

# Android app for Teaching and Learning Math for Elementary School Children

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**Abstract**— *The present work has as main focus the demonstration of the use of an android application as mediator and facilitator of the knowledge of mathematics for elementary school children using concepts and techniques of computational intelligence implementing the model of expert systems.*

*For this the application will be developed in java using the android platform in order to accompany the great expansion of current technological tools such as games and multimedia applications because they are portable and facilitate the use at any time.*

*With this, it is expected that the application will be of great use for students and teachers since they have assisted in teaching through methodologies and technological education merged in elementary schools.*

**Keywords**— *application, mathematics, technological education.*

## I. INTRODUCTION

Faced with the accelerated growth of information systems in many industries, intensive study is required on existing forms of security to make software more reliable. There are several ways to effectively and efficiently meet these needs. However, the big point in question is the investment needed to use these methods and protocols, and in the last decade the studies have faced an even greater challenge: the search for low-cost technologies, but at the same time a rate high security.

With this, the application will demonstrate the use of knowledge in fundamental level mathematics with technological resources to facilitate the user's learning through the playful and ways to motivate the user to continue through training, tests that will be treated in games situations that is the great with the expansion of Information Technology.

According to Martins, De Souza Rebouças and Alves (2015) "Today's children and youngsters are considered

digital natives because they were born in the digital world and, therefore, feel totally at ease with technology."

Martins, de Souza Rebouças and Alves (2015) also affirm that the Tablet is a resource that is widely diffused in technology and its use is increasingly common.

De Melo Fernandes and De Souza Rebouças (2016) consider that "Mathematics is an area of knowledge of fundamental importance in our lives. [...]".

For Garcia (2009) mathematics develops logical thinking, helps solve problems and is useful in social life. According to Garcia (2009), mathematics is taught to give young people opportunities to compete in the labor market, since they are present in all types of competitions and selection tests.

With this, it is possible to identify ways of improving education through technology since the teaching of learning is outdated and a modern era.

According to the website Todos pela Educação, only 9.3% of students in the 3rd year of high school had expected mathematics proficiency in 2013, while 16.4% of students in 9th grade had expected proficiency in Mathematics.

Thus De Melo Fernandes and De Souza Rebouças (2016) argue that a possible proposal to minimize this problem is the use of educational software in the classroom.

With this the present paper focuses on showing the possibility of using technology in educational environments through applications.

## II. MATERIAL AND METHODS

For this tool will be used the programming language java enjoying the resources of the IDE Android Studio where it allows the development of mobile applications for the Android platform.

This can use the hardware features of the various mobile devices that are generally used, thereby ensuring portability, ease of use and flexibility as the technology is found and can be accessed on minimized devices.

## 2.1 THE DEVELOPMENT ENVIRONMENT

According to AS FAQS (2016) Android Studio was announced in 2013 at the Google I / O conference, based on Eclipse, which is the environment for application development heavily used by developers. So with Android Studio, Google reconciles the IDE to the development of applications, and so develop specific tools adapted to the part with version support.

Currently, Android Studio is the platform postulated as the most complete IDE for developing many feature-rich Android applications that stand out from the other programs used for this work, is based on IntelliJ and can be downloaded for free through the Apache 2.0 license.

## 2.2 COMPUTER SCIENCE IN TEACHING

Some mathematical educators have been dissatisfied with how content has been worked in the classroom, which has expanded the search for new ways to make its teaching really relevant to the transformation of the individual and of society (Pinho et al. 2008).

Therefore, Pinho et al. (2008) states that computing brings a new way of teaching, through a dynamic in which the student, when interacting with the software, can increase their motivation and achieve a significant improvement in their learning. One way to promote this is through m-learning, or mobile learning, which consists in the use of wireless networking technologies to spread teaching and learning, further facilitating access to information (Oliveira et al., 2007).

The Information and Communication Technologies (ICT) has been seen by several researchers as tools capable of facilitating students' learning, providing critical discussions and analyzes for the construction of knowledge by the learner. (Ponte et al., 2003).

In this way the act of learning is linked to the curiosity and the situations that foment and instigate it. The stimuli are fundamental to make the teaching and learning process come true (SAVATER, 1998).

According to Valente (2003), one does not have to be a "computer expert, technical and pedagogical knowledge, can be built together". "The mastery of techniques happens due to the need and demand of the pedagogic and the new technical possibilities create new openings for the pedagogic". (VALENTE, 2003, p.22).

With this, it is possible to affirm that instructional software does not provide the student with explicit thinking, the teacher needs to use practices that emphasize the formalization of knowledge, accompanying and encouraging the student step by step in the learning process. (ALMEIDA, 1994).

In order for the knowledge to be explained, it is the teacher's duty to measure methodological techniques for student learning and thus to provide information in a clear way, taking into account the current needs where the use of technologies is proposed as an educational tool.

Silander and Rytkönen (2005) believe that mobile devices define a new dimension in education, especially by allowing learning in specific contexts, easily extendable to the real world.

The computer is not just another powerful educational tool. He is the only one to allow us the means to address what Piaget and many others identify as the obstacle that must be transposed into the passage from infantile thinking to adult thinking. . . . Knowledge that was only accessible through formal processes can now be concretely addressed (PAPERT, 1997, p.37).

For Brazil (2002, p.117-118):

"To follow critically the contemporary technological development, making contact with the advances of the new technologies in the different areas of knowledge to position itself in front of the current issues" (BRASIL, 2002, pp. 117-118).

With this it is possible to note which technologies become important for teaching and learning in the development process of a child and to incorporate such means in the education system becomes necessary since it has the potential to obtain great results through the ludic.

## 2.3 CREATE NEW TEACHING METHODOLOGIES

For the adaptation of the tool in elementary education will require the support of the pedagogy that resides in the college that will use the application. In this way new teaching methodologies can be applied satisfying the needs of student evaluation, once the application provides this method.

Soon teachers will be able to teach evidence in view that the tool has a friendly layout of easy understanding and basic functionalities for pedagogical support.

## 2.4 TOOLS OF LAYOUT

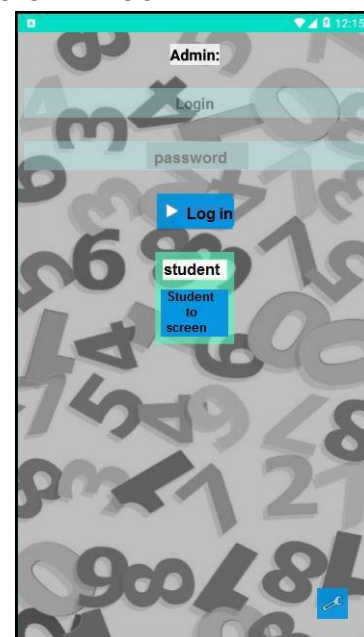


Fig.1: Initial Screen.

Source: The authors.

The initial screen serves to authenticate the different levels of users, the background lists numbers for the user to identify that it is mathematics, a user and password are provided by registering who to use the application.

Soon the application will be enabled to receive registrations of students considering the tests in the classroom with teachers and pedagogues evaluating the performance of the tool

Given that the tool will work with different levels of users, it will be able to show different views as shown in Figure 2, where some items are observed for the student that can perform questionnaires, tests and verify their status (individual performance in relation to their studies).



Fig.2: Student Vision.  
Source: The authors.

For an autodidact control, a feature is shown as a way of updating the registration data of the person who accesses the tool, in it it is possible to find items such as login, password, name, date of birth both as needed, an example is shown in figure 3.



Fig.3: Change of data. Source: The authors.

This allows the user to have flexibility to manage their data as it is of great importance to the administrators of the tool who need updated data, when it comes to methodologies in public or private schools these details become very important since they will be detailing performance of students who may or may not be linked in a class that is being used in a school.

