Building Knowledge in Virtual Environments – Influence of Interpersonal Relationships: the outlined research

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Abstract. This article presents a PhD research project that will determine how to enhance learning, at the university level, based on implemented experiences in immersive collaborative virtual environments. Today's students belong to a networked and multitasking generation, and today's teaching strategy does not, in many situations, embrace their needs and perspectives. They need to gather competences in order to become motivated, communicative, knowledge builders. It is our belief that educators can take advantage of virtual environments to develop those competences and transfer them to real-world learning contexts.

Keywords: collaborative virtual environments, technology enhanced learning, Connectivism, knowledge building, interpersonal relationships, Second Life

1 The Outlined Research

We are conducting a research study that is being developed as part of a Doctoral Program in Multimedia in Education, under the name *Knowledge Building in Virtual Environments – Influence of Interpersonal Relationships*. The study is being conducted online using the virtual platform Second Life (SL).

The research project emerged from the need to "observe some of the variables that have been already identified by Bettencourt's study and give it continuity"[1]. These variables are related with three major areas: the person and their motivations; the relationships that exist or are established between avatars (SL users) or between avatars and persons; and finally the social integration in SL (by which we mean sense of community). The three main areas are interconnected, and can't be observed independently since they all influence one another. Our research concerns are more focused on learning relationships that are established in the real-world then flow through a Collaborative Virtual Environment (CVE) and back to the real-world again; we are looking to establish whether this flow is complementary. We will observe in-world educators and learners in formal and informal (natural) contexts of learning. Educators and learners – from Portuguese universities and polytechnics – represent our research sample. This is a no-probabilistic intentional type of sample.

It is qualitative study with an inductive and exploratory character. Qualitative studies are defined as being "an inductive form of inquiry (…) that explores

phenomena in their natural settings and uses multi-methods to interpret, understand and bring meaning to them"[2]. It is also defined as an exploratory study because the main data collecting will be achieved through the observation of some identified key indicators (such as the avatar appearance and how the avatar behaves in a learning group or community). This will help determine the level of growth, motivation or socialization of the avatar/person in the CVE. To complement this, surveys (with closed answers) will be used to inquire about the students experience of entering, using and interacting in the CVE – gathering information such as time spent in-world, activities, difficulties, curiosity and level of social integration (e.g. group membership).

The main goals of this research are: (i) analyze several contexts of educators and learners and identify the reasons for them to engage and grow in SL, and what they experience; (ii) understand the way in which interpersonal knowledge in the real world can combine with the personal development/growth in CVEs; (iii) achieve insights to a better understanding of the way knowledge is constructed in CVEs and then transfer it to real-world contexts of learning – with an impact in traditional teaching strategies. We expect this study to provide some "insights for all educators and researchers interested in using those environments as a teaching medium in real life, and propose new approaches to better prepare the university students for the marketplace that will emerge"[1]. To achieve these goals, the research will question the following themes: (i) what are the main reasons/motivations for educators and learners to join SL; (ii) what are the main factors for them to stay and interact in SL; (iii) what are their personal paths of development/growth in SL; (iv) how does interpersonal knowledge cycle around between the real-world and CVEs.

2 State of the Art

We are no longer simple information collectors (Web 1.0), now we are active and reactive users; we develop and share content and information (Web 2.0). Although some authors believe we are in the Web 3.0 era already, relating to "virtual environments in which we meet as avatars, interact as 3D moving objects that takes sharing, co-creation and communication to the next, predictable level"[3]. SL is the best representation of this idea, its environment is like an "ever growing virtual playground that is limited only by the creativity of its users"[4] that allow us "to build 3-D objects collaboratively and in real time with others in the same world [with major applications at] building, design, and art principles"[5]. SL is also a "rough simulation of the natural world, with meteorological and gravitational systems, the possibilities of experimenting with natural and physical sciences are endless [and all this] in a safe and controlled environment"[5]. The educational potential is that, within an immersive environment, we are walking inside the material, not just viewing it from a distance.

For instance, there are many examples of ancient buildings and cities (some of them have already disappeared at real-worl) that can be visited in SL. The Sistine Chapel has been modelled in great detail so we "can fly up to the top of a wall for a close inspection, look down at the inlaid floor, or even sit on a window ledge"[6]. As

Tailor says the “purpose of this re-creation is to explore the use of virtual reality for teaching and learning about art and architecture, by experiencing the context, the scale, and the social aspects of the original”[6]. Another example is the reconstruction of ancient city of Rome [7] or the city of Lisbon pre-earthquake 1755 [8]. The potential is not limited to anthropology or humanities. One example from the physical sciences on molecular motion illustrates how SL can emulate “the way that hot and cold molecules interact with one another in an environment of uneven heat distribution”[9]. In the medical field, some experiments for training medical students are running [10]. SL is also a good environment for language education, which is justified by the fact that “instructions are context-embedded and therefore the approach treats the second language learner as if he/she was learning his/her first language - which incidentally would correspond to the playful type of language learning present in SL”[11]. Some examples of ongoing research in education can also be found at the SLED (Second Life Educators) list [13]. We have perceived that “Education began, slowly, to realize that many of the attributes of great game playing, from the intellectual challenge to the provision of multiple learning styles, had an immediate part to play in learning”[14].

The advantages of the social web are becoming clear, students “have a lot of practice of e-mailing, blogging, googling, chatting, gaming, and so on!”[1]. Students “entering universities after 2000 (…) were portrayed as needing a more media and IT driven learning environment”[15]. But what do they get when they arrive at University today? For the most part it is the same old strategies from the last century; where students “are asked to sit in rows and listen to lectures, take notes or solve exercises given by teachers. It’s a teaching strategy that doesn’t prepare students to be critical citizens and professional workers on their specialty, nor give them the skills and competences needed to be autonomous and constructors of knowledge”[1]. Our students now live in a multimodal and interconnected world and for them this “way of dealing with information is much more intensive than listening to one source of information at a time”[16].

3 Theoretical Framework

We are conducting the research under the theory of Connectivism; a theory for the digital age. According to Siemens, the theories most often used to describe the learning process (Behaviorism, Cognitivism and Constructivism) do not consider the ways that learning is impacted by technology. More often than not, technology “has reorganized how we live, how we communicate, and how we learn”[17], therefore learning theories of the digital age should be reflective, and with a glance at social environments, since learning (especially in its informal and natural form) often is widely influence by it. Other ways of achieving learning have arisen through social networks and the types of connections that the Web allows. As Vaill said, referred by Siemens, “learning must be a way of being – an ongoing set of attitudes and actions by individuals and groups”[17]. It is important that we perceive learning as a “lifelong process of transforming information and experience into knowledge