The Case of Literacy Motivation:

Playful 3D Immersive Learning Environments and Problem-Focused Education for Blended Digital Storytelling

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ABSTRACT

The University of Patras' Library Services designed and offered to primary and secondary schools the pilot educational program "From the Ancient to the Modern Tablets", featuring immersive multimedia learning experiences about the book history. The pilot program consisted of three stages: a playful library tour, followed by an interactive game-based digital storytelling activity with game elements, and a collaborative creative reflective hands-on activity. Utilizing the avatar psychology power, the visualization and simulation affordances of 3D immersive learning environments and the appeal of storytelling and game-based learning, the "gamified" blended narrative on the book evolution enabled learning as problem-focused, embedded and context-generated. An additional research study was conducted to investigate teachers opinions regarding the effectiveness of the 3D Virtual Immersive Environment(s); this focused on students' learning and thinking skills in the socio-cognitive, psychomotor and affective domain. This work exposes the pedagogical design, presents the socio-technical development and reflects on the initial research findings.

KEYWORDS

3D Virtual Immersive Learning Environments (3D VLE), Digital Storytelling, Gamification, Library, Multi-User Virtual Environments (MUVEs), Problem-Focused Education (PFE), Second Life

1. INTRODUCTION

At times libraries have been criticized for becoming increasingly outdated or irrelevant in the age of ubiquitous access to knowledge and information. We argue that in the era of lifelong learning, libraries can become places and spaces, which host learning opportunities that are accessible to all. Beyond fulfilling their traditional role of offering information and knowledge, libraries can be transformed and evolve to critical and reflective knowledge providers, can offer creative workshops and develop innovative, open learning spaces for any age. Universal access can be achieved with the help of educational technology specialists and learning innovators design thinking.

As an integral part of its mission the Library and Information Center (LIC) of the University of Patras considers that to stay accessible to and collaborate with schools so as to support school teachers and students in their learning ventures. This approach is aligned with the function of Libraries in the 21st century as "third places" (Montgomery & Miller, 2011) that facilitate learning in multiple ways. "A third place is an open accessible area or space where citizens can congregate voluntarily

and interact to produce social value." (Oldenburg, 1999). The two other places where people spent their time daily are workplace and home.

In 2012, the University of Patras decided to launch a new institution-wide initiative called "Schools go to the University", (University of Patras, 2014), and invited all interested departments to design and offer short educational programmes suitable for primary and secondary education schools. All programmes were communicated to schools of the Prefecture of Achaia. Interested schools could arrange visits for one or several class to any programs during a specified spring open-door two-week period.

Responding to this invitation, LIC designed the pilot educational project "From the Ancient to the Modern Tablets", (University of Patras Library Services, 2014), an immersive playful multimedia learning experience about the history and future of books. The programme combines digital storytelling, 3d virtual immersive learning environments, and gamification, utilising the concepts of problem-focused education.

The current work is an extended version of the work presented in a conference publication forum, co-authored by Mystakidis, Lambropoulos, Fardoun, and Alghazzawi (2014). The extended work elaborates more on the pedagogical design, the socio-technical development principles and the formative assessment results of the educational programme.

2. THEORETICAL BACKGROUND

In this section, there is an exposure of our main theoretical terms and pedagogical design concepts. Thus sections 2.1-2.4 outline the conceptual essence and personal motivation to aim at constructing this type of pedagogical instrument that mainly targets at historical events' finding and understanding. The whole research study has been carried out in an experimental, rather unusual, but yet innovative and effective way, which revealed interesting conceptual pedagogical aspects of problem-focused education and enquiry-based learning.

2.1. Digital Storytelling

Storytelling is a universal and diachronic medium for knowledge and wisdom transfer across cultures (Bruner, 1991). Storytelling is the socio-cultural activity of sharing stories, often with improvisation, theatrics, or changing the emphasis on different aspects. Historically, various stories and plots have been shared by humans as a means of entertainment, education, cultural preservation and instilling values and cultural norms. Crucial elements of storytelling are the plot, the characters and the narrative points of view. The term 'storytelling', however, has rather been used in a narrow sense to refer specifically to oral storytelling and also in a looser sense to consider techniques used in other media to unfold or disclose the narrative of a story (Wikipedia, 2017). Further digital storytelling uses contemporary technologies, such as digital media to utilize the ancient form of communication through stories. Moreover, digital storytelling utilizes visual and auditory elements to compose and deliver valuable meanings and messages. Music and sound effects can accompany the narrative to add atmospheric tension to the experience. This type of storytelling is a rather compelling method to construct and organize learning both for children and adults (Ohler, 2006). It can be used both as a teaching and learning strategy, for example as a vital component in an organized student (individual or group) project. Van Eck argues that narration and storytelling are two of the most powerful instructional strategies (Van Eck, 2007). "Stories allow us to learn from the experience(s) of others without having to face another person's personal consequences…" (Baer, 2013). McAdams has argued that the human behavior is being guided by narrative construction (McAdams, 2006). Storytelling has also been found to be an effective method to increase information retention. Adval and Wyer (1998) have demonstrated that adults tend to remember facts and other pieces of knowledge more accurately if they encounter them in a story rather than reading them in a list or simple text format (Adaval & Wyer, Robert S., 1998).

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