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Design and construction of an educational software that can be used as a teachin resource to improvereading learning in 1st and 2nd grade children

Software educativo como recurso didáctico para el aprendizaje de la lectura en niños de 1° y 2° grado de educación primaria

SANTOS-HERNÁNDEZ, Enriqueta†*, PÉREZ-ESPINOZA, Emma and MARTÍNEZ-HERNÁNDEZ, Mariela Lizeth

Instituto Tecnológico Superior de Tamazunchale, Computer Systems Engineering Division, Mexico.

ID 1st Author: *Enriqueta, Santos-Hernández* / **ORC ID:** 0000-0002-7077-367X

ID 1st Co-author: *Emma, Pérez-Espinoza* / **ORC ID:** 0000-0003-4493-2427

ID 2nd Co-author: *Mariela Lizeth, Martinez-Hernandez* / **ORC ID:** 0000-0002-8635-1930, **Researcher ID Thomson:** H-8093- 2018, **arXiv Author ID:** 2233455, **CVU CONACYT ID:** IT17A492

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Abstract

This research aims to show the results obtained in the elaboration of the design and construction of an educational software that can be used as a teaching resource to improve reading learning in 1st and 2nd grade children of the Ignacio Allende elementary school of the community of La laguna, Pisaflores Hidalgo, in the development of the application was taken as a guide the agile methodology XP since this methodology is focused on small projects and with small time periods for which it was based on 5 phases (idea generation, analysis, design, development and testing or implementation) of which only the first three and 50% of phase 4 were achieved. In order to achieve the results obtained, research was carried out on similar projects that would help to inform the research as well as to know if both students could accept it and teachers qualitative research was used and the data collection tools were the interview and survey, Applied to the students and teachers of the institution. The scope of such research was to generate the design of the application "game with Kika" as well as part of its programming.

Educational software, Methodologies, Reading learning

Resumen

La presente investigación tiene como objetivo mostrar los resultados obtenidos en la elaboración del diseño y construcción de un software educativo que pueda ser utilizado como recurso didáctico para mejorar el aprendizaje de la lectura en niños de 1º y 2º grado de la escuela primaria Ignacio Allende de la comunidad de La laguna, Pisaflores Hidalgo, en el desarrollo de la aplicación se tomó como guía la metodología ágil XP ya que esta metodología está enfocada a proyectos pequeños y con periodos de tiempo reducidos por lo que se basó en 5 fases (generación de la idea, análisis, diseño, desarrollo y pruebas o implementación) de las cuales sólo se lograron las tres primeras y el 50% de la fase 4. Para lograr los resultados obtenidos, se realizó una investigación sobre proyectos similares que ayudaran a fundamentar la investigación así como a conocer si tanto los alumnos podían aceptarla como los profesores se utilizó la investigación cualitativa y las herramientas de recolección de datos fueron la entrevista y la encuesta, aplicadas a los alumnos y profesores de la institución. El alcance de dicha investigación fue generar el diseño de la aplicación "juego con Kika" así como parte de su programación.

Software educativo, Metodologías, Aprendizaje de la lectura

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* Correspondence to Author (E-mail: L17isc015@tamazunchale.tecnm.mx).
† Researcher contributing as first author.

Introduction

At present, the use of technologies has brought great benefits to humanity, thanks to this several aspects have been improved in society and in its different areas; as in health, another area in which tics have brought great benefits is education, thanks to this learning methods have been improved as well as the tools so that both students and teachers can achieve a better acquisition of knowledge.

As Pereiro (2014) expresses, the way of learning is evolving, which is why new teaching methods and tools have emerged. Nowadays students begin by losing interest in the methods of knowledge acquisition, so to help the student not lose interest in reading and allow it to develop in a better way, the proposal is made that, with the use of new technologies, students will improve in this aspect.

Based on the tools that technology provides us today and analyzing the use of software within the field of education was given the task of innovating the teaching and learning of children, based on this achieve a better development in oral and written expression this based on the use of educational software, thanks to this it is possible to have more knowledge, fluency in the pronunciation and intonation of the syllyas, the formulation of the words and the knowledge of them.

