

Development of a Mobile Application for English Language Learning Through Corrective Feedback



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Abstract Learning English as a foreign language is committed to using learning models that are linked to error correction by analyzing comments provided through corrective feedback to correct the error or to confirm the correct response. Having the chance to receive immediate corrective feedback allows students to be in contact directly with their learning process. This article implements an augmented reality application for learning English as a foreign language using corrective feedback and thus creating an accessible teaching tool that allows students to have additional teaching material to interact with the real world with virtual objects and animations. The application was designed by using Vuforia, Unity, Visual and Android Studio software. The objective of this article is to teach the student in an interactive way and consequently create a user-friendly link. The results show a great application in functionality using augmented reality for English language learning.

Keywords Corrective feedback · Augmented reality · Vuforia · Mobile application

1 Introduction

Knowledge and proficiency in the English language have become a fundamental necessity to meet the challenges of the twenty-first century. 1.5 billion people out of

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7.53 billion people who exist in the world speak English, according to [1], that is, approximately one in five people are dominant by English, and so if English is their second language, any professional will be given better opportunities in the personal and professional world.

Due to the above and with the advance in Information and Communication Technologies (ICT), new techniques and applications for learning English have been developed. As for the techniques [2], mentions four models for language improvement which focus on learning-acquisition, self-monitoring, entry and affective filter. The first model focuses on language learning in a similar way to language maternal naturally and unconsciously, the second one has to do with conscious learning which is exposed to the correction of errors, the third model connects the student with their next level of language proficiency and the fourth takes into account the motivation of the student. In relation to the second and fourth models both take into account corrective feedback and motivation through apps. Corrective feedback consists of making known the errors present in evaluation so that the student does not feel dissatisfaction or annoyance with the mistake made, on the contrary, this serves to motivate him or her not to commit it again [3]. The main advantages of corrective feedback are: It provides comments on the wrong answers. It keeps students informed about their academic performance. It fosters in students the interest in self-correction. It is timely because it intervenes at the right time. It is flexible since it is adapted to the level of the student. It uses technological resources to speed up their intervention and, above all, it contributes to the improvement of learning [4–8]. The Augmented Reality (AR) aims to combine images generated by electronic devices, on the real-world vision captured by one or several cameras of that device [9, 10].

In several educational and design applications, information that is associated with the real world is generated; it can be mentioned the 4D Anatomy application, which allows visualizing on a class book the anatomical parts of the human body with their names and main characteristics in a three-dimensional way [11], a design application that has been very popular in North America is IKEA Place, which allows placing furniture from your catalog in the different home spaces having a three-dimensional idea of the appearance of this furniture before being placed [12].

This article implements an application of augmented reality for learning the English language using corrective feedback, the application was designed with vuforia, unity, visual studio, and android studio software. The objective is to reach the student in an interactive way and thus to create a friendly link with the user, leaving aside the traditionalism of education. The article is organized as follows: Sect. 2 describes the materials and methods used, Sect. 3 shows the design and implementation, Sect. 4 shows the results and finally Sect. 5 provides the conclusions.

2 Materials and Methods

2.1 *Augmented Reality*

Augmented reality increases the images of reality, from its capture by the camera of computer equipment or mobile device that adds virtual elements for the creation of a mixed reality to which computer data has been added. There are four levels at which levels can be understood as a way of measuring the complexity of the technologies involved in the development of RA systems [13, 14].

2.2 *Vuforia and Unity*

Vuforia is an application for the development of augmented reality applications, it is a web environment where the users can create and administrate their markers. This app is the leader thanks to its exceptional technology of artificial vision, efficient tracking benefits and its compatibility with multiple platforms. It is the most used software for digital devices and sunglasses currently available in the market [15].

Unity is a 3D figure reader that uses C, C++ and C Sharp languages. In order to execute the projects from Unity to mobile devices, it is indispensable to have the appropriate software development kits (SDK) that enable their reading [15].

2.3 *English Language Learning with M-Learning*

Mobile learning can be defined as the educational modality that facilitates knowledge construction, learning problem solving and the development of different skills in an autonomous way through the interaction with portable mobile devices. The development of M-learning has resulted in the creation of multiple applications for English language learning, being the most important ones: Duolingo, Wibbu English, uSpeak.

2.4 *Corrective Feedback*

It is defined as the information given to the students about their academic performance, it can be used to correct errors or congratulate on a correct answer [16]. The corrective feedback should be coherent, dynamic, clear, frequent and proactive [17–19]. The corrective feedback is classified as follows.

Positive and negative: Named positive to comments based on the correct answers, and the negative is granted to the wrong answers [8].

