# Design of Educational Video Game Interfaces for Learning Motivation

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***Abstract*—Interface design has always been a relevant issue in any type of project since it is the layer that mediates between the user and the developed codes. Therefore, the design must be the most adequate one, both functionally and attractively speaking, so new methodologies and tools must be used to increase the efficiency in the development of these activities. In this work, articles related to the development of video games have been analyzed and a way to integrate it into the development of interfaces as a complementary activity has been proposed. From the articles analyzed it has been observed that the use of video games is as effective to develop the proposed concepts as it is motivating to encourage students to think about the lessons as something fun and interesting than something monotonous and repetitive. The results obtained can serve as evidence to include these activities in the human computer interaction course.**

***Keywords*—video-games; students; education; design.**

## I. Introduction

The design of interfaces has always been a very challenging task, due to the multiple factors that the development team has to face [1], the same happens in the case of video games development as the scenarios, gameplay characters and sensations that they want to transmit to the player, which if they are executed well will make more players be attracted to the game and it will be successful. In our case we will have to look for ways to make a good game to reach the student, in order to strengthen the knowledge we are trying to transmit, for which we will have to analyze certain theories, both in video game development and psychological and pedagogical, in addition to addressing the issue of the player's role with respect to the game, because if he perceives it as a school activity, he will get bored and we will not be able to carry out our teaching objective[2].

Under the framework presented to achieve the outlined objective, previously mentioned, it is necessary to make a review of the pedagogical and psychological branches, since they are the ones that will have more impact in the moment that the student interacts with the game, mainly in the development of the characters and the story of the game, this element is very important since in the development of the story it is possible to emphasize different points of view which will incite the curiosity of the student [2,3]. In addition, the game to be developed must comply with the guidelines of the educational curriculum according to the region in which it will be applied [2], from the points mentioned above you will find in this article recommendations about the development of characters, landscapes and in the narrative of the story, the guidelines of the educational curriculum were omitted since this varies by country.

The article is organized as follows. Section II presents the Related Works. Section III presents the definition of Interfaces with their respective characteristics. Section IV presents video games and how they have been influencing the educational environment. Section V presents cases of analysis how the interfaces in videogames have to be developed in a good way. In section VI it is shown the analysis, priorities in front of the interfaces, as well as how good a role it plays. And finally in section VIII are the conclusions.

## II. Theoretical Framework

### A. Interface

Albornoz [1] indicates that interfaces play a fundamental role in making a product competitive or not. This lies mainly in the maneuverability with which a user can correctly perform an action. The user interface is the part of the software that people can see, hear, touch, speak; that is, where they can understand each other. The User Interface has essentially two components: input and output. Input is how a person communicates their needs or desires to the computer.

### B. Videojuego

Video games are an entertainment activity, usually performed by children and adolescents with the necessary equipment for such activity, in which players control the movement of images on a screen [4], [5]. In addition, this is a voluntary and interactive activity, in which one or more players follow

rules that are agreed upon before the start of the game to avoid conflicts; the basis of a video game is the narrative and interaction with the player [2, 6].

The most important thing about video games is that they are self-centered, as opposed to cinema or literature, which are story-centered; in a videogame everything revolves around the player's experience, mostly videogame designers seek to create an engaging framework for the game, so videogames are seen more as simulations [6]. However, this does not mean that the narrative is less important since this depends on the narrative elements that the videogame has; therefore the narrative of a game varies according to the interaction that we want to have with the player, the narrative can be experimental, descriptive, argumentative, etc[6].

### C. Play and Learn

Playing and learning are two different dimensions, but they can be experienced while playing, the player does not intend to learn much on the contrary he or she just wants to be entertained [3], thanks to previous researches like the one developed by Begoña Gros, in which the study was made in adolescents, surveys were made, students were asked if they ever had any learning experience through video games, surprisingly the answer was no since they concentrated on the game itself [3,6].

However, depending on the genre and subject of the video game, students might be able to learn, for example with video games such as Call of Duty, strategy genres such as Age of Empires and games similar to these, if you have previous knowledge you can learn a lot of small details. Therefore the teacher can make use of video games to complement the learning of students [3].

## III. Methodology

What is being done is a collection and analysis of two implications when distinguishing the importance of video games in education and how these have to be done, in order to generate a degree of satisfaction in people and based on the results of each analysis will be a basic implementation of an appropriate curriculum using the tools related to the subject of the article in search of a possible official proposal for a true syllable.

## IV. Analysis

The authors Cabrera, Gonzalez and Gutierrez [7] present an implementation of different devices to improve the quality of teaching students with different abilities, which shows beyond a new technique since it appeals to modernize the ways of imparting knowledge but also to think about those who do not share the same abilities, and to achieve this has created some games for children using platforms already created as the nintendo Wii.

