Application of Augmented Reality for the Development of Skills in the Communication Area

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Abstract. The role of technologies in education is fundamental and is in continuous use today by educational systems as a recreational and educational tool, to improve the management of student learning. Likewise, the integration of Augmented Reality is valued, as an emerging technology with strong application possibilities in the educational field to improve reading comprehension. Therefore, different 3D models are used as an educational resource and are visualized through the Unity and Vuforia software; In the investigation it was achieved that of 27 students at the literal level 59.26% were improved, at the inferential level 44.44% achieved this level and at the critical level 40.74% obtained better results. Therefore, interactive reading is proposed as a strategy to improve skills in the area of communication.

Keywords: Augmented Reality · Reading Comprehension · Oral Expression · M-Learning

1 Introduction

New technologies are a fundamental axis in society with an increasing influence in all contexts, which is why the demand for educational innovation captures the attention of the student. In the present work it was decided to use augmented reality to support reading comprehension and oral expression in students of the V cycle of primary education through interactive readings.

In this sense, augmented reality (RA) applications will be a great ally by allowing the incorporation of 3D elements. The main feature of this application is based on multiple representative objects of the readings, motivating them in this way in their learning, in addition to covering the National Curriculum of Regular Basic Education of the communication area strengthening the skills: Read various types of text in your mother language, communicates orally in your mother language, enhancing your learning through the use of augmented reality. In 2018, Minedu conducted an evaluation in reading where 34.8 % is at

the beginning level, 30.9 % is in process and 34.8 % reached the satisfactory level in elementary students , observing an improvement in the evaluations of the ECE tests, that is why it is essential to continue reinforcing their learning through strategies using augmented reality [7]. The use of this tool will optimize the development of their skills in the students of the V cycle of Regular Basic Education. In the first section the preamble of the subject is given, in the second related works, third theoretical foundations, fourth the RA as a didactic resource, in the sixth the research proposal, we finally culminate with the results of the project.

2 Related works

In 2019 Burson, Hamiyet; Yilmaz, Rabia Meryem *Effect of augmented reality applications on reading comprehension and permanence of high school students' learning* The purpose of this research was to analyze the effect of augmented reality applications on reading comprehension by examining student attitudes towards students Fifth grade, the method used was mixed, with a sample of 89 5th grade students (43 girls, 46 boys), the experimental group participated in reading activities using AR applications, while the control group used traditional methods, observing that the students of the experimental group improved their level of reading comprehension, experiencing satisfaction for their participation in interactive reading activities based on AR, these qualitative results indicate that AR applications can be used effectively as educational aids. [2].

In the 2017 Kun-Hung Cheng *Reading an augmented reality book: An exploration of learners' cognitive load, motivation, and attitudes* in this research work, it has been increasingly applied in education recently, the research of Student learning experiences with RA could be useful for educators to implement AR learning. With quantitative surveys using three questionnaires, this study explored the relationships between perceived cognitive load, motivation and attitudes of perceived control, perceived utility, and learning behavior of RA of 153 students, when they participated in an AR reading activity . The results indicated that, in general, students perceived less cognitive load, greater motivation and more positive attitudes towards the experiences of reading an AR book and that after reading the AR book, the students were willing to learn with the help of AR technology in the future, however, were relatively less willing to seek more information on the subject of the AR book [3].

3 Theoretical fundaments

3.1 Reading comprehension

Reading comprehension is the ability of an individual to capture as objectively as possible what an author has wanted to convey through a written text. Reading skill is the ability of a human being to use his reading comprehension productively in the society around him[6]. In this way, reading comprehension is the

abstract fact dependent on the individual training of each person and the reading skill the concrete materialization carried out depending on the individual's relationship with society [10], [13].

3.2 Communication Area Skills

Read various types of texts written in your mother language This skill is defined as a dynamic interaction between the reader, the text and the sociocultural contexts that frame the reading. This competence involves the combination of capabilities as it obtains information from the written text, inferring and reflecting on the content [7].

