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Proposal of Technological Resources to Support the Teaching-Learning Process

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Abstract: *The use of technology as in computers, cell phones, Internet, and other means, is currently an obvious essential resource that has acquired a surprising strength in the system of educational teaching at all levels, particularly in basic primary and secondary education, so that every day it becomes more necessary for people to specialize in the application of this technology. As support for the correct use of this modern technology widely used in the classroom is presented the proposal for the development of three educational software with the objective that they serve as sustenance in the exposure of different topics to the learners.*

Keywords: *Technological Resource; ICT; Education; Educational Software*

I. Introduction

Nowadays, the Information and Communication Technologies (ICT) are undergoing a dizzying development, which is affecting practically all fields of our society, and education is no exception. These technologies are increasingly seen as a necessity in the context of society where the rapid changes, the increase of knowledge and the demands for an education of high level constantly updated become a permanent requirement at all levels of education.

At present, the teaching-learning process puts the student as the primary agent with a greater participation in the construction of his learning, the teacher takes then the role of a guide with the main task of providing the most appropriate ways to reach the goal. For this, it is necessary the creation of learning experiences that are attractive to the student, to be able to introduce him into the process that will lead him to acquire curricular competencies. In this sense, it is understood that for professors it is a real challenge to create such environments and make them attractive to the vast majority of their students [1].

It is here where existing technological resources and new technologies have proved without a doubt that they have brought great benefits to education, however, it should also be mentioned that for this to be reflected in success, professors have a big responsibility since they must be in constant updating to renew the teaching methods that they implement with their students; as well as the fact of the necessity of being creative in the design and presentation of the same to the students.

II. Objective

This work describes the proposal for developing three technological resources conceived as educational software, to serve as tools for teachers in their educational labor in the construction of learning experiences with their students, with emphasis on the level of primary and secondary (basic) education, in the themes of the senses, the periodic table and knowing the PC.

III. Educational Software

In general, there is a great variety of definitions for the term "Educational Software", however, most of these definitions present common aspects that must categorize a software to be considered educational: didactic purpose, pedagogical intent, curricular support, pedagogical material and didactic medium [2].

In this sense the following definition is presented: educational software are computer programs made with the purpose of being used as facilitators of the teaching process, and consequently of the learning process too, with particular features such as ease of use, the fact of being interactive and the possibility of personalizing the learning speed of students [3].

Sanchez indicates that the literature defines the generic concept of educational software as any computer program whose functional and structural features serve as support for the process of teaching, learning and managing. A more restricted definition of educational software is the one that defines it as that learning material specially designed to be used in a computer in the processes of teaching and learning [4].

Educational software is usually in the form of applications, which are designed to achieve diverse purposes in the field of education, from databases, to didactic support programs designed to present some thematic content or subject [5].

The book Educational Informatics classifies educational software in different types, and the one that fits to what this article raises is the one known as Tutorial, since it presents information that is reflected in a dialogue between

the apprentice and the computer on one hand, while on the other it uses a cycle of presenting information and answering one or more questions or solving a problem. This is performed so that the presented information motivates and encourages the student to engage in some action related to the information [6].
Currently, educational software offers environments in which students can interact and at the same time acquire knowledge.

IV. Technology Enriched Learning

Information and Communication Technologies have penetrated deep in the areas of human activity, especially in the educational one, which brings a reflection on their use, knowing the factors that favor or prevent their incursion into the classroom, likewise, the participants of the educational process have experienced changes and new requirements, product of globalization and of being immersed in the society of knowledge and information, because of that the teacher must possess a series of educational competences and basic skills in the use of ICT to address adequately the characteristics of learners in increasingly demanding and of quality scenarios [3].
The proper use of ICT in education is crucial to give educators an easier access to the tools necessary to creatively impact in the teaching-learning process, enabling them to overcome the problems and challenges that a disruptive and global environment demands them to successfully advance toward a knowledge-based society. (UNESCO, 2009) [7].
A technology-enriched learning environment makes it possible to offer educators new ways of teaching and reflection over their own educational practice, allowing them to empower the student in the use of such technology to stimulate his learning process [7]
However, technology by itself may not have a positive effect over the learning process if there is not a methodological and theoretical approach that underpins the teaching process [8]. From here derives the importance of a constant and conscious preparation of the teaching staff at all educational levels on to where it is wanted to go and to where it is wanted to guide students.

V. Development proposal of educational software

This section describes the development proposal of three technological resources of the type Educational Software – Tutorial:

- The first one is named *Periodic Table* and is oriented to secondary education (the final phase of basic education), which is the first moment in which the student has contact with this concept.
- The second one is *The Senses*, which is aimed at children of the lower basic education and preschool to help them to identify which are the human senses and through what parts of the human body they are perceived.
- Finally, the software *Knowing the PC*, this is suitable basically for students of secondary level and its main purpose is to introduce them in the learning of the most important parts of a computer.

All three will be developed taking into consideration that it must be not necessary user experience in the use of computers, that is why it was decided to build it in an easy to navigate and intuitive environment in which it is enough to just click on the displayed images to be able to interact.

A. Periodic Table

The periodic table of elements is an arrangement of the chemical elements in table form, ordered by their atomic number, by their configuration of electrons and their chemical properties. This arrangement shows periodic trends, such as elements with similar behavior in the same column [9].
The objective of the software Periodic Table is to serve as support particularly for students of secondary level who are just beginning their preparation in the field of chemistry, what will allow them in an interactive way to identify each one of the elements in that table. This software will display an image of the periodic table of elements and for each one of them will be possible to visualize its basic information such as: Atomic number, symbol, name, atomic mass and the image of some object (living being, plant, mineral, etc.) that contains that element.
Like the periodic tables of the physical world, the software will differentiate (with colors, marks, etc.) if the element is solid, liquid, gaseous or unknown, as well as if the element is a metal, nonmetal or metalloid and to which class belongs within that classification. Figures 1 and 2 show a part of the design of the software Periodic Table.

Figure 1 Design of the software Periodic Table.

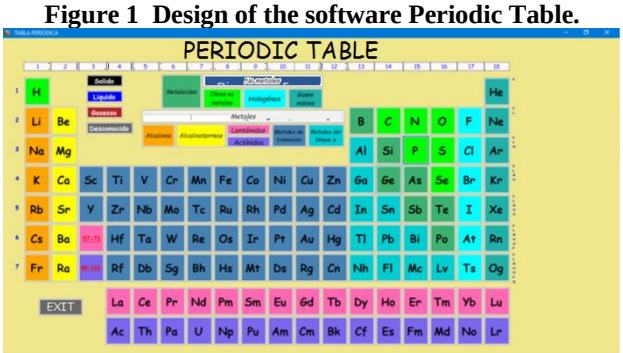
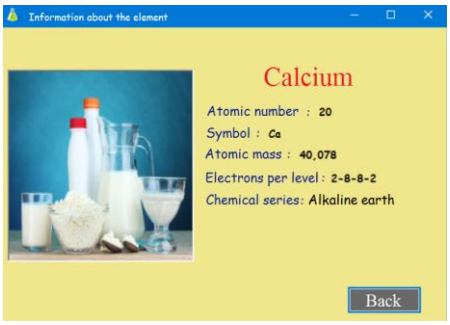


Figure 2 **Information about the Calcium Element of Periodic Table.**



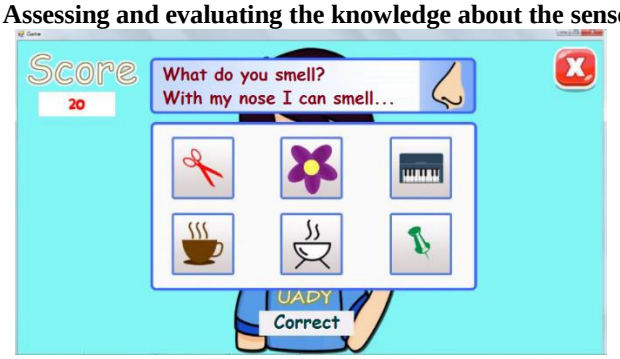
B. The Senses

The body is equipped with a complicated structure of sensory receptors, which keep it connected to the outside world and provide information about the environment that surrounds it. The information collected by sensory receptors is sent to the brain, where different areas process it and, if necessary, give the indication to act accordingly. The stimuli that arrives from the environment are very diverse, but the sensory organs are very specific, and only react if the stimulus reaches a certain level of intensity and duration [10]. The sense organs are responsible for this collection of information and enable people to see, hear, smell, taste and have tactile sensitivity.

This proposed software is oriented to children of preschool and lower basic education, and will allow them to listen a brief information about each sense by touching on an image the part body that represents it.

Additionally, this software will have an option to assess and evaluate the knowledge of the student, in which given an image of a body part representing a sense, the student must select the images that match with the sense; for example, when the image of a nose is displayed as is shown in figure 3, the student must select the images of things that can be smelled, in this case the child should select the flower, the coffee and the soup.

Figure 3 **Assessing and evaluating the knowledge about the sense of smell.**

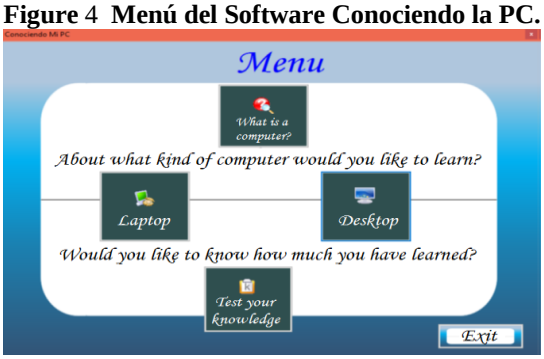


C. Knowing the PC

This proposal consists of a software suitable for students of secondary level, it aims basically for them to know what is a personal computer, its definition and its parts from the user's perspective, for both the desktop and laptop versions.

Likewise, within each section the parts of each of the treated computers are described. The proposal also includes a section to test the acquired knowledge based on the material presented for its study. Figure 4 shows a screen designed for this software Knowing the PC.

Figure 4 **Menú del Software Conociendo la PC.**



VI. Conclusions

With the introduction of new the technologies in the classroom, teachers require to develop not only educational competences, but also digital ones to reinforce and enrich the themes of the taught subjects. Education has been

transformed with the new technologies; however, beyond the assumptions, there is still much to be gained, since the use of technology does not only implies a change in the ways of learning and of teaching, but also requires of other factors such as infrastructure, equipment, pedagogical competences, and openness on the side of educational institutions [11].

Education cannot remain apart from the evolution of ICT, due to two important reasons: this type of means is the basis of the current society – within which the pedagogical sector develops and acts –, and on the other hand, education has been characterized by its use of social communication, that today goes through the use and diffusion of ICT [12]. In this sense, the three software proposed here are intended to be an aid to teachers in the themes of the periodic table, the senses and knowing the PC, during their teaching process towards the students, since teaching experiences with the use of ICT have resulted motivating for students compared with the traditional teaching process. However, before putting them into use, these will go through a stage of testing in the field and their results will be analyzed.

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