

New Practices of Learning Using Adjustable Software

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We can perceive that in our society “ learning“ today is not the same as to just acquire knowledge. We must realise that, in our present society, “learning” is not the same as just acquire knowledge, but it also means to use elementary tools, so that learning can be applied in real life. In this context the teacher has an important role in the definition process of new teaching practices. We have proposed a project that develops a new type of software, which contributes to a more efficient teacher’s performance, inside the classroom. This software generates new mechanisms in order to allow the definition of new practices, according to the teacher wants to teach. This new approach allows students to minimize their difficulties. This software was built using Human Computer Interface and User Interface Design models in order to fulfil the goals we want to reach.

Keywords new practices of learning; adjustable software; TIC; HCI; UID

1.Introduction

One of this project’s, the “New Practices of Learning in Classroom” goals is to develop an interactive software directed towards individualized education, as a way to contribute to a belonging sense in educative success. The software developed for this case has very particular characteristics, leading to an enlarged interaction between the software and its user. One of its particular characteristics is that it can be seen according to 2 different points of view: the student and the teacher. Interaction between software and student has already been studied by us[1] and for other people. But in your case we have studied some methodologies. In this paper we referrer some these methodologies.

In this software development process, teacher took a very active action, allowing him to have, in the present time, a very dynamic role in this process. How can teacher interact with software? How far he in program’s contents and has a qualitative analysis of the student’s performance, without the use of the traditional assessment tests? We think we have the answer to these questions, allowing teacher to insert all the content taught to the class, but according to each student, considering an individualized learning environment. The contents introduction must be easy and intuitive, in order to give the teacher a sense of his domain over the software. In this perspective, teacher is the master and software is the apprentice. Software contents can be changed at any time and insertion of new contents is allowed, according to the student’s progress, increasing or decreasing the difficulty level of the problem placed to the student. Before this fact, we considered [2], because it pays attention to an assessment model which goals are assessment subjects, as showed in figure 1.

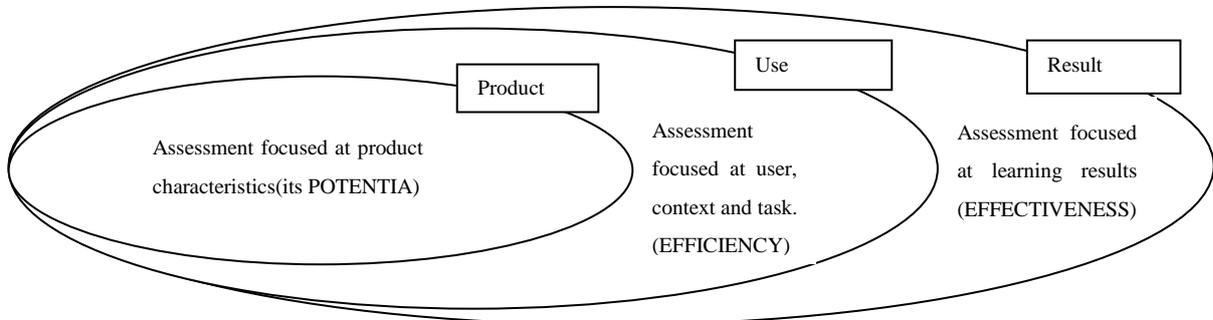


Fig. 1, Assessment goals, Costa [2]

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For Costa [2], and Galvis [3] for Assessment focused at Product Characteristics, “it’s convenient to take a holistic assessment, having as main standard reference the largest context where a particular multimedia product is going to be used“. Thus, teacher is who determines which characteristics product must have, in order to increase its potentialities. This is the point where teacher can insert the program’s contents. “Efficiency” focused assessment allows teacher to assess student’s performance in new situations, while results focused assessment allows teacher to assess student’s progress in his learning process, considering the users cognitive capabilities and the context and situation factors, as referred by [2]. This research work lead to an assessment framework according to image 2.

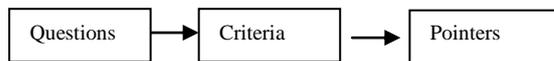


Fig. 2 Structuring elements of Software Assessment, Costa [2]

For [2] the element “Questions”-> “all the questions that allow explaining each component and drawing the line of the respective content, for instance which type of communication is established between the application and the user? How application-user interaction is processed? “Criteria -> “all affirmative formularizations that allow the differentiation in each category to be assessed and that later will allow the production of value judgments” [2], for instance the learning easiness that software must have. Pointers -> “set of evidences that can be observed that supply the necessary information for the criteria operation” [2], the participation level that a particular software requires from the user, in other words, its interactivity.

