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Technological Readiness for Teaching Practices in Immersive Learning Environments Open Sim

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Abstract: This article presents some results obtained partially during the first year of the TYMMI project. TYMMI's aim is to strengthen the professional performance of pre-service teachers in the real classroom. Through the design of a free immersive virtual world Open Sim we have developed a technology readiness for 27 pre-service high school English teachers who are preparing their career at Universidad Católica de la Santísima Concepcion, in Chile. Initial results show some evidence of working in a three dimensional environment and in a virtual learning platform (called EV@ supported by Moodle) through Sloodle. One of the first findings we have gathered are: motivation for using these environments, strengthening ICT skills, and also technological difficulties for the development of the academic activities of interaction during teaching practices.

Keywords: Virtual Worlds, Open Sim, Sloodle, Teaching Practices
Categories: L.2.3, L.5.0, L.6.1

1 Introduction

Various researchers have investigated the adoption of virtual worlds in educational settings over the last decade [Berns, Gonzalez-Pardo & Camacho, 13; Mikropoulos & Natsis, 11]. Virtual environments, especially those with multiple simultaneous users, have become known for their usefulness: promoting constructive learning [De Lucia, Francese, Passero & Tortora, 09; Jamaludin, Chee & Ho, 09], collaborative learning [Jarmon, Traphagan, Mayrath & Trivedi, 09], improving critical thinking [Herold,

10], allowing developing technological skills [González & Blanco, 11], and they are considered as a didactic resource for teaching as well [Rodríguez & Bañados, 11].
Over the last years, Second Life and Open Sim have been used for professional as virtual environments in order to see their utility in different fields [Chena, Wardenb, Tai, Chend & Chao, 11]. Education field has been proven too. It has shown how the classroom can be transform into a digital space and how students can take different appearance when they become an avatar.

This article aims to present preliminary results of the development of a virtual immersive learning environment for teaching called TYMMI. This island has been design using an open source platform called Open SIM (open simulator). This virtual environment has been developed in order to complement regular classes and improve pre-service teachers' performance by technological readiness and training on immersive learning environments.

2 Technology in education

There is a large body of research related to digital literacy, technological skills gap between students and teachers, technology preferences, and the integration of technologies into the teaching and learning process.

The experience of developed countries indicates the formative potential of the use of Internet to link students and teachers from different places and countries, for example, the formation of identities in a context where the digital world also influences. Valkenburg & Jochen [07] applied a survey to 1210 teenagers between 10 and 17 years old in Germany. They found that interactive networks had a positive effect on teenagers' social skills. In Chile, teenagers between 10 and 16 years old use Internet to be connected with their friends. Additionally, the indicator communication between classmates and teachers shows a tendency to increase, from 12% in 2006, to 28% in 2009. The value of Internet as a tool of benefit to young people has increased positively from 40% in 2006, to 88% in 2009 [ICT Observatory, 09].

Related to digital literacy, behaviors and Venezuelan students' perceptions, Godoy [2009] found that the digital gap is reduced when students start college and their skills are comparable to European students.

Likewise, the impact on relevant aspects is highlighted by UNICEF [11], noting the need for digital literacy for children and youth people because the digital world further separates young people who have the opportunity to benefit from digital technologies from those who do not.

It is recognized that students have digital competences related to the tools with which they most interact, understanding the needs and particularities of the contexts in which these studies have been performed.

The emergence and characteristics of new technologies such as virtual worlds promote student learning and commitment if they are properly applied in educational contexts [Warburton, 09].

Jerónimo, Andrade & Robles [11] mention that learning in a virtual world and social interaction are considered as an educational innovation. According to these authors, 3D spaces allow to use didactic strategies such as role play, base problem learning and case study.

TYMMI has been created particularly with the idea of proposing an educational three dimensional metaverse for improving pre-service teachers' teaching practice through simulations on virtual world.

It is known that one of the resources to improve education quality is technology. Researchers think that including innovative methodologies into teaching and learning process will allow students to both using technology as a learning tool and integrating them better into their future career.