The administrator who teacher characteristics may have will have a differentiated view in order to grant privileges such as adding and modifying questions, users, classes and tests as well as listing the questions used, users as enrolled in the database the existing classes and also the evidence released by him. An example is shown in figure

4.

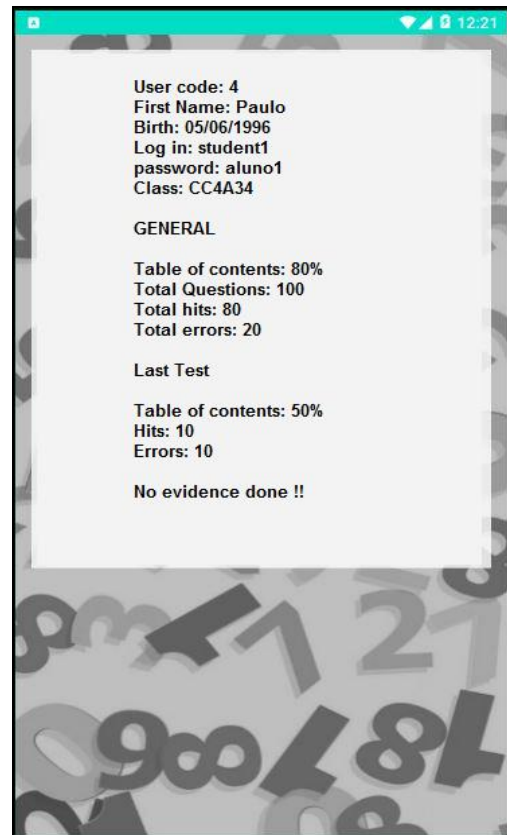


Fig.4: General Indicators.  
Source: The authors.

Another very important item that serves as an indicator for pedagogical improvements in the teaching of mathematics at the fundamental level is the general status present in the administrator's view, whose main objective is to balance between classes and students showing performances such as correct questions, wrong with percentages which can define frameworks of methodologies in teaching. An example is shown in figure 5.

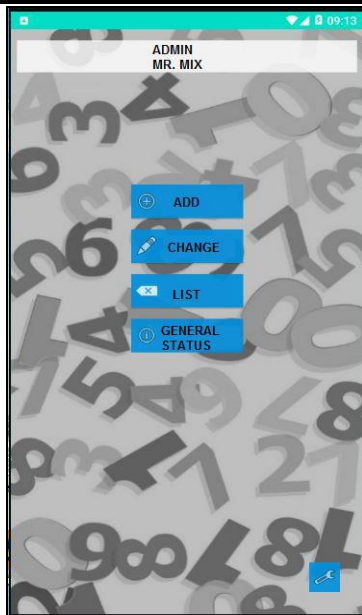


Fig.5: Administrator roles.

Source: The authors.



Fig.6: Student Questionnaire.

Source: The authors.

In order to carry out the tests or tests the student must choose the type registered by the teacher after this will be sent to a screen with the question in the time that will be of multiple choice character, according to the accomplishment of the same it will have commands that will direct to the next question until finalizing and verify their performance. Figure 6 exemplifies how one proceeds in the question screen.

Finally the teacher can consult the test in question and check how many have already done, the number of correct answers, errors and an index of the test, just as each question also has indicators that determine the amount of correctness and errors, based on this it is possible to verify the quality of teaching through the

content administered as well as the level of difficulty of the question elaborated. Figure 7 exemplifies the teacher's vision for examining evidence.



Fig.7: Results of events.

Source: The authors.

### III. CONCLUSION

The teaching of mathematics becomes essential for any professional currently and of great importance in basic education, with this new stimuli and motivations must arise to improve learning and ensure the knowledge of those who study, the tool focused on learning and promote ease in the teaching of mathematics at a fundamental level using android technology obtaining success for being of great use in the current era in mobile phones supplying the need of those who use and for a better didactics in the classroom for teachers and pedagogues as a tool to support teaching.

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