



# Development of Interactive Story Tales Using MIT App Inventor

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**Abstract.** Today mobile technologies have become essential in people's lives. The use of smartphones and tablets has increased in times of pandemic due to their low cost, ease of use, ubiquity, portability, communication, and interactivity. Reading habits have changed significantly in favor of the digital format. This article describes a study to identify the way children from 8 to 12 years of age read on smartphones. The study was carried out in three phases: the first where an instrumented inquiry was carried out, collecting and analyzing data by applying a diagnostic test to 20 students; as well as a survey of 20 parents and 4 teachers in the language area. In the second stage, with the information collected, mobile educational resources were designed based on unpublished stories and activities focused on four language skills (reading, speaking, listening and writing). In a third stage, an intervention was carried out using the Thinking Aloud technique. The students were separated into two groups, 10 of them participated in a virtual session and 10 in a face-to-face session. In both cases, the results showed some reading habits as well as interest, motivation when there are interactive resources.

**Keywords:** Mobile resources · Reading habits · m-learning · Thinking Aloud · MIT App Inventor

## 1 Introduction

Reading is an essential act for human beings, because through it each individual knows better who he or she is and where he or she comes from. Through reading we can transform the real and imaginary world, awaken curiosity, stimulate the imagination, help develop creativity, so the promotion of reading has to be a priority in education to provide a cultured society. However, developing countries such as Ecuador still have problems of illiteracy, which is one of the greatest challenges for the education system. Ecuador has a literacy rate of 92.83% and is ranked 81st in the literacy ranking [1]. According to the latest data published by UNESCO, 26.2% of Ecuadorians do not dedicate time to reading, of which 56.8% do not do so due to lack of interest and 31.7% due to lack of time

[2]. These statistics are the result of a problem that starts at an early age with the lack of reading habits and continues in many cases until adulthood. The lack of reading habits in Ecuadorian students is reflected in the results of evaluations by various organizations such as The Programme for International Student Assessment (PISA), a worldwide test developed by the Organisation for Economic Co-operation and Development (OECD) [3].

In relation to this problem, a study proposes that it is necessary to develop a new pedagogy for the development of reading competence, taking into account the current technological challenges [4]. These challenges constitute an opportunity to develop some skills with the use of technology. For example, one study investigated how to expand linguistic vocabulary through reading electronic stories. The authors start from the premise that children have a limited vocabulary due to low reading motivation, therefore, the objective was to propose the intervention of electronic stories, applying a random sampling design with pre- and post-tests, obtaining as results the lexical development and comprehension of literary texts [5].

In the same way, a study analyzed the use of cell phones and their impact on reading habits. To this end, the authors conducted data collection through interviews to identify the real problems of the reading process. The authors determined that reading spaces are often boring, and therefore assume that the development of a digital reading may be more advantageous [6].

Other authors were able to determine the application of cognitive strategies for the development of reading comprehension skills through stories, through the implementation of cognitive strategies. The methodological approach emerged through the analysis of perceptions by means of the diagnostic evaluation of various linguistic criteria. The results show that an adequate cognitive process strengthens reading processes [7].

In relation to the teaching of reading at early ages, one study explored the initiative of a reading instruction time policy and discussed how it was developed and secured in early grade classes. Reading, as a cognitive process, is considered to require effective time allocation. The researchers were able to determine the importance of instruction in improving performance standards and achievement in reading skills [8].

Teachers use storytelling as a powerful literacy tool that engages children in making connections between academic content and pedagogy. This strategy is also useful for integrating classroom diversity. Increasing or varying the types of materials available to children is another way to make the classroom more inclusive [9].

All these studies highlight the importance of motivating reading processes, gradually responding to technological challenges and seeking new ways to link learning and reading. Reading motivation through mobile educational resources becomes important, since it goes beyond conventional reading methods, and new ways of motivating and innovating linguistic skills development in reading are sought. The following section describes the research process to carry out this study.

## 2 Method

The research is of a descriptive level, under a mixed approach with a sequential design in two stages; the first stage with a quantitative approach, where an instrumented inquiry

is carried out, collecting and analyzing data using instruments; In the second stage, a qualitative approach is applied, it is oriented to the design of the strategy as a proposal to the problem, where the use of empirical methods is applied, for the processing and collection of data, carrying out an analysis and interpretation of results.

## **2.1 Participants**

The population of this research study consisted of 4 teachers from a regular education school in the province of Imbabura in Ecuador and 20 students between eight and nine years of age, in the fourth and fifth grades of general basic education. On the other hand, the participation of 20 parents was considered.

## **2.2 Materials**

The research process was supported by the use of different materials and instruments, among the material resources were the computer, cell phone with internet, web 2.0 resources. While among the instruments in the study were: a survey to teachers, with a structure of two open questions and eight closed questions with Likert scale. Also a survey, with a structure of two open questions and eight closed questions with Likert scale for parents. Finally, an observation guide made to students, with a structure of 10 questions with a Likert scale. The execution of the instruments is applied through the digital tool Google Forms. The data collection instruments applied to the study population were subjected to validation through Cronbach's Alpha, this validation process ensured the reliability of the internal consistency of the instruments.

## **2.3 Procedure**

The research applied a survey to teachers, in order to identify their digital skills through the use of mobile educational resources, as well as to determine the motivation methods and reading processes that they apply with the students. Next, a classroom observation was carried out on the students to determine their levels of motivation to read, based on the educational processes applied by the teachers. In addition, a survey was applied to parents, in order to validate their satisfaction in the teaching-learning process of their children, and their openness to the implementation of mobile educational resources in the reading training processes. Finally, the Thinking aloud technique was used to evaluate the prototype of the mobile educational resource.