4 Augmented reality

In recent years, one of the so-called emerging technologies is Augmented Reality (AR), which is presented as a digital resource in teaching and learning, its link implies an improvement in the imprint of the education system [4].

Augmented Reality may not be the ideal solution for all the needs of educational applications, but it is an option to consider [4] The use of RA is becoming increasingly extensive, this technology offers to improve the cognitive processes applied to teaching [1]

4.1 Augmented reality development tools

Unity 3D UNITY is a development engine for the creation of interactive 3D games and content offering countless functionalities to facilitate the development of video games, using Smartphones, web browsers, Xbox 360, Wii U and PS3, among others, where you can develop games that range from MMOG, up to role plays. [5].

4.2 Augmented Reality in Education

The use of RA in different disciplines is becoming increasingly extensive, not only because of its potential but also to improve the cognitive processes applied to teaching.[12]. This technology present in educational applications can be related as a motivational tool for students, which helps to improve attention and with it learning.[8].

The ability to insert virtual objects in a real environment has made the RA a very advantageous tool to present certain contents under the premises of entertainment and education. [14],[11] .

5 Proposal

The research is based on an explanatory Pre-experimental study of quantitative character, with the aim of improving the levels of reading comprehension in the students of the V cycle making use of augmented reality, the scientific method will be used to measure the levels of understanding reader, as well as the inductive method, deductive method, analytical method and synthetic method. The stages of the study are shown in the figure 1

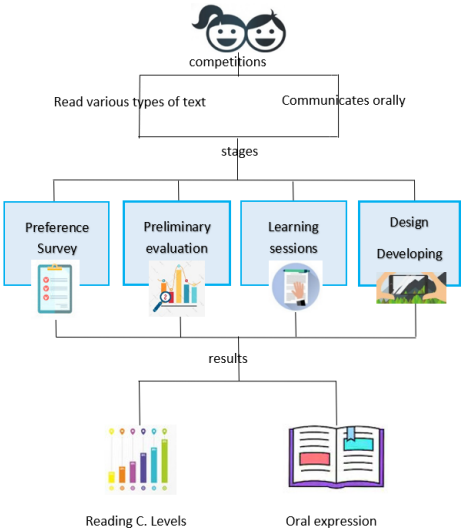


Fig. 1: Activities of the proposal

5.1 Skills Selection

For the requirements requested by the Ministry of Education, we rely on the National Curriculum, for the investigation two skills of the communication area will be selected to begin with the development of the proposal:

- Read various types of text in your mother language.
- It communicates orally in your mother language.

5.2 Preference Survey

Instruments such as preference surveys are developed to know what kind of literary genre students are inclined to be fantasy, science fiction, adventure,

essays, stories or fables, also suggestions of literary works to encourage them in readings such as the Odyssey. Moby Dick, the Little Prince and my Orange Plant Lima. The purpose is that through your preferences we choose the appropriate reading, being this "The Little Prince".

5.3 Preliminary evaluation

For the preliminary or diagnostic evaluation, a test is prepared where the levels of reading comprehension are measured, the literal level with three elements that have as indicators to recognize successions of facts, the inferential level with three elements measured by the indicators to deduce the Cause-effect relations of the text and the critical level with two elements, its indicators were to interpret and communicate the purpose of the text. The preliminary evaluation seeks to detect the level of understanding, difficulties and achievements in this process for each student.

5.4 Learning Sessions

Obtained the results of the preliminary evaluation, we dose in each learning session the pedagogical processes in the area of communication, for the V Regular Basic Education cycle, selecting from the National Curriculum Design, the skills, abilities and performances, to reinforce with the students reading comprehension levels, their accompaniment before, during and after with the reading "The Little Prince", and the respective 3D models. 10 learning sessions were developed,

5.5 Design and development

For the design of the app "Virtualecto" a sketch was made to understand the system, making use of the Mockup program, greater precision was achieved for the operation of the application, adding that it must go as an image, the order of adventures, the displacement of icons, the position of the gallery, the location Each adventure book shows a recreation of the stage by reading chapters of the camera to show the 3D model through QR code. 2a, Each adventure book shows a recreation of the stage by reading chapters.