Oral, written and mixed: The corrective feedback could be through the oral or written word, and the mixed one with the combined use of the previous two [20].

Explicit and implicit: The first occurs when the teacher identifies the error and directly provides the correct answer, and the second occurs when the teacher invites the student to find the correct answer [21].

Self-correction and peer correction: The self-correction provides the opportunity for students to address the correct answer for themselves [22].

3 Development of the Mobile Application

The following tools were used to perform the English test application with AR: vuforia analyzes the recognition of images, unity allows to develop the graphic environment, and android installs the application previously generated in visual as shown in Fig. 1.

3.1 Images Selection

For image recognition, the vuforia target image tool was implemented, this tool recognizes full detail images. The selected numbers obtained a result of 4 stars so, they will have easy recognition when executing the augmented reality application. The numbers selected to perform the application are those shown in Fig. 2.

Once the images are selected, each of the numbers is imported into vuforia, to generate the points that allow recognizing the characteristic patterns of the image, this analysis is carried out in grayscale, in this instance the image qualification is generated obtaining 4 stars as shown in Fig. 3.

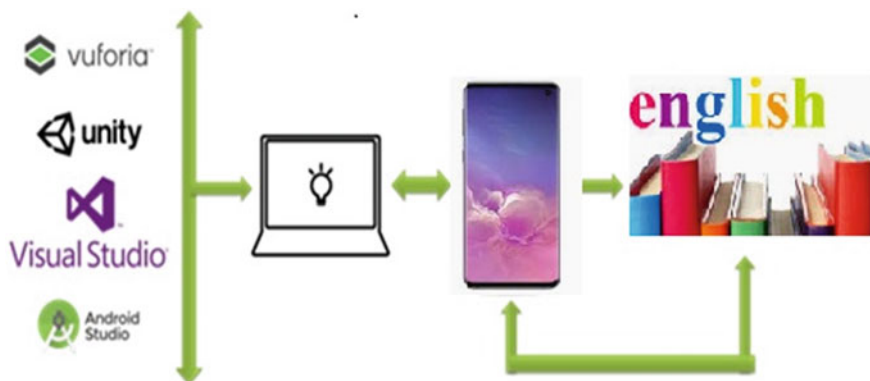


Fig. 1 Implementation of the application

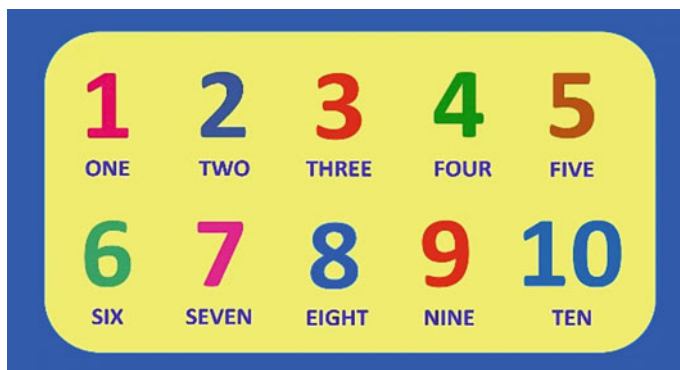


Fig. 2 Numbers selected for the augmented reality application

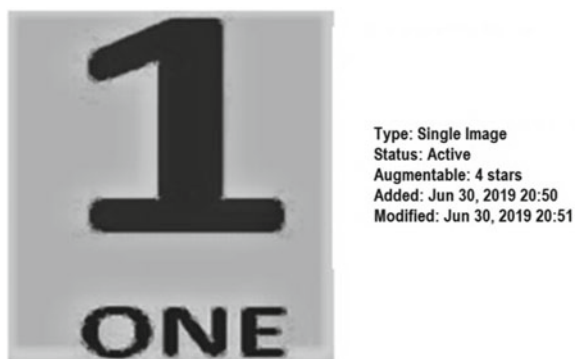


Fig. 3 Image recognition points

3.2 *Application Development*

The images must be imported to Unity where the application screen is configured with a resolution of 2200×1400 pixels because it is the standard size of the screens, in addition, this measure allows us to run the application on higher resolution screens. Each image was assigned a scene of its own, each question has its own interface, where the texts of the application, theme, question number, answers, option buttons for correct or incorrect answers and feedback animations are generated as shown in Fig. 4.

Through Visual Studio, the feedback animations for correct or incorrect responses were programmed, this algorithm remains active for 2 s and then becomes invisible so that the user can practice several times until the topic is understood.