# **3 Development of the Mobile Educational Resource**

The implementation of the design and programming of the mobile application "Fantastic Mobile Legends of Milo and Anilu", was developed in different stages:

In the first stage, the linguistic macro-skills needed to develop literacy skills were identified, including reading, writing, listening and speaking. In the second phase, different activities and mobile educational resources were analyzed, through four captions, which were integrated into the development of the mobile application with MIT App



Skill	Digital Tools	Activities	Prototyping
Reading		<p>The mysterious lady                      The duenditas.                      The golden chicks.                      The Virgin of Peace</p>	
Writing		<p>Guess, guess                      What legend am I?</p>	
Listening		<p>Interactive video.                      Image game.                      Maze game.                      Alphabet soup.</p>	
Speaking		<p>What am I left with?</p>	

Fig. 1. Activities and digital tools for macro-skills.

Inventor. Playful activities were integrated such as: image games, maze, word search, videos; through digital tools such as: Quizz, Kahoot, Padlet, H5P. Figure 1 shows a summary of the activities for each skill and the web 2.0 tools used.

In the third stage, the App Inventor platform was used for developing the App, which allowed integrating the four macro-skills (reading, writing, listening, speaking), through web 2.0 educational resources. The Fig. 2 shows a screenshot of the App.



**Fig. 2.** The main and menu screens of the App.

The interface has four buttons that were programmed so that each one directs to the screen where the captions are located. When a legend is selected, the text is presented and buttons at the bottom to select the activities.

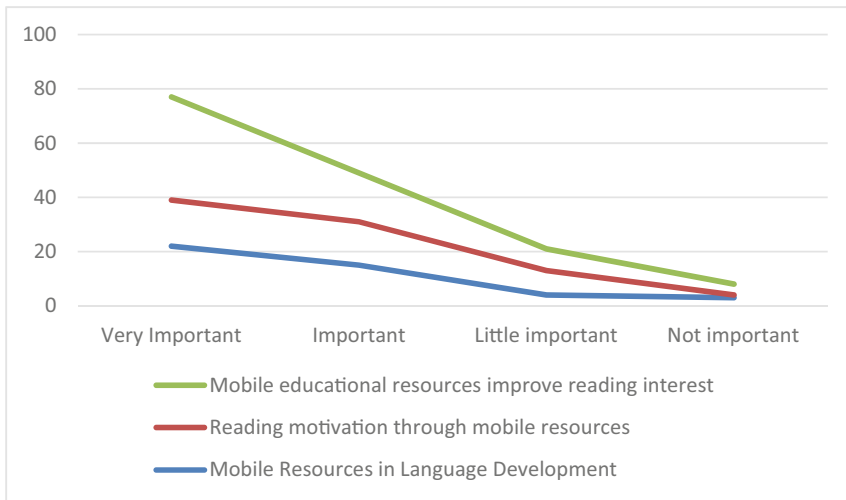
Following a design thinking methodology proposed by Jadán-Guerrero for the development of hybrid interfaces and educational resources for children, educational resources developed in other web 2.0 platforms were embedded and activities were integrated with hybrid educational resources such as reading QR codes [10].

In the four stage, the implementation of the proposal, the students had two modalities, one virtual and one face-to-face. In the virtual modality, students used smartphones, tablets and other mobile devices at home with the help of their parents. While in the face-to-face modality, worksheets were used with the help of a teacher. In both cases the educational resource developed was evaluated with the Thinking Aloud technique, which allowed improving the interface of the developed prototype.

## 4 Results

Based on the results obtained, it is evident that teachers use conventional educational resources, which have been used frequently, producing a disinterest in the student in the learning process, specifically in reading; Therefore, this research is feasible, since there is a lack of knowledge of the great variety of digital tools to induce spontaneous reading, it is important to motivate reading through mobile educational resources, enabling young students to function in an educational setting, more dynamic and interactive reading, strengthening the four linguistic macro-skills (reading, writing, listening, speaking).

As mentioned by [11] the importance of motivating reading and strengthening linguistic skills, through the use of digital narrations, which facilitates learning and expansion of vocabulary, as well as assertive expression, all of this will be supported by the effective use of learning environments, as a means to motivate reading processes. Likewise [12], they explored the incidence of online readings, for the motivation to read, promoting active participation by students, who are part of a new reading experience in the educational setting. Once the analysis of the research results has been carried out and complemented with contributions from specialists, Fig. 3 highlights the most relevant results.



**Fig. 3.** Relevant results.

## 5 Conclusions

The students, once the mobile educational resources were applied interactively, had motivating reactions in the learning process, where they expressed their thoughts, referring to the fact that the application interface is very friendly, which is why there is greater attention and interest in the innovative proposal in the reading learning process development in its four macro-skills.

The execution of the mobile application proposal “Fantastic Mobile Legends of Milo and Anilu”, was very useful, by offering a variety of dynamic and interactive activities and easy access, the students felt extremely familiar, generating reading emotions.

The reading motivation processes used by teachers are based on classical methods that are not very dynamic and attractive, since it is usually the teacher who fulfills the role of generator of new knowledge and not the student, for which the teacher is the one who must promote educational resources that generate motivation.

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