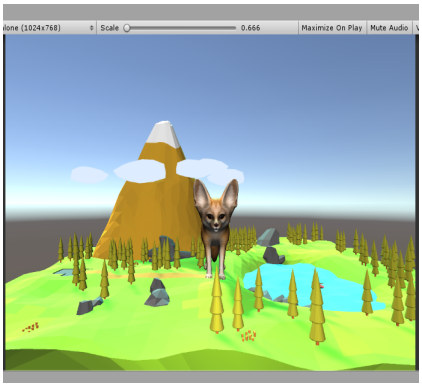
The selection of designs, elaboration of characters in UNITY in 3D for use with augmented reality are designed so that the student engages his reading comprehension and improves his oral expression, then one of the characters of the reading in the figure 2b

For Vigotsky, strengthening the previous knowledge that is acquired thanks to the experiences that arise in daily living, refers to the social level, constituted by social interactions [9].

5.6 Evidences

With the product of each learning session, each student's photo gallery will be provided, as shown in the figure 3a,preparing with them an album, which will

(a) Development in Unity for the visualization of adventures of the Little Prince



(b) View of development in Unity of Fox model

Fig. 2: Caption for this figure with two images

be used as a material to strengthen the skill of oral expression in the classroom, we have as an example the figure 3b

(a) Interaction with 3D model

(b) Activities of the proposal

Fig. 3: Images of evidences of each learning session

6 Results

For the validation of the research proposal, students belonging to the " German Private Educational Institution, Christus Rex " were used as a sample, with a total of 27 students, of which 15 are men, 12 women of the V cycle.

The instrument that was applied was an entrance test (Pretest) and a final test (Postest).

In the table 1 the following result is obtained 0.762 then following the established criteria it can be seen that the level of reliability of the instrument is high.

Table 1: Crombach Reliability Statistics

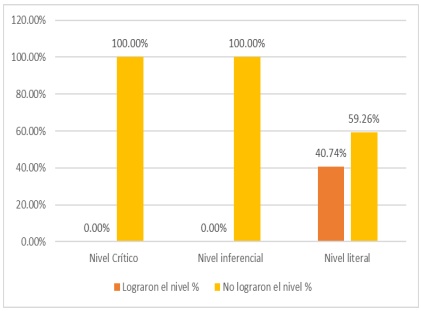
Reliability statistics	
Cronbach's alpha	**N of elements**
0.762	8

In the table 2 and Fig. 4a of 27 students of the V cycle representing 100% of the sample, the frequency distribution of the comprehension levels in the experimental group of the Pre-test is observed, it is perceived that 59.26 % did not reach the literal level, only 40.74 % obtain this level, inferring that students seek their answers in a textual manner, therefore they had difficulty in reaching the inferential and critical levels.

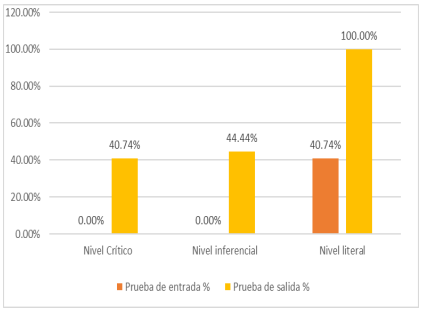
Table 2: Pre test Applied to students of the V cycle of the I.E. Americano Germano Christus Rex

	Pre test		**Post test**	
	f	**%**	**f**	**%**
Critical level	0	0.0	27	100.0
Inferential level	0	0.0	27	100.0
Literal level	11	40.74	16	59.26

In the table 3 and figure 4b of 27 students of the V cycle representing 100% of the sample, the frequency distribution of the levels of comprehension is observed in the experimental group of the Pos test perceiving that in the pre-test at the literal level they obtain 40.74 %, after the use of the application the students successfully obtain the literal level, improving the deduction capabilities by 44.44 %, and reaching the critical level at 40.74 % improving your critical and evaluative thinking.



