

# Research and Educational Innovation with Video Games

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## **Presentation**

The transformation of our context into the so-called “digital society” has brought technological media into full focus; they have become mediating instruments not only in the workplace but also in communication and recreational activity (Squire, Jenkins, Holland, Miller, O'Driscoll, Tan & Todd, 2003). The presence of these media in the lives of society's youngest members, along with the practices they create for searching, creating and sharing information, have grown significantly.

In this new universe, video games have come on the scene with great force, as we can observe in their exponential growth in the market over the last five years (Benito, 2012). Video games occupy the leisure time of ever-broader audiences (Martí, 2008), not limited to children. We observe new profiles of players, not only according to type of video game, but also according to the time they dedicate to video games and the format used, whether videoconsoles, social networks (Del Moral & Guzmán, 2014), the wii, multiplayer online games, etc. (Bringué, Sádaba, & Sanjurjo, 2013). It is undoubtedly a widespread phenomenon that brings together several generations in the same virtual spaces, something that from an educational perspective cannot leave us indifferent.

On the other hand, video games are starting to be considered for uses other than mere entertainment or recreation, as vehicles that promote implicit learning, given their attractive formula for training different types of cognitive skills (observation, memory, problem solving, etc.); as catalysts for learning processes; and even as learning contexts in themselves (Olson, 2010).

This new reality has in recent decades sparked the interest of educators and researchers, who have asked about the relationship between recreation and education, and how these new technological instruments called video games may reinforce and create opportunities for learning (Bottino, Ferlino, Ott & Tavella, 2007). Although the importance of games for development and learning has been present in Educational Psychology from classic perspectives such as Piaget and Vygotsky, the new recreational scenarios represented by video games constitute a new, innovative field.

In order to appreciate what the presence of video games has meant in its fullest sense, we must ask what distinguishes them from a traditional game. Starting with classic definitions, a game is a free, conscious activity that takes place outside of normal daily life; it is practiced according to certain rules within space-time limits; and it absorbs the player intensely, making him/her participate in a social group that shares the same interest. In the case of video games, players go so far as to organize themselves into communities where they share experiences and tricks, converting the game into a cooperative activity (Del Moral & Fernández, 2013).

While most video games have rules just like traditional games, there are substantial differences, given that players may intervene and influence the consequences and even become emotionally involved. Interactivity and virtuality are its distinctive, defining features. Video games are constituted in virtual game spaces that allow players to explore and manipulate imaginary worlds. During the game, players act within a virtual reality where they may tell and experience stories, or carry out missions in order to reach certain proposed goals (Lacasa, Martínez-Borda & Méndez, 2013). Therefore, playing a video game means taking an active part, solving problems and making decisions in order to keep playing. These elements are what make video games successful and compelling to children, youths and adults alike.

Many researchers (Cortizo, Carrero, Monsalve, Velasco, Díaz & Pérez-Martín, 2011; Gros, 2008; Lacasa, 2011), like those who have contributed to this monograph, agree that a good video game can be a very powerful learning instrument, that they are authentic “learning machines”. This represents a radical shift in research related to video games in recent years; where once they were considered value-less due to excessive violence (Matamala & Codina, 1992), and highly addictive (Tejeiro, 2001), the research has come to emphasize opportunities that these recreational instruments may offer for learning and skill development, redeeming their educational potential for problem solving (Liu, Cheng & Huang, 2011).

This conviction has motivated a proliferation of the so-called *serious games*, video games created with a clear training purpose. These are currently being used in different spheres (businesses, schools, universities, etc.), whether for the development of specific skills, or for activating creative thinking processes, reasoning or problem solving (Michael & Chen, 2005). Some of the articles in this monograph seek to highlight their potentialities and to analyze their impact in increasing creativity and multiple intelligences (Del Moral, Guzmán & Fernández, 2014). Nonetheless, commercial video games, created for recreation and mere

entertainment, have also shown their mediating character by transforming the formal educational context and the different dimensions that define it (Méndez, Lacasa & García-Pernía, 2013; Monjelat, Méndez, & Lacasa, 2012).

For these reasons, it seemed beneficial to organize the present monograph within the *Electronic Journal of Research in Educational Psychology*, entitled *Research and Educational Innovation with Video Games*, in an attempt to highlight the most important conclusions that have been reached from educational experiences with video games -- both commercial versions and serious games -- within school contexts with different purposes.

