Game-like language learning in 3-D virtual environments

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ARTICLE INFO

ABSTRACT

This paper presents our recent experiences with the design of game-like applications in 3-D virtual environments as well as its impact on student motivation and learning. Therefore our paper starts with a brief analysis of the motivational aspects of videogames and virtual worlds (VWs). We then go on to explore the possible benefits of both in the area of foreign language learning. For our research study we have designed a VW-platform, called VirtUAM. This permits us to store and record data related to users' behaviour within the VW. Furthermore the platform has been employed to build several islands (virtual spaces), which implement different game levels. The virtual spaces themselves are used to give students a basic training in different language skills related to the German language. In order to obtain data regarding the game's impact on student learning and motivation, we designed several tests, which were completed both before and after the student participants played the game. Additionally we gave them a general questionnaire, which was only filled out after the game and which aimed at getting personal feedback from the learners. Quantitative and qualitative results shown in this work are part of a larger project which intends to study the impact of game-like applications within virtual environments and with regard to teaching and learning processes in general.

1. Introduction

In recent years many educational institutions have based their teaching on blended learning, which combines face-to-face teaching with an unusually high percentage of autonomous learning and online tutoring. Since then not only students, but also teachers have been facing new challenges. While students are increasingly expected to gravitate towards autonomous learning, teachers have to adopt the role of instructor and guide. This means firstly, that teachers need to explore new ways to ensure that the competences students are expected to have at the end of the term are acquired. And secondly, to make sure that learners receive the necessary guidance to succeed in their learning (Garrison & Kanuka, 2004). One of the main trends in recent years has been the exploration and integration of Information Communication Technologies (ICTs) in autonomous learning, considered to be complementary to face-to-face learning. While face-to-face teaching refers to the general learning process which takes place in the classroom, online learning refers here to autonomous learning through Virtual Learning Environments (VLEs), that usually are supported by Learning Management Systems (LMSs). An LMS is a software application that facilitates the administration and tracking of online events and e-learning programs. It allows to manage documentation, tracking, and reporting of training programs and contents.

The most commonly platforms used by teachers and instructors are Moodle,[1] Sakai,[2] Claroline[3] or WebCT/BlackBoard.[4] The reason for this is the huge number of options as well as facilities they usually offer in terms of the design and use of educational contents. However, following our own teaching experience, as well as the results of several research studies, the above mentioned LMS are not always the most interesting learning tools from the students' point of view. Instead of this, those platforms are often considered as "an unimaginatory repository for teaching materials" (MacLaren, 2004), lacking real time feedback as well as opportunities for meaningful and versatile interaction (Moore & Kearsley, 1996; Sun, Tsai, Finger, Chen, & Yeh, 2008).

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[1] http://moodle.org.
[2] http://sakaiproject.org/.
[3] http://www.claroline.net/.
[4] http://www.blackboard.com.

From the students' point of view, the most interesting platforms seem to be VWs (such as Second Life or Active World), videogames and Social Network Sites (SNSs) such as Facebook or Twitter (Boyd & Ellison, 2007). However, although SNSs are among the students' most popular platforms, various researchers underline that students consider SNSs a "social glue" (Madge, Meek, Wellens, & Hooley, 2009) rather than a formal teaching tool (Lipka, 2007; Selwyn & Grant, 2009). Despite the fact that the findings on the educational potentials of popular SNSs are still limited, many researchers express caution about invading a social networking space that students feel clearly is theirs in order to utilize this space for teaching purposes (Baran, 2010; Madge et al., 2009; Selwyn & Grant, 2009; Usluel & Mazman, 2009).

In recent years there have been several attempts to design specific SNSs to be used mainly in the area of education. Some examples are GoingOn[5] or Edmodo,[6] which both have been created in 2008 to enhance learning communities and to foster collaborative learning processes. In these SNSs, students and faculties are connected to create aggregate contents by collaborating with each other. Although the idea behind the aformentioned SNSs is very interesting, they do not provide as we will see further on neither the same immersive 3D environments nor the same possibilities for interaction as for instance VWs do.

Bearing in mind the aforementioned aspect, we started exploring the possibilities of integrating VWs and videogames in our blended teaching. The reason is that we believe that VWs, together with videogames, represent very stimulating learning environments, as they increase significantly student's motivation as well as learning (Amory, 2010; Blanco, Torrente, Moreno-Ger, & Fernández-Manjón, 2009; Chang & Chou, 2008; Dondlinger, 2007; Garris, Ahlers, & Driskell, 2002; Lepper & Cordova, 1992; Mitchell & Savill-Smith, 2004; Torrente, Moreno-Ger, Fernandez-Manjon, & Del Blanco, 2009).

Before we continue analysing the benefits of combining VWs with game-like applications, it is worth explaining briefly what we mean by VWs. VWs are 3-D environments where users' graphical representations, called avatars can interact with other avatars as well as objects within the environment. Additionally, users are allowed to create new objects. What particularly makes VWs highly attractive for many users is its similarity to the real world's appearance, coupled with its varied possibilities of interaction.

Interaction is here seen as a multidirectional process in which students cooperate with instructors as well as other learners in real time activities, getting furthermore the opportunity to perform tasks in a collaborative way. The fact that a huge number of real life activities can be reproduced or simulated makes VWs a highly immersive environment (Helmer, 2007; Melchor Couto, 2010; Molka-Danielsen, 2009).

While VWs have already been recognised by many educational institutions (universities, highschools, language academies, etc.) for having great potential for teaching and learning purposes (Consortium, 2007; Nardi, Ly, & Harris, 2007), the same does not apply to the videogame genre. Although many researchers have underlined the educational potential of videogames (Aldrich, 2009; Gee, 2007, 2008; Lepper & Cordova, 1992; Malone, 1981a, 1981b; Prensky, 2008, 2009; Rieber, 1996) there are still others who are quite sceptical and reluctant to consider them useful learning tools (Hays, 2005). Instead of this, they often consider them to be *childish and disruptive activities to schooling* (Meyer, 2009).

Nevertheless, the number of teenagers and adults who play videogames is increasing every day. From our perspective, this can be explained by the fact that videogames provide several features which make them attractive to a wide range of people (Garris et al., 2002; Gee, 2007; Prensky, 2009).

Among these, we can briefly outline the following:

- They are highly immersive because objects and environments are created in 3-D.
- They stimulate cooperation and competition by focussing on the achievement of goals.
- They provide players with real-time feedback on their failure or success.
- They encourage attitudes like exploration, experimentation and risk taking in problem solving.
- They are fun and highly entertaining because both are task-based oriented.
- They support different levels of difficulty depending on the player's experience.

However, the above mentioned features are not only the main components of VWs and videogames, but they also support some of the key-principles of foreign language teaching, established in recent years by many researchers (Deutschmann, Panichi, & danielsen, 2009; Dörnyei & Ushioda, 2010; Krashen, 2003; Moore & Kearsley, 1996). Such principles include the need to:

- Motivate learners through meaningful and learner-focused topics.
- Provide learners with comprehensible input through context-based learning.
- Provide learners with opportunities for real and meaningful interaction through task-based and goal-oriented activities as well as cooperative learning.
- Underline the role of failure in successful language acquisition.
- Encourage learners to experiment and take risks while communicating in the target language.

Smailesa and Gannon-Leary (2011) have studied what is the best virtual model to facilitate a peer mentoring scheme. They analysed three different models: VLE, SNSs and VWs. The authors finally conclude that even though SNSs are the most popular platforms among students, they are not necessarily the most appropriate ones for educational purposes. Furthermore they deduce from their analysis that even though VLEs are well established learning tools within many educational institutions, students are often not interested in them. With regard to the use of VWs, Smailesa and Gannon-Leary maintain that many students are unfamiliar with them and thus often do not have the knowledge to use them successfully.

Unlike Smailesa and Gannon-Leary, we consider that young people are very familiar with VWs. There are, for instance, popular games that provide the skills needed to use VWs. Among those games are for example The Sims as well as Second Life. Nevertheless we believe that sometimes it might be difficult to use VWs in the area of teaching as they often lack of a well defined goal (Berns, Gonzalez-Pardo, &

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[5] http://www.goingon.com/.
[6] http://www.edmodo.com/.