(a) Pre test analysis Applied to students



(b) Post test analysis Applied to students

Fig. 4: analysis Applied to students of the V cycle of the I.E. Americano Germano Christus Rex

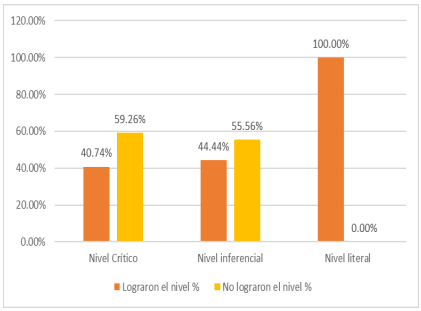
Table 3: Post test Applied to students of the V cycle of the I.E. Americano Germano Christus Rex

	Pre test		**Post test**	
	f	**%**	**f**	**%**
Critical level	0	0.0	11	40.74
Inferential level	0	0.0	12	44.44
Literal level	11	40.74	27	100.0

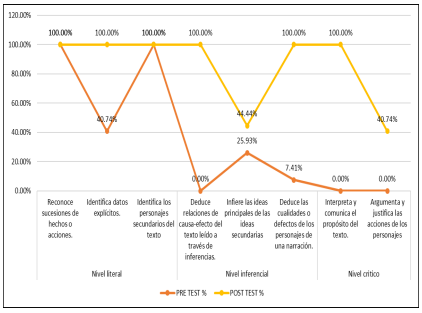
In the table 4 and figure 5a the frequency distribution of the reading comprehension levels is observed by comparing the experimental group in the Pre test and Post test, in the students of the V cycle they obtain to reach the satisfactory literal level, of 100 % of the population 55.56 % are in the process of acquiring the inferential level unlike 44.44 % that reached this level, 59.26 % in the process of acquiring the critical level unlike the 40.74 % that obtain the level.

Table 4: Pre test and Post test applied to students of the V cycle of the I.E. Americano Germano Christus Rex

	Pre test		**Post** test	
	f	**%**	**f**	**%**
Critical level	11	40.74	16	59.26
Inferential level	12	44.44	15	55.56
Literal level	27	40.74	0	0.0



(a) Post test and Pre test analysis Applied to students



(b) Ogive indicator of the results applied to students

Fig. 5: Analysis with indicator applied to students of the V cycle of the I.E. Americano Germano Christus Rex

The results of the comparison between the data before and after the test are shown in the figure 5b. it was difficult for 40.79 % to find explicit answers, however, in the subsequent test it successfully improved to 100 %, optimally reaching the literal level; 25.93 % find it difficult to find deductions within a text when seeing this in the previous test, in the subsequent test 44.44 % reached considerable deductions and inferences within a text, however problems are identified at the critical level in the pretest , improving in the posttest with 40.74 % improving when making judgments and arguing their answers.

A partir de los resultados obtenidos, podemos deducir que el uso de la realidad aumentada mejoró los niveles de comprensión lectora, considerando como uso de estrategia didáctica para estudiantes en su proceso lector.

7 Conclusions

This research shows us that the application of augmented reality, as a tool, improves the skills in the area of communication, reading comprehension and oral expression, for obtaining an advance in the development of student learning in the V cycle of Regular Education basic

In the quoted paper [2], he explores learning, cognitive load and skills from a qualitative part using an augmented reality book according to the identified variables, instead in our proposal he seeks to motivate reading and improve the understanding of communication skills in students Primary level.

In the paper cited [3] improves reading comprehension with augmented reality in their abilities in general, obtaining an improvement of 14.62% in the area of communication, however their pretest results showed us that they already had advanced levels of reading comprehension, instead in Our research students begin with very low reading comprehension levels and progressively improve each level, also obtaining a book made by students showing the interaction with their 3D models.

8 Agradecimientos

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