Currently, there is an empowered generation of students (pre-service teacher) who use technologies. We think that this potentiality should be seen reflected on their learning and teaching interaction where they may use virtual worlds and social networks to do it. This situation forces education faculties to make a permanent upgrade on students teaching preparation incorporating virtual environments and so on. About this experience, little evidence have been found, so TYMMI project becomes very important in order to investigate in this field and make a contribution.

3 Methodology

To find classrooms where future teachers are free to try out the techniques learned in college can be very difficult [Mahon, Bryant, Brown & Kim, 10]. Under this context, this research is developed based on a positivist paradigm, with a descriptive and exploratory quantitative methodology. It attempts to examine an understudied topic in order to become familiar with a phenomenon relatively unknown and it seeks to describe various aspects and dimensions that these kinds of studies have [Salinas & Cardenas, 09]. The sample population is composed for 26 pre-service high school English teachers belong to the school of education at Universidad Católica de la Santísima Concepción, in Chile. This sample was selected intentionally using the following criteria: students from section 1 and who are taking the course named Academic Literacy I.

4 Results

The results are focused on: the design of a methodological model working in physical-virtual classrooms, implementation on a 3D immersive Open Sim platform, and training to students for accessing to these resources.

4.1 TEDOMI: Methodological model for teaching in physical-virtual classrooms

The architecture to support the pedagogical work in immersive environments developed for TIMMY, includes in one of its phases to design a conceptual model for teaching technology in immersive worlds TEDOMI. This suggests the interaction of a set of processes with technology components to enhance the simulation focused teaching practices in three dimensional environments such as Second Life (SL) and Open SIM (OS) [Lara & Badilla, 12].

TEDOMI provides resources for pre-service teachers to search, plan and implement educational activities. It ensures an appropriate approach of resources' use

and curricular context. TEDOMI's technology components are: 1) Platform to research, design, and plan; and, 2) Spaces created on immersive virtual worlds where there are digital resources available for teaching and learning. It considers Sloodle as a content management system (see Figure 1).

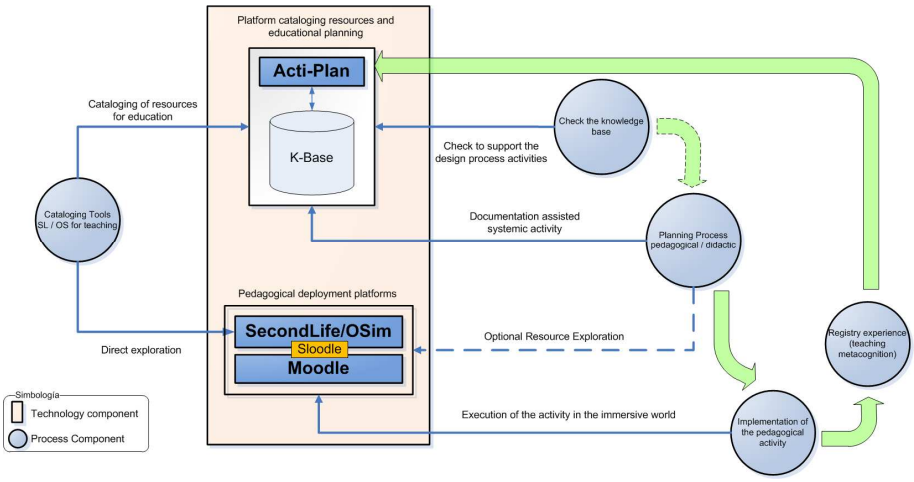

Figure 1: A technological model for teaching in Immersive Worlds: TYMMI Project [Badilla & Lara, 13]

Technological components are represented by Second Life and Open Sim immersive worlds. In these spaces, teaching activities will be performed. The other component is the cataloging of resources and educational planning which are supported by Moodle platform (Sloode); here pre-service teachers upload resources and lesson plans, both before and after the virtual class.

