E-GAMES LITERACY: ENHANCING LEARNING AND EXPERIENCE IN PRE-SCHOOL AGES

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Abstract

Digital technologies have created a new environment for education. Especially in the field of Pre-school Education, digital technologies and more specifically video games, is a subject of interest regarding the potential role of computer and video games to support young people’s learning. The aim of this paper is to explore how can the use of mainstream games, both in formal educational contexts as well as outside, can support the learning processes of the children in Pre-School ages.

Keywords: E-games, Literacy, enhancing learning

1 INTRODUCTION

Young people and children are today amongst the biggest user groups of online and mobile technologies in Europe. Thousands of young people across the world engaged in complex multimodal information-handling tasks that modern e-games represent. To date, the majority of the research use of e-games, has focused on informal, out-of-school contexts – on what is being learned outside of the school gates (Sandford and Williamson, 2005) In addition most of the research has been focused on the negative aspects of the video games upon children. As Sandford and Williamson (2005:4) point “studies in this area also tend to concentrate on mainstream computer and video games available from high street stores and their potential application to the field of learning, rather than on professional and vocational simulations or on specifically educational titles.” For Squire(2006:20) “a generation of youth has grown up with games. Yet we know very little about what they are learning when playing these games.” As a consequence, it is crucial to build up better knowledge and understanding of how e-games work and influence children.

An electronic game (e-game) is a game that employs electronics to create an interactive system with which one or more players can play (Wikipedia 2011). The most usual type of electronic game is the video game in which a display device is used for interaction with players. Video games are discerned to computer video games, console games and arcade games. Nowadays, arcade games are not frequently used. There are also some other types of electronic games which are non-exclusively-visual products such as handheld electronic games and specifically non-visual products (e.g. audio games). E-games, according to Jull (2004:30), are “rule-based system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome…. are played using computer power, where the computer upholds the rules of the game and the game is played using a video display”
E-games can be discerned to various categories based on different criteria. Such criteria may be the following:

- The number of involved participants. One may discern games to individualized or team-based games. Obviously such teams may involve two or more persons.
- The device (or media) employed. Such devices are the different types of computers, game consoles (e.g., play stations), mobile (or cell) phones.
- Whether network-based activity is involved or not. Several games may take place in a “standalone” fashion whereas other ones involve network-based (e.g., Internet-based) activities.
- The subject (field/domain) of the game. According to (Prensky 2007) eight (overlapping) categories of games may be discerned: (i) action games, (ii) adventure games, (iii) fighting games, (iv) puzzle games, (v) role-based games, (vi) simulation games, (vii) sports games, (viii) strategy games.
- The age of the participants. Games may be specifically addressed to children of early childhood, elementary school, (junior) high school, adults. Obviously there are also games addressed to all ages. For instance, parents find pleasure in playing with their children.

Computer games, as Catherine Beavis argues, “represent new cultural forms with which young people are increasingly familiar and fluent...educational systems should not remain fixated on transferring to the young the traditional elitist vision of culture and society that they have sustained for decades”. E-games constitute a class of immersive experiential media that are informing and are informed by social space, and as such can be used in order to promote educational aims in pre-school education. According to Squire(2006:19) “game experiences are changing a generation’s attitudes toward work and learning”. Games used for purposes other than entertainment, were estimated in 2005 to be a $75 million annual industry, with a prospect to reach $1 billion by the end of the decade (Erwin, 2005).

Our goal is through a reflexive engagement to provide a consistent framework in which e-games can be considered as means that can support the learning processes of the children in Pre-School ages.

This paper is organized as follows. Section 2 presents the methodology of our approach, while section 3, explores how can the use of mainstream games, can support the learning processes of the children in pre-school education, as well as the need to promote an e-games literacy in order to respond to challenges and opportunities. Finally Section 4 concludes.