To begin, from the international sphere, we present research carried out at North Carolina State University (USA) by professors Lamb, Annetta and Vallett, who study the relationship between different constructs (Fluency and Lateral Thinking), the development of creativity and the acquisition of scientific knowledge. This experience involved a group of students (N=559) who participated in a workshop to design a science-based video game. These workshops used the video game as an educational tool to facilitate specific processes of creative thinking. Notable results include how the videogame design activity stimulated cognitive flexibility and forms of thought integrated in action, thus stimulating increased creativity, as shown by measurements taken before and after participation in the workshops. In the discussion and conclusions, the authors of this study explore how, within this particular applied context, the creation and design of video games contribute to the construction of scientific knowledge and how this relates to creativity and underlying constructs.

Next, the experience described by Del Moral, Fernández and Guzmán highlights the features that make video games (serious games in particular) fun, first-rate motivational resources. They analyze each of the multisensorial incentives that video games offer and that endow them with great potential for developing multiple intelligences in primary schoolchildren. However, they stress that a rigorous selection process is required before introducing a video game into the classroom; the activities and/or missions that are put forward must correspond to curriculum content. Similarly, they note that systematic planning is required in order to take advantage of the opportunities that the game offers for activating different skills. They conclude that the serious game *Naraba World* contributed to an overall increase in all intelligences in the primary students who participated in this innovative experience, being particularly significant in logical-mathematical, visuospatial and bodily-kinesthetic intelligences, the first two showing greater increase in girls than in boys.

Researchers Méndez and Lacasa analyze video games as tools for change, from the perspective of activity theory. Based on a case study, from a qualitative, ethnographic approach, they explore the participants' perspective of the transformation that takes place in a secondary school classroom with subjects who have special educational needs, when the commercial video game Sim3 is introduced. In order to analyze these changes, they use the diagrammatic model of AT and the metaphor of *expansive learning*, exploring the tensions that are created in all elements that define the classroom as an activity system, when an object from the entertainment sphere is introduced as a mediator in the teaching-learning process. This study offers an explanatory model for interpreting the tensions that appear when these recreational resources interact with the complex network of relationships in a formal educational context. Conclusions suggest that the video game be considered a cultural object that stimulates new classroom practices that come into contradiction with the usual practices of teachers and students, and it is an element that overcomes the tension thus produced, bringing about a new, innovative system of teaching.

The article from Zhao and Linaza describes the development process and learning achieved through an experience with boys and girls (3rd-, 4th- and 5th-graders), after presenting them with a totally new, commercial video game. The authors verify that these young players manifest their ability to learn though not being led by the specific instruction of adults; they analyze how the children coordinate and cooperate with their peer group in order to master the novel task of handling the video game. Furthermore, they highlight how this activity fosters students' autonomy in learning and their ability to resolve within the group the different conflicts that appear during the game. Also noted is an increase in the children's ability to create meanings from the virtual world described in the game, its characters and its missions. Similarly, the authors affirm that the video game is able to bring about changes in the relationships between players, activating leadership ability, empathy, caring for other players, and so on.

The final experience presented in the monograph, authored by Cejudo and Latorre, explains an improvement in emotional intelligence that was produced in a group of adolescents (17- to 19-year-olds) after participating in a specific program using the video game *Spock*. They observe that both male and female students showed considerable improvement in emotional intelligence (EI), as measured by the *Mayer-Salovey-Caruso Emotional Intelligence Test* (MSCEIT), though the boys showed greater benefit. Their results led them to emphasize

the importance of implementing similar programs during adolescence in order to foster EI capacity.

The five contributions presented here show empirical evidence and results, from different theoretical approaches and methodological perspectives, that claim to indicate the educational usefulness of video games. All of them concur in the need to properly select the video games used in concordance with the objectives intended, and, aware of their disruptive nature, to systematize interventions in order to control their effects (Del Moral & Fernández, 2015). In all cases, the intent is to capitalize on students' engagement (Deater-Deckard, Chang & Evans, 2013), in other words, on videogames' ability to attract players' attention and immerse them in the proposed tasks, and to transform them into learning environments. This monograph, by no means an exhaustive representation of the many innovative experiences that seek to capitalize on the educational potential of video games, is intended to promote further research in this field.

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