INTERACTIVE SCENARIO DEVELOPMENT


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Abstract: - The paper describes the development of software called interactive scenarios, used to develop the student creativity, imagination, dexterity and computer skills by managing a personal computer in a graphical environment. The proposal is aimed at students in preschool, primary and secondary for use inside and outside the classroom. The technique used as a method of learning is PBL "Project Based Learning".

Key-words: PBL, constructivism, computer, didactic, scenarios, facilitator.

1 Introduction

The development of teaching methods and learning experiences supported by information and communication technologies allows the creation of interactive materials that promote learning environments, making them more versatile and innovative, which can be beneficial for learning [8-12]. The material called "interactive scenarios" is developed considering the PBL teaching technique "project-based learning" [5].

It is based on a learning strategy "learning by doing", Figure 1, shows that knowledge retention is approximately 80% [1]. Learning by doing is based on constructivist principles, where learning is achieved not as a mere Product copy of reality, but considers the cognitive, social and affective human experience, ie, the student builds through a logical inference based on their experience [3]. The interactive software products have opened an untapped niche market in our country and there are few national companies actually working on this field of application [4].

2 Problem Formulation

The objective is to designing an interactive program that aims to develop concentration, capacity for analysis and synthesis, imagination, computer skills and teamwork in students of preschool, primary and secondary, incorporating various elements in the project multimedia, rich in animations.

2.1 Features and General Specifications

The software requirements must be such that it can be installed on a personal computer with minimum requirements in hardware, software and according to the existing basic equipment in public and private schools, including home computers, together with the following general specifications.

- Be fully interactive and operated through a "Mouse".
- Full multimedia support to effectively help to understand specific task instructions and to avoid boredom during scenario development.
The software must also meet the following specifications that enable individuals to develop skills mentioned above:

2.1.1 Concentration
- Focus on figure drawing by displaying a sample image.
- Include a stopwatch to measure the student capacity for abstraction in the development and construction of a figure; this should be done step by step to evaluate its performance and response times.

2.1.2 Capacity for analysis and synthesis
- Establish a pattern of figures design via the construction of various shapes with different degrees of complexity.
- Have a template-free design that allows building new figures considering a maximum number of components; this will boost the capacity for taking decision.

2.1.3 Imagination
- Have a variety of scenarios within a single subject to illustrate various conceptual frameworks and gender in the student an associative memory.
- To have a free design template, which allows the development of new ideas, new figures and new scenarios, that increase the imagination.
- Establish new styles of design and development of figures in relief.

2.1.4 Computer Skills
- Move into the application of hover buttons
- Select, move, close, open, reduce and exchange information in a graphical environment.
- Interface with other design programs to establish new database.

2.1.5 Teamwork
- To have a free design template that allows collaborative work through the teacher in their role as "facilitator" in a PBL scenario [5].
- Establish roles of participation of each member within the PBL scenario: team member, moderator, clerk and tutor.
- Develop a single idea within a group scheme to form, together with other students, a comprehensive project for a new theme and different from those contained in the original software.
- This proposal has been preceded by an ABP interactive software that accompanies the book: VHDL the art of programming digital system, which incorporates the teacher as facilitator and allows students to measure their learning, knowledge retention, as well as experiences in developing exercises and problems in the book [6].

3 Problem Solution
An analysis of the project was carried out to determine compatible software to use with as many computer platforms which inherently includes multimedia elements to enhance the application.

3.1 Design Platform
The software runs on Flash Player platform, compatible with different operating systems, because it is possible to run on a virtual machine, available in most computer systems.

3.1.1 Programming language
ActionScript 1.0 is a tool of object-oriented programming that allows functionality and management of the events the user generates.

3.1.2 Multimedia tools
Flash Professional, a tool that allows the use of bitmaps and the link with multimedia files to create high performance interfaces.

3.2 Design Flow
The proposed solution is characterized by the structure of the flow diagram, Figure 2.

3.2.1 Block Welcome
Block 1: Shows the splash screen, it must be striking because it is our first contact with the user in (Figure 3), when press the button play, the game starts and the execution continues to block 2.

The basic elements that provide interactivity in the program are hover buttons, Figure 4. ActionScript lets you create objects whose functionality can be manipulated to execute procedures defined by the programmer. In this case, configure each button to make jumps in the program taking the user to the following blocks of the application.

3.2.2 Block main screens
Block 2: These are the main screens of the game and what we consider as the learning platform, where the student becomes familiar with the graphical application. All is based on the hover buttons that
take the student to different sections of the program: Topic, Figure, Scenery, (Figure 5).
This section has added multimedia elements and atmosphere of the game through animations programmed in the timeline, specifying its duration through the use of frames. The integration of sound at the interface enhances the user experience, creates a friendly atmosphere and encouraged to continue in the program to complete the selected project.
Files are in MP3 format and loaded to the program libraries to be played automatically (Figure 6).

Figure 2. Main flow diagram.

Figure 3. Welcome Screen.

Figure 4. Hover Buttons code.

Figure 5. Main Screens of interactive scenarios.

Figure 6. Structure of a frame.
Most of the events that the user performs are managed by the programmer. For example the code snippet in Figure 7, generates the board for blocks placement.
After the board generation, the enhance block is done through Hover mouse that lights up the block position, Figure 8.

![Figure 7. Code generation board.](image1)

Another important aspect is the drag of the piece along the screen by the user, with a program code shown in Figure 9.

![Figure 8. Illumination of the basic block code.](image2)

![Figure 9. Drag block code.](image3)

3.2.3 Custom Development Block
Block 3: Selecting the option of the user creativity is linked with a free template, aiming students to conduct their own prototypes, it has two limitations: the number of pieces to use and a stopwatch. These limitations are looking to, among other things, develop concentration and ability to analyze and synthesize, (figure 10).

![Figure 10. Develop concentration.](image4)

4 Conclusion
The development of this work achieves the objectives for which it was designed and explores new niches of opportunity at enterprise level. It allowed to determine that the technical project-based learning teaching-oriented constructivist "learning by doing" is highly efficient and fun learning. The results obtained generated the development of intellectual property in our country; SEP-INDAUTOR PUBLIC REGISTRY 03-2011-051811564800-01.
The evaluation and implementation of this project was conducted in primary and high schools with approximately 100 people as shown Figure 11.
Evaluation yielded the following results, the participant:

- He was confident using the graphic environment with curiosity exploring the working environment and its various interactive displays.
- Develop design strategies different from those designed for the project.
- Develop a capacity for analysis and synthesis based on experience gained in its learning phase.
- Focus for a long time, more of time considered for the development of the activity, nonetheless the material can be classified as an academic product and not for entertainment. However, the development of new figures increases personal interest, including: Applications not considered in the project as mechatronics, robotics and figures of mythological animals and open up the possibility of a new research project.

The current importance in the design of teaching materials prompted the Council of Science and Technology of the Federal District, the Mexico City to promote the development, through innovation contests in this field: Competition 2010 digital educational materials and resources for the City [7].

References: