people learn the Japanese language just with notes, books, or videos and might find difficulties to get started with the Japanese language without visualization. This project will have features provided to the user to practice pronunciation with the environment scene using an Augmented Reality application. From the testing that had been conducted, this application shows that it can help people learning Japanese language in an efficient way.

1. INTRODUCTION

Japanese is a language spoken by many people in Japan where it is their national language. It is vastly get known by famous anime and movie for the young generation. Language skills are categorized into receptive skills of reading and listening and productive skills of speaking and writing. There are different types of roles in speaking whereas the role of speaking as interaction is mostly of a social conversation. It reflects the roles and the relationships of the speaker in a social setting. For example, chatting to a fellow passenger, asking for help, telling a friend about an amusing experience, et cetera are the interaction that the people conduct through speaking.^[1]

AR is an active computer application that provides more options for students in terms of interaction with the curriculum material rather than a passive mode of study. The elements of AR technology in education which drives its usability and popularity are to increase students' interaction and decrease students' cognitive load inherent in foreign language learning. There is 3 type of AR such as marker-based, marker-less, and location.^[2] AR systems merge computer-generated graphics with a view of the physical world. As a result, a quasi-experiment study to evaluate and investigate the effectiveness of AR tools to promote motivation and increase language learning.^[3]

1.1 Objectives

This project embarks on the following objectives:

- To study on the user experience and feature that improve interaction between the user with the application for learning Japanese language in augmented reality.
- To develop an augmented reality application that can help user to learn the basic Japanese language.
- To evaluate effectiveness of augmented reality in helping the user to learn Japanese language compared to the traditional self-learning way.

1.2 Problem Statements

The available learning materials are less attractive to users. The learning materials available such as textbook or notes in slide mostly just full of text and picture which is less attractive to the users. Besides, Most of the users are facing problems with different languages and unable to communicate with the local native speakers when traveling. People may face a problem when asking for help or asking for information when they are in need in Japan. Furthermore, users are hard to get started with the Japanese language without guidance. Many people did not know their problem in the process of learning vocabulary and pronunciation.

2. PROJECT METHODOLOGY

ADDIE methodology is applied in this system development. ADDIE is an instructional systems design framework that many instructional designers and training developers use to develop courses. The process will be separated into five phases that will contain several steps in each part shown in Table 1.

Table 1 ADDIE Methodology

Phase	Activity
Analysis	In the analysis phase, analysis was done to identify the need to develop the AR application. The analysis phase involves are requirement analysis, task analysis and instructional analysis. The activities involve are identifying the problem statement, the goals and objectives of the mobile AR application to be developed, the learners' need, existing knowledge and any other relevant characteristics and also the content of AR application.

Design	For the design phase, conceptual model and flowchart were developed. The design phase involves the development of the conceptual model for the AR application which involves the learning theory, the medium and AR technology to be used in the application.
Development	In the development phase, the process will proceed to the development of the modeling design, interface design, music background, sound recording and augmented reality production. The modeling design covers the features that available in the application.
Implementation	In this phase, the project will proceed with the testing to know the possibility of the product. After done with the testing and revised, it will enter the packaging stage where it will be implemented in the AR application tool.
Evaluate	In this phase, formative evaluation will be conducted prior to implementation in order to determine whether the quality of learning resources satisfies the standards established in the Design phase.

3. RESULTS AND DISCUSSION

Android is the main platform which involved in this project. This project will apply AR technology which aimed for android smartphone. Therefore, two types of SDK to develop the mobile application were used which are Android SDK and Vuforia SDK. [4] Vuforia SDK is used to create the AR scene in smartphone together with the Unity. Vuforia SDK is chosen for this project because it is free to use, open source and also easy to follow for beginner in order to develop an AR environment. [5]

Besides, the 3D models used in the application are modeled by using the modeling software called Blender while the 2D graphic such as icon and interface design is created in Adobe Illustrator and Adobe Photoshop. Blender is an open source modelling software which can model high quality 3D models. It is also a free to download that save the cost of the project. These productions of graphics lead to the combination with the AR as a result for the application. [6] The AR application must be installed in Android smartphone with the version of Android 4.4 KitKat or above. Figure 1 show the System Architecture for the AR application.

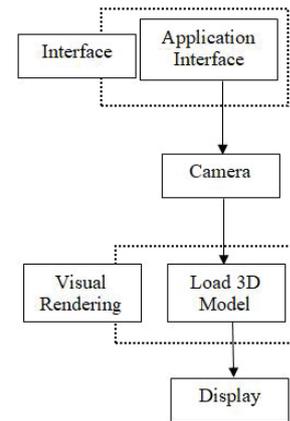


Figure 1 System Architecture

4. CONCLUSIONS

In conclusion, this project has been successfully developed to achieve the goal and objective stated above. This project is proposed to help the user to easily get motivated in learning basic Japanese language when they are in the environment scene which is restaurant and also accommodation. User can also get to know and learn the simple conversation when they are in need for ordering food or request for room service. For the future work, the application should include more vocabulary and more environment scene in order to give more in depth learning materials to the user to enhance the user experience. The proposed project will be further evaluated for the testing phase of the project.

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