The author of the Mace [8] proposes a simpler position that is to base his activities on board games because he uses his simple concept and easy mechanics to represent it in the form of video games because it does not need something very saturated with information which is an important point in the design of interfaces to keep things simple but without losing their level of efficiency.

The author Carrasco [9] also presents a posture directed to those with different capacities not only implementing software but hardware for students with special abilities.

## V. Implementation

The way in which it could be implemented would be like an extra workshop for the class sessions of primary level or higher because in this period of life normally is where that interest for the video games and that abhorrence towards the school arises, in addition it has to be implemented in a dynamic way to create that motivational environment because by giving it a theoretical perspective it loses completely the purpose.

## VI. Comparison

This section will show some implications about video games as a tool for learning, and each one will be detailed of the way it happened, as well as the final conclusions of each one.

### A. Emotional Stimulation of Video Games: Eeffects on Learning

Marcano [10] projects an evident impact depending on personal and individual aspects based on a person's tastes, but there are factors that make video games attractive. The factors that the author highlights are: The possibility of competition, the challenge, the possibility of interaction, the actions that it allows to do and the emotions that it allows to live.

Also the senses become a very important aspect, and in such a way the virtual environments, that the sounds are very realistic, as a person is going to interact with the environment generate a gratifying emotional sensation.

In this way, video games become a tool of multi cognitive stimulation which will be important for learning, and also generates pleasure which is very important for the person to feel good, also generating a strategic and creative thinking.

As a conclusion, it is shown that the interaction of the person with the sound, the degree of interactivity that can be generated, and the graphic interface are very important elements for the player to feel immersed, enjoy playing the video game and present a high sensory gratification.

In addition, it will encourage increased self-esteem, achievement motivation, the development of management activities, and teamwork. In this way it should be used in education because it presents a great potential for learning that can be developed in different areas.

### B. Emotions with Video Games: Increasing Motivation for Learning

Gonzalez and Blanco [11] show in their work through an experience that video games present a great attraction and generate motivation to generate a connection with the very dynamics that it presents. In such a way that it will show a playful character and that it will entertain, in addition also that it generates stimuli like the visual, auditory, kinesthetic ones.

These stimuli have a great influence on the player's personal development, and can also be a key factor in the development of self-esteem. In another context, the author mentions cognitive psychology where human factors make present an interaction with computers.

The author's work uses a methodology for the creation of interfaces based on Human-Computer Interaction, centered on User-Centered Design. A video game was created based on the emotions that a video game can generate, trying to adapt this in every aspect of the graphic environment.

This experience was carried out with 23 students of the Human Machine Interaction course of the Computer Engineering School of the University of La Laguna. Each student had to write a blog where they indicated their progress, difficulties and how they perceived the video game. Other characteristics were also taken, such as the video game's own record where it included conversations, routes, etc.

The experience in the first instance the playful character, and that it is not an activity to be done seriously was shown notoriously, but this had a certain implication by the difficulty of the own interface, where it had been shown a certain difficulty of adaptation of the students. At the end of the first day it was shown a lack in the communicative part.

On the second day the communication part had already been improved presenting a clear improvement and satisfaction at the time of playing showing a great capacity for them to coordinate and face each challenge. And on the last day, a great adaptation to the interface was already observed and presented by the students.

The tests show that the activity generated a degree of satisfaction and fun when playing, also to a lesser extent but present showed a certain degree of hostility, and there is also a certain degree of frustration.

As a conclusion, it is shown that emotions can influence in a positive or negative way in the person, and video games that influence education will have an implication regarding those emotions. Also the factors of satisfaction become very important so that the players who would be the students are constant at the time of learning.

Also, the emotional form that video games generate, be it mystery, surprise, can greatly influence students to remain constant. And that a playful activity such as video games is a very large source of enjoyment.

## VII. Proposal

After all the process of analysis and comparison, it is necessary to arrive at an applicable option in the Peruvian student context, for which we propose a series of activities to cause such motivation in the students.

## VIII. Development

### A. Game Analysis

A free or simple access game can be chosen for students to describe as much as they feel by observing their interface and describing how they feel about it.

### B. Description of information

The information of an interface can be either very scarce or very abundant and this varies between the types of games such as shooters (Counter Strike, Call of Duty, Halo, etc) and MOBAS (DOTA 2, League of Legends, Heroes of the Storm, etc).

### C. Color psychology

Proper color management can give a completely different ambiance to any image so the management of lighting and tones is useful to give more depth to an interface.

## IX. Results

The above examination has proven that the use of video games in an educational setting is not only motivating for students working with these new techniques but also helps to improve understanding and retention of knowledge of theoretical issues and at the same time helps to generate knowledge of technology management as a tool.

## X. Future Jobs

The most adequate thing that could be done would be to structure the proposal as a true curriculum which could be applied as an experiment from which data could be obtained from a proven field in the context of Peruvian society with the probability of postulating it as a plan that could be integrated into the curriculum by improving and modernizing the way knowledge is imparted in the country.

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