In the present research, the topics of reading and writing were addressed, which are a problem that affects many of the educational institutions of basic level, in this case especially focused on the Ignacio Allende institution of the community of La Laguna Pisaflores Hidalgo, which contains a high rate of students who still do not know how to read or write. This research aimed to design and build an educational software as a resource or didactic tool to improve student learning. It is worth mentioning that this application will not be implemented due to the limitations generated by the pandemic that is currently being experienced, but once the situation normalizes, the possibility of its implementation will be analyzed and will be taken as a tool during online classes.

Likewise, it was proposed as a hypothesis that the educational software must contain images, sounds and colors that attract the attention of children and allow them to learn to identify letters, can form words, these in turn allow them to acquire the necessary knowledge so that they learn to form words and approach Reading. In the same way, the general objective was established: To design and build an educational software as a didactic resource to improve the learning of reading in children of 1st and 2nd grade of primary education.

The research allows to base analyzing the methodologies that are used for the elaboration of an educational software depending on the degree of complexity that it has, for example for the elaboration of the design of the software the agile XP methodology was used which is focused on small projects and with a short period of time, Likewise, the stages that constitute this research were carried out, which were generation of the idea, analysis, design, development and tests, it should be noted that the development phase was 50%. Finally, the conceptual framework which allows to know the concepts that are used in the research to be able to understand more the topic that is addressed.

The contribution of this research in terms of the others, is that this research uses the method of learning by syllables which allows a better acquisition of knowledge and in an easy way. This research carried out is important because the problem was identified and based on this it was proposed the development of an application based on the problem found in the children and the way of teaching of the teachers, the application will help the children in the knowledge of the syllyas and in the formulation of the words through them.

Literary magazine

"Didactic programs, when applied to the educational reality, perform the basic functions of the didactic means in general and, in addition, in some cases, according to the form of use determined by the teacher, they can provide specific functionalities." "On the other hand, as with other products of current educational technology, it cannot be said that educational software by itself is good or bad, everything will depend on the use made of it, the way it is used in each specific situation (Chacón, Moreno and Gómez, 2014, pag.31).

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Ultimately, its functionality and the advantages and disadvantages that its use may entail will be the result of the characteristics of the material, its adaptation to the educational context to which it is applied and the way in which the teacher organizes its use. (Chacón, Moreno and Gómez, 2014, pag.31)

As Pereiro (2014) expresses, the way of learning is evolving, which is why new teaching methods and tools have emerged. Nowadays students begin by losing interest in the methods of knowledge acquisition, so to help the student not lose interest in reading and allow it to develop in a better way, the proposal is made that, with the use of new technologies, students will improve in this aspecto.

In this regard, Rodríguez (2014) mentions that today the use of technologies in education is a topic that day by day is taking more highlight, in Ecuador because not all students have knowledge of these technologies and much less have access to one of them, which is why it was decided to implement the use of educational software in schools with the aim of creating tools for teachers and promote student learning, this in turn improves and changes the educational process in a positive way.

As Vega (2014) points out, due to the insufficiencies that affect learning and reading, it is proposed to work with methodologies with a psychopedagogical approach as a dynamic, continuous and developer and forecasting process. So that the student acquires a better learning. For the collection of information and analysis of the problem, different methods were used in the collection of information, in this case through the bibliographic method different sources of information about educational software were investigated and how these can help in the process of literacy in students and in this way based on the research theories were compared and the requirements of the software were formulated. In the implementation of this software as proposed by Chillogallo and Llivigañay: teachers agree that the software developed presents the topics in a clear and simple way, which encourages self-learning in children for its didactic quality, in addition to its simple language in the different interfaces, accelerates the process of adaptation of children when using it, in this way it is demonstrated that the software meets the expectations and educational needs of users. (2015, p.58)

In the opinion of Franco (2015) education becomes increasingly important for societies, since it contributes to social transformation, today the digital era is booming and thanks to ICTs have allowed new learning networks to be generated not only in children but also in young people contributing in a better way to their academic training.

As Gómez (2015) points out, with the passage of time day by day technologies are required or used more, which is why a study was carried out on which are the most used devices and which are those that are used for an educational purpose, so at this point the methodology with which these apps work was analyzed and what is the branch to which it belongs and what type Methodology has either branching or customization. Based on this, he concluded that the use of educational software is a tool that allows to be of great support for both students and teachers in the process of learning to read which so far has had favorable results.

Molano (2015) expresses, the need to improve our percentage in the reading of Mexicans raises this software, which allows a mediation for the improvement and increase of the learning of reading in children and young people, it adopts measures so it follows a study methodology based on evidence that is carried out nationally and internationally. Since the selected methodology allows to develop the competences in reading and writing through a technological development.

Nowadays a technological mediation is a response to the different difficulties that students show in the first school grades due to this, a software aimed at teaching reading and writing favors the autonomous learning of children and increases skills in these areas. A world without reading or writing is a world without dreams and without illusions, Reading and writing are two basic life skills; therefore, building a software based on the Affective Method for Learning - MACPA- that accelerates the processes of acquisition, use and development of reading and writing is an imperative to improve the quality of life of children and young people. (Molano, Quiroga, Romero and Pinilla, 2015, p.1)

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According to Pérez (2015) the use of ICT as a didactic strategy in the classroom facilitates the construction of knowledge acting as a forceful process since images, sounds and words allow greater capture of information in a dynamic way.

Based on the shortcomings of second-grade students in basic education in the area of literature as Quevedo points out, it was decided to resort to the use of ICT: Interactive learning techniques allow students the opportunity to participate with new material as they learn, helps them process information and cement their knowledge. Interactive learning includes activities with the use of new technologies, in which the teacher is a facilitator of knowledge. (2015, p.44) For the development of this software, the different methods of learning to read were analyzed, which were implemented in this tool .According to Bustos, (2016) iterative applications can be of some support for the development of skills in children, so that the child manages to retain, learn and reinforce certain knowledge the teacher must make an accompaniment so that the student formulates his own hypotheses, therefore regarding the use of these softwares serve to enhance basic skills such as reading and can be used in combination with other resources and strategies than teachers establish. According to Bustos and Valverde (2016) to attack the problem of low learning in children, the proposal is made to use an educational software in order to implement the use of ICT and in turn obtain a work tool for teachers. Therefore, the "Educaplay" software is used, with which favorable results are obtained both from the students and from the teachers. This software helped students get better concentration, memory development and improve learning. Citing Caiza and Álava (2016) the way of teaching has become routine, so it is intended to generate innovation processes by teachers in such a way that the use of information and communication technologies is implemented within the classroom.

Developing methodology

The type of research that was used to carry out the research was qualitative because it is required to know the benefits that could cause the use of educational software as a didactic tool for learning to read in children of primary age.

Therefore, the scope is to obtain as a result the analysis and design of the application, which should be attractive for children to show interest in using such software if it is implemented. The design to be followed will be as follows: definition of the problem, design of the work, data collection, analysis of the data, validation and proposal of the design of the software.

This work is important because the place where the research was developed was an educational institution of basic level, where it has traditional methods for teaching such as the paint and marker, however, today with the pandemic that still crosses the country, it becomes more complex so it is very helpful the development of the proposed software. For this it was necessary to go with experts in teaching topics to obtain recommendations and points of view to develop the tool and make it suitable. To achieve the stated objective, it was necessary to go through 5 steps or stages:

Figure 1 Research process
Source: Own elaboration (2020)

Developing

Step 1: Designing and Selecting Instruments. The instruments selected and designed were two:

Interviews: The interview was applied to the teachers and directors of this institution, to know their opinion regarding this project and what is the experience or knowledge they have regarding Ict and what is the opinion of using an educational software as a tool in reading learning and if they would use it**.**

Surveys: This instrument was applied to first and second grade students in order to know the use of technologies and what is the level of acceptance of an educational software, as well as to know what design such software can have so that it is attractive and can be used by them.