TEDOMI model allows to define frameworks for cataloging tools, consulting the knowledge base, planning of the teaching and recording experience. These processes are not necessarily a strict sequence. The pre-service teacher, depending on their needs and digital gaps, they can use one or all the next processes:

1. Cataloging Tools SL / OS for teaching
2. Check the knowledge base
3. Pedagogical/Didactic Planning Process
4. Implementation of the pedagogical activity
5. Recording the experience (teaching meta cognition)

4.2 TYMMI implementation in Open Sim

During the first year, TYMMI has been implemented in two virtual platforms: Second Life (paid) and Open Sim (free). Open Sim is an open source to simulate virtual environments easily. Its function is to allow many developers to create their virtual world and put it in contact with others immersive virtual worlds that are accessible in Internet.

For this reason, a free space in OpenSim was created, its surface is about 65.536 m2 and its version is 0.7.5. The name of our space (island) is Tymmi. In order to access in it is necessary to create a user name and choose an avatar. The Open Sim software can be downloaded and installed in any computer system.

In this virtual environment we have placed classrooms, learning resources, blackboards, computers, and projectors (see Figures 2 & 3).

Figures 2 & 3: Places and learning resources available at TYMMI Open Sim

4.3 TYMMI access training for pre-service teachers

Once the technological environments were available, we organized the first training section for pre-service teachers.

In order to avoid problems during readiness activities, we focused on making a basic technical requirement, planning the time needed, provide students information about possible access and negation problems, and information about the Tymmi Island such as spaces, distribution, among others.

The readiness training section lasted four hours. The participants were freshmen pre-services high school English teachers. The training was focused on learning how to use Moodle platform which is supported by a Learning Management System (LMS) (http://www.tymmi.cl/lms2) and also they learned about its usability as an immersive platform.

Figures 4 & 5: Workshop Second Life, Moodle and Open Sim.

Learning Management Systems are designed to provide storage space for educational products developed both by the research team and participating students, who are able to independently manage their own spaces by the creation of accounts and individual passwords. Thus, the platform has an active and pedagogical usability, we were able to confirm the fact as well as display their potential.

In order to keep records of the activities undertaken by the students we have linked TYMMI from Open Sim with LMS in Moodle (version 1.9) through the installation and configuration of a component called Sloodle (version 1.2).

The training in the use of Open Sim platform and the educational activities through the interaction with other avatar (pre-service teachers' classmates) showed up positive evidence of motivation and interaction with various spaces and resources implemented in the island.

The activities developed depended on two different kinds of materials. First, the materials uploaded previously in Moodle, such as planning, testing, teaching resources, etc. And second, the synchronic resources which allowed presenting the class in a real time such as chat, microphone and speakers.

5 Conclusions

Form a community of teachers, to explore and catalog ICT resources and share experiences of teaching and learning, in an associated curriculum with different contexts, consolidates a learning curve and constant collaboration among teachers, allowing strengthen the appropriation of ICT resources in their teaching practice. Undoubtedly, this platform has a repository of activities and good practices to incorporate ICT in the classroom, which allows the development of a complementary model of education and virtual learning opportunities where avatars of community members can meet, share and interact in the assimilation process of teaching practices. Moreover, the use of immersive virtual worlds as a teaching resource can trigger high motivation of the students in the development of educational activities, maximizing their learning.

It can be concluded that it is evident that the model provides an implementation process that begins with technology readiness sessions and continue with the implementation of pedagogical challenges in which the student must successfully face different classroom situations using the resources provided both Open Sim and Moodle (planning, teaching and technological resources).

Even though, the positive aspects mentioned above, we have faced some difficulties related with the lack of time that pre-service teachers have to practice autonomously with the resources supplied. Additionally, a technological component has been part of the problems because to work with this kind of environment requires using good technological equipment for the development of academic activities that simulate teaching practices. However, this project provides information that will allow working on virtual platforms in a realistic and contextualize way. Also, we expected to increase ICT skills as well as provide feedback regarding to innovative practices in these environments.

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