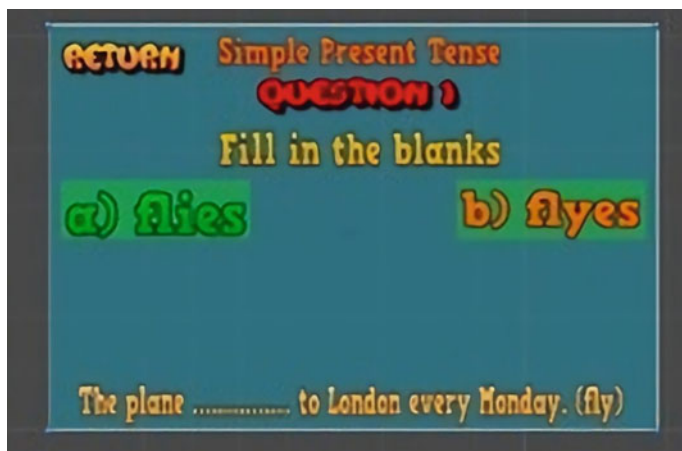


Fig. 4 Development in the unity program

3.3 Simulation of the Application

Before installing the app on the Smartphone, simulation in Unity is performed. Once the correct answer is chosen the app displays the message “Correct” within the check icon and a happy face as shown in Fig. 5.



Fig. 5 Correct answer feedback

4 Results

Next, the apk file, English Test.apk, is generated. Finally, the application is built thorough the Android Studio platform and now is ready to be installed in a Smartphone. The application contains 4 types of questions: Fill in the blanks, Multiple Choice, Structure Sentences and True or False. The type of questions used on the application responds to the advantage of using accurate content on learning, an appropriate technological medium, and proper monitoring of the academic progress. Figure 6 shows how the application works for Multiple Choice questions. The first step is to run the application on the smartphone, the next step is to focus on any number belonging to the database. Finally, the question is shown.

In the last figure the option “ANSWER ME” is displayed, in which you click on and the different options appear depending on the type of question. Then the student chooses whatever option and up to his answer a message is showed if the choice was correct or incorrect with the corresponding feedback as it is seen in (Fig. 7).

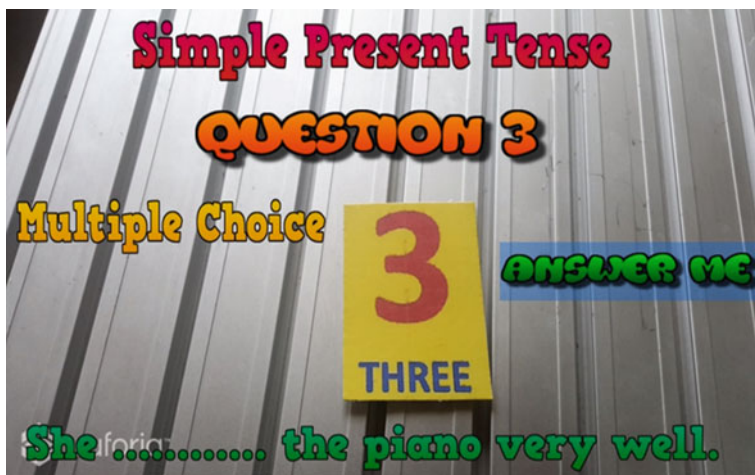


Fig. 6 Development of the unity program application

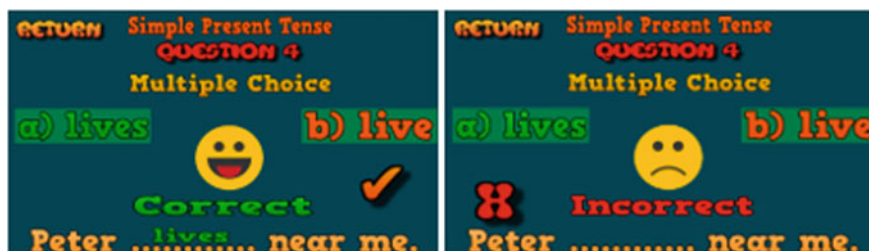


Fig. 7 Feedback for answers

The functioning application results show that it is very friendly with the user and considers advantages of corrective feedback for learning of the english language.

5 Conclusions

The English learning application as a foreign language using augmented reality is an approachable and didactic tool that allows students to have extra didactic material in order to interact with the real world through virtual objects and animations. An important fact of the application is that it can be installed in whatever mobile phone without being limited to the operative system so it can be set up for multiplatform systems.

The corrective feedback represents support for the English learning process since it allows students and teachers to have the possibility of being informed about the academic advance as well as it encourages students to be more participative through the error correction or the verification of the correct answer. If the answer is correct feedback allows students to confirm their response or if it is incorrect error correction motivates students to look for the right response.

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