When using the systemize information about each element [2], reached the required information to formulate a critical opinion sustained on a product under analysis. Thus, this model encloses the final product and was used by us, together with other models, not referenced in this paper.

2. Project description

This software production is the result of a survey previously applied to several educational software products for elementary education, available in the Portuguese market. From this survey’s analysis two particular and important factors stood out: 1st – in the existing software teacher cannot insert contents for a particular student; 2nd – teachers cannot not assess student’s progress, unless using the traditional method (paper tests or essays), and only during a certain period of time. This way, we realized we should produce something new, as described in the following paragraphs.

2.1 First Project Phase

In this 1st phase, when testing the man-machine interaction, we had to identify the necessary information for this interaction, its appropriate forms and its analysis and evaluation methods. In other words, we carried out a requirements analysis, according to the target population of elementary education teachers. In this analysis we had to consider the teachers computer science abilities. When this project started, we considered only the writing learning in the Portuguese language. But considering the present elementary education in Portugal we made an option for a new software directed also towards the English and Spanish languages. The option for the English language is justified because it’s a subject studied in elementary education schools. We made a choice for the Spanish language as well, due to the importance it has in Portuguese second grade education, and probably will have in elementary education in a near future. Foreseeing this situation, we made our option for the Spanish language.

We had to identify and collect all the important data, so that software may interact with the teacher. This way, we collected all the information regarding learning, cognitive and motor necessities from a previously selected class. These necessities are reflected in teacher’s necessities. As a result, in our software teacher feels comfortable because all his actions (insert/modify/delete and query) are explicit, have immediate reply and a logical sequence, there’s an analogy among them and help provided by the owl image (that represents knowledge) is always available, because owl is in permanent interaction with the software user.

2.2 Second Project Phase

How to present educational and interactive software in an appealing way?

After several researches, we decided to follow some of the methodologies and models referred by Rodrigues & Moreno [1], we skin, these methodologies have a ruler very important and contribute for the success in this project. we have the necessity of studying many models, also included in this project, but not referred in this paper, according to this choice and the model defined by us. The action taken by the teacher was very important and extremely dynamic, because only this way he could feel as part of this project and his opinions were considered and accepted. As such, all screens have been drawn and redrawn for several times, until we got screens easy to understand and easy to use.

It's important to enhance that software only presents the structure, the images, the steps to follow to go the different levels or to other games. Is something like a skeleton, without body mass. All its content is inserted by the teacher in a classroom environment, and according to the student that is going to use it, as if it shows in image 3. This image represents level 1 of the game "Constructs Words". In this game, teacher has to insert 4 corresponding images and 4 words, and words are presented in different colors. If teacher has any doubt, owl is in permanent interaction with him, stimulating him, directing him, helping him, and so on.



Fig. 3 Image representing the Game "Words Construction", Level 1, Rodrigues & Grilo (2006)

This game is made of 3 different games, each one including 2 or 3 growing difficulty levels. In this game, all student's answers are saved, no matter how they are wrong or correct. This way teacher can see these answers at any time, during a period of time and has the possibility to watch the student's progress as well. Student's progress can be presented on screen by a table data or in a graphic way, and can be printed by teacher any time (as shown in image 4).



Fig. 4 Image representing student's answers in all games, Rodrigues & Grilo (2006)

This software also gives teacher the possibility to include work exercises according to subject's matters.

2.3 Third Project Phase

This phase was subdivided in 2 steps. The first one is the final software testing by teachers. The second one, that is presently running, is the assessment analysis regarding the learning process. This software is being used by pupils in the first steps of the reading learning process.

3. Conclusion

The use of this software by students in the first steps of the reading learning is a very important asset as this process gives the students an easy approach to written language, in an interactive way through the word discovery and sentence structure. Software allows student to visualize the all word, and throughout images and words associations, a growing memorization for later syllabic division and construction of other words. Teachers using this software will be able systemize contents and supply student's difficulties, because they are able to change words and sentences, according to students necessities. Further than that, the capability of including work exercises, save students results for each student and watch them in a graphic way, is a tool that makes easier the assessment and students learning management.

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References

- [1] Rodrigues, Elsa & Moreno, José "An Approach for Interactive Educational Software in a Classroom Setting", Conference Internacional de TIC,s en la educación 11/2006- Sevilla, Spain
- [2] Costa, Fernando Albuquerque (2000), t www.fpce.ul.pt
- [3] Galvis, A . H. Ingenieria de software educativo. Sntafé de Bogotá. Ediciones Uniandes, 1992