2 METHODOLOGY

Through our proposal we aim to examine e-games literacy as a fundamental competence for enhancing learning and experience of children, and for the safer use of the Internet and other communication technologies from children. As Woolsey (2005) argues the “term literacy has been extended to cover the skills and competencies involved in finding, selecting, analyzing, evaluating and storing information, in its treatment and its use, independently of the codes or techniques involved”. In our approach we consider “e-games literacy” as the ability and opportunity to access and use video games as well as the acquisition of knowledge about their functioning and critical evaluation of their content. For our approach we adopt active audience theory because it describes both the effects that e-games have in children and the way we can promote a literacy regarding their uses. According to Active audience theory the audience is neither passive nor homogenous, while in the interpretation of the meaning various factors intervene such as age, social class, etc. This is the case in decoding e-games uses, influences and effects because their study requires an understanding of the full range of human practices through which players actively inhabit those worlds of rules and texts and render them meaningful.

In our paper the following hypotheses will be examined
- E-games can be used as primary tools to promote and encourage collaborative interactive learning.
- E-games literacy can significantly contribute towards achieving educational goals.
- E-games literacy can become a tool in order to empower and protect children and young people online from harmful content and conduct.

Through our research we aim to present ways that can support children’s ‘multi-literacy’ development. E-games literacy must respond to these new challenges in the Information Society environment, which require new creative and critical approaches and which highlight the need for media appropriation by the educational system.

2.1 E-games and Learning

E-games belong to a newer knowledge-management approach labelled as structured sharing (Thiagarajan, 1998). As Jasinski (2006) states “e-games are primarily containers for facilitating dialogue about different problems and issues and for encouraging the construction and sharing of new knowledge, understanding, perspectives, and insights. E-games engage participants and their diverse experiences and competencies, in interactive discussion while they encourage the construction and sharing of new perspectives. Different game templates are designed to facilitate different types of learning outcomes as classified by Gagne (1985). According to Thiagarajan (1996) all e-game templates include the four critical attributes of a game, conflict (which prevents the easy achievement of a specific goal), control (rules for taking turns and scoring points), closure (special rules that specify how the game ends and who wins) and contrivance (an element of playfulness). Exploration, interdisciplinary activities, multimedia (focus attention), interactivity are elements that characterize the positive aspects of the relation build between children and e-games. It is upon these critical attributes that educational environments can build in order to promote their goals and by the same time promote critical competencies for their use by children today and as adults latter.

In the following, we outline certain popular video games for early childhood. Most of them are (or can be) used for educational purposes. More specifically, they usually provide learning activities in an environment that encompasses real-world settings. For instance, e-game activities involving thermometers or purchase of products encompass math, science and language skills. In such settings, young children learn by dealing with real-world problems/situations and construct new or apply existing knowledge. Several of these games also concern exploration.

Popular video games for early childhood are the following:

- **Jumpstart Kindergarten.** It includes 16 games and puzzles for early math, language, and creative arts.
- **Reader Rabbit Personalized Kindergarten.** It involves activities concerning reading, arithmetic and problem solving.
- **Reader Rabbit Personalized Math 4-6 Deluxe.** Children explore basic number concepts in a series of imaginative games.
- **JumpStart Animal Adventures.** Several activities are included providing face-to-face experiences with roughly forty wild animals in their exotic environments.
- **Math Missions with Card Game Kindergarten-2nd Grade.** It covers the full range of early math concepts through a learning journey of discoveries and rewards in a fun, urban environment setting.
- **Math Blaster.** It involves action games with eight levels for basic math skills (i.e. addition, subtraction, multiplication, and division).
- **Jumpstart Advanced Kindergarten V3.0.** It involves action games regarding reading, math and art.
- **The Land before Time Preschool Adventure.** It involves fun interactive learning games concerning alphabet, shapes, colors, patterns, and number recognition.
- **Disney Learning Kindergarten Bundle.** Disney cartoon characters introduce fundamental learning skills, lead to development of critical thinking skills and problem-solving abilities.
- **TLC Reader Rabbit Reading Learning System.** It enhances reading and writing skills.
- **Hooked on Spanish Box Set, Ages 4-6.** It provides basic Spanish vocabulary, useful expressions and phrases.
• *Kindergarten*. It concerns positive reinforcement through audio encouragement, reward animations and a variety of games.

• *Millie & Bailey Preschool*. This game concerns math and science skills including exploring, experimenting as well as “question and answer” activities.

• *Kindergarten*. It concerns a game of kindergarten ownership, money earnings and decisions regarding earning management and upgrading/expansion of kindergarten.

• *TLC Dr. Seuss Preschool Learning System*. It includes fun activities concerning songs, letters, sounds, colors and shapes.

E-games offer potential benefits to the learning process in early childhood. Benefits offered in general by technology as summarized in (Roblyer and Doering 2009) concern the following: (a) additional learning motives provided to children, (b) unique learning facilities, (c) support of new (or promising) didactic/learning approaches, (d) literacy useful to members of the Information Society. In the following, we specifically outline certain general advantages of e-games.

A potential benefit of several e-games offered to children involves their interdisciplinary activities. In previous decades, most of technological applications provided to children concerned a single discipline according to the prevailing approach in school curriculum. However, nowadays-interdisciplinary learning activities are considered more beneficial and are offered in the scope of curriculums (Roblyer and Doering 2009). Most educational technology resources provide (or are used in the scope of) interdisciplinary activities. In the case of early childhood, e-games may combine disciplines such as math, language, arts and science. Such examples were discussed in several of the aforementioned e-games.

Exploration is another benefit provided by certain e-games. Researchers have argued about the learning profits of students in case they interact in an open environment providing the ability or opportunity to explore and discover new knowledge. In such environments, children may construct their knowledge by simultaneously acquiring skills in different levels.

E-games due to their highly interactive features provide the opportunity to grasp and retain the attention of children (Roblyer and Doering 2009). Therefore, with carefully designed games, certain learning goals may be easier achieved compared to other learning approaches. Such an aspect is of interest in case of difficult learning goals that require attention from the children’s part.

E-games also provide multimedia representations to problems and problem solution steps. The visual and audio representations to information lead to its thorough analysis, organization and interlinking facilitating the acquisition and retention of knowledge.

Several learning tasks are performed collaboratively in educational settings. Collaboration takes place in learning environments within different perspectives. At schools, several products (i.e. documents, webpages, wikis and multimedia resources) are the result of collaboration among students. Debates provide also the means for collaboration. Collaborative learning is also useful in problem solving as solutions to several problems combine various approaches. With such activities, social interaction among students is encouraged. Certain (multiplayer) e-games can be designed to incorporate the aspect of collaborative learning.

E-games provide a powerful learning environment, “can improve the teaching of eye-hand coordination and visual spatial ability, help in fostering creativity, encourage exploratory and non-linear thinking, make children feel comfortable with computers and technology in general, and develop literacy, logical thinking, problem-solving, communication, and collaborative skills” (Gordana Dodig-Crnkovic and Thomas Larsson, 2005:22) E-games, as Aarseth argues, are hardly static, in contrast they are ergodic texts, requiring non-trivial effort to explore. Participants learn through a grammar of doing and being. E-games according to Squire (2006) are designed experiences, where it is the players themselves, as Sadford and Williamson(2005) argue “rather than games designers, who are seen as controlling and determining the experience to explore a range of different outcomes”.
Formal educational environments are very different to the informal contexts in which games are usually played, and bring with them many constraints that make introducing games as learning tools more of a challenge than might be thought. (Sandford and Williamson 2005:26). E-games according to Squire (2006) are designed experiences, where the players themselves, as Sadford and Williamson (2005) argue “rather than games designers, are seen as controlling and determining the experience to explore a range of different outcomes”

Habgood’s research reports that e-games allowed children with poor literacy skills to begin creating rich and complex playable environments. In this case as this research shows, children are actually supported in order to combine and productively used knowledge.

E-games engage childrens, to such a degree in order to beat the game, that they are activated to learn, searching for solutions, both within and outside the game. (Gordana Dodig-Crnkovic and Thomas Larsson, 2005).

Considering the interactive nature of videogames, and their polysemic content an important attribute of these media, we should also take into account that they involve participatory interactions among the users and interactive exchanges. This is due to the fact that e-games are as James Paul Gee describes, “multimodal texts” whose features include the constant interplay of visual, aural, textual, gestural and bodily modes. E-games prepare players to deal with complex electronic environments, to negotiate and handle data in multiple formats simultaneously, to interact with images, sounds and actions, and to interact with others through electronic channels (Sandford and Williamson 2005:26). These are key factors in learning as social learning theory suggests, and it can be powerful enough to even affect the players’ actions in the real world outside the e-games (Bandura,1997). Games are and can become a space of playing with rules and their boundaries. Contrast to a widespread belief, the ultimate key to success lies in deciphering the rules, rather that manipulating joysticks (Johnson, 2005). Children playing games are learning how to deal efficiently with dynamic information sources in multiple modes and media. “Interactivity” is the key word, where both children are in a dynamic relation with the digital environment. These games challenge and support players to approach explore and overcome increasingly complex problems while they offer the capacity for players to try out alternative courses of action in specific contexts.

3. E-GAMES LITERACY

E-games are very particular kinds of experiences, and as a result we have to take into account considerations regarding issues such as possible aggressive behavior, etc. As Karadimitriou and Rousou (2011:2) argue “the deep sense of engagement common in interactive game-based learning activities provides the motivation” for a critical examination regarding their role and the literacy needed to be developed in order to promote learning and enhance experience of the children. As e-games use becomes more intense as a medium, “the question becomes not whether they will be used for learning but for whom and in what contexts” (Squire 2006:27)

E-games and in general new technologies are powerful new mediums with important implications for schooling, especially when they are introduced through a literate approach. E-games literacy refers to the promotion of a continuous critical engagement of the children with e-games. The critical areas to consider when developing a e-game literacy approach are firstly the interaction between the player and the games and “the role of games and play in the lives of the players, and how the spaces of games intersect with the spaces of daily life” (Consalvo 2005:9). Studies has shown “that exposure to violence in e-games is significantly linked to increases in aggressive behaviour, cardio-vascular arousal, aggressive cognition, and aggressive affect. A summary of the research findings from both experimental and cross-sectional correlational studies strongly suggests that the potentially harmful effects of violent video games must be taken seriously” (in Gordana Dodig-Crnkovic and Thomas Larsson 2005:24)

An important aspect regarding e-games literacy concerns the time young children spend in e-games activities. There should always be a time limit concerning e-games activities for health
and social reasons. According to recommendations (i.e. American Academy of Pediatrics), in a daily basis children under the age of eight should spend at most ten to twenty minutes in front of computer screens. According to further such recommendations, in a daily basis children should spend at most one to two hours in front of any type of screen. The time children spend in e-games affects the time available for other activities. The more time children spend in e-games, the less time will be available for other activities. Parents are very concerned due to the fact that children acquire most knowledge from virtual and not real-world activities. Young children learn many things through social interaction. As the available time of young children for social interaction decreases, not only do young children not acquire the corresponding knowledge but also social behavior problems may ensue. Games should not replace child-to-child and child-to-parents relationships. E-games should also not contain stereotypes involving gender or nationality. Both genders should be represented in e-games using corresponding character images and names. For instance, a game involving only boy characters or names is oriented to boys. Stereotypes concerning occupation of men and women are another possible negative aspect of games. A point to consider is, that there is little point in introducing a commercial game as a learning tool where other established tools can perform the same task adequately.

4. CONCLUSIONS
As has been shown in our paper e-games pose new and interesting questions both in terms of their uses and effects. They can be a “research and development lab” for educational theory and practice and as primary tools to promote and encourage collaborative interactive learning, while having a significantly contribute towards achieving educational goals. The different ways that contemporary games functions in relation to traditional “educational” games and especially the fact that players are going inside game systems (Squire, 2005) posses new challenges that need to be addressed through the development of e-games literacy. E-games literacy though should be a primary interest since it can become a tool in order to empower and protect children and young people online from harmful content and conduct. E games literacy is about building next-generation learning environments and such further research is needed in order to explore the way that can support learning and education in pre-school ages. E-games can be used as primary tools to promote and encourage collaborative interactive learning, and such can be integrated and exploited in pre-school education, as Gee argues it is pedagogy that needs to adapt to practices that young people in general are bringing into the classroom. The widespread use of e-games results in conceptual and educational dilemmas that must be examined and understood. Further research on these issues will certainly needed in order to respond to the challenges posed and the opportunities created by these e-technologies.

REFERENCES