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Step 2: Selecting unit of analysis: We considered 20 students who were surveyed so they selected by calculating the sample size for finite populations in the 1st and 2nd groups. For the application of the interviews were selected using the simple random method and two of the teachers who work with these students were taken into account.

Step 3: Implementation of instruments: To carry out the application of the surveys the first thing that was done was to notify the director about the project and that the data collection would be carried out so the principal provided the list of the students who were selected to answer this survey so the survey had to be carried out the survey of the students in their homes. For the application of the interviews, first, the teachers were informed about what the project consisted of and the date on which the interview would be conducted with each of them was planned, once the dates were established, the interview was carried out, so the zoom tool was used.

Step 4: Analysis of the results obtained from the application of the instruments: To carry out this activity, Excel spreadsheets were used and the information collected from the interviews was analyzed, with which it was possible to report the findings obtained, as well as the quantification of the results of the survey.

Step 5: Development of proposal: Once the application of the instruments and the analysis of the information as a proposal to the research was made the proposal of the design of an application which can be applied in that institution to reduce the problem of reading, the content of the application is divided into two parts one is the pronunciation of the syllables and the other includes the formation of words using the syllables of the first section, the development of this application was based on the XP methodology, which has the following stages idea generation, analysis, design, development and testing. From these stages it was possible to conclude until the design stage; the development of the application was done in visual c #.

Product

Product 1: Product of the formula applied for the calculation of the sample.

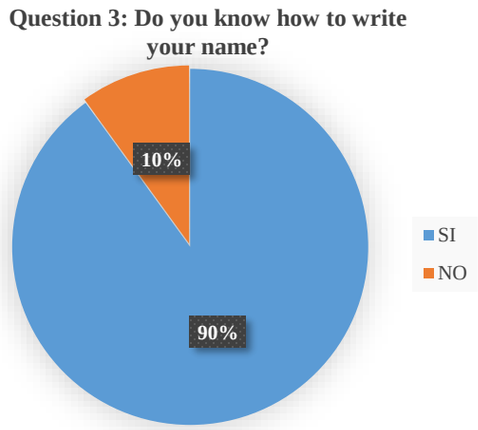
Sample size of the population

Parameter	Insert value		
N	20		Sample size
Z	1.96		"n"=
P	50%		19.05744618
Q	50%		Redobde
e	5%	Sample size	19.06
	19.208		

Table 1 Application of the formula for sample calculation
Source: Own elaboration, (2020)

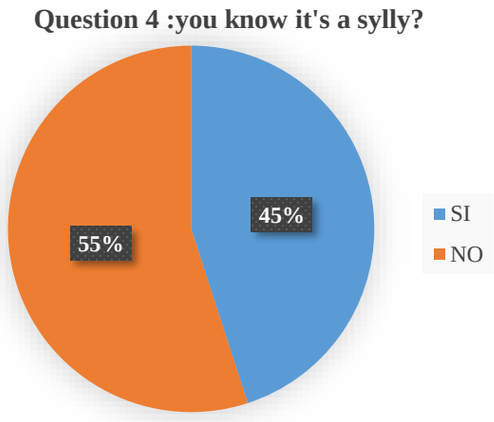
Product 2: Aplication of survey

The analysis of the data obtained was carried out, in relation to the survey the results were the following:



Graphics 1 Impact of the use of educational software
Source: Own elaboration (2020)

In relation to the question, 90% of the students surveyed know how to write their name but cannot read.



Graphic 2 Knowledge of sylly
Source: Own elaboration (2020)

The results of the majority of the students 55% were that they did not identify that it is a sylly, on the other hand, 45% more if they knew, but did not know that this was known.

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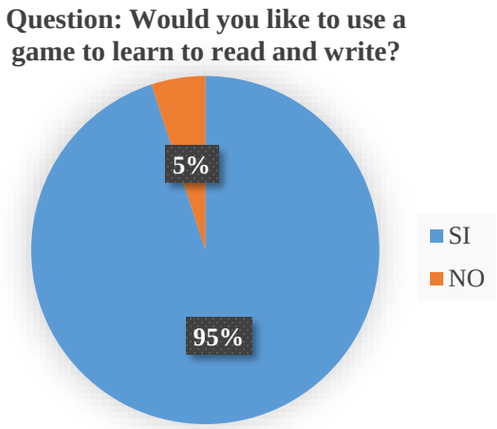

Graphic 3 Using educational software
Source: Own elaboration (2020)

The results for the use of an app are very favorable. Students' responses are based more on learning by using games to make it non-monotonous. 95% of students would like to use an application to learn to read and would be willing to manipulate it.

Most students would like to learn, but in a fun way.

Product 3: Interface of the proposed application

Based on the answers obtained from the instrument that allowed to diagnose the current situation, we proceeded to elaborate the software for primary school students, then the environment and design are shown in a synthesized way:

Figure 2 App home screen layout
Source: Own elaboration (2020)

The image above shows the main access screen to the application.

Figure 3 Main menu interface of the game with Kika application
Source: Own elaboration (2020)

Interface of the main menu is responsible for linking all the forms of the application as well as the pronunciation and those of the divination of the words.

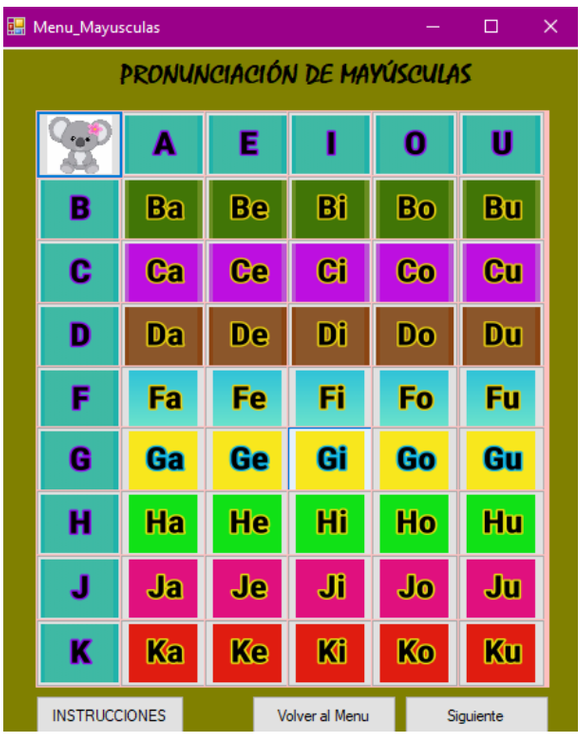

Figure 4 Interface of the pronunciation of capital letters
Source: Own elaboration (2020)

Allows you to select the syllables and listen to their pronunciation as well as the way they are written.

Figure 5 Interface of guessing the words of animals
Source: Own elaboration (2020)

Interface of the form where the user can guess which syllables are missing in each word and can place it to be able to win.

Closing

Most of the students know how to write their names but do not know how to read, in the same way few know that it is a syllable, in relation to the way of teaching of the teachers you can see that they do not use the technologies of the information to favour the learning of the students, in the same way it is concluded that the students have different styles of learning but the one that more predominates is the visual learning, finally, students agree to use an interactive application for their learning from the information obtained in the interviews carried out it was obtained that none of the teachers has worked with an educational software to teach the students, however they have used it for their professional training, in the same way that they do not use a planning for each of the grades, and in the approaches of the activities they do not use activities that favor each of the different learning styles, in relation to the use of an educational software teachers would like to use it in this way would favor them so that students learn to read more easily and would be willing to train themselves to be able to use it in the classroom as a tool in their work.

As for the software developed is user-friendly and visually appealing to basic level students, which will allow it to be interesting for them and it is expected that once it is implemented students will learn through more interactive activities. It is also intended to train teaching staff on the handling, use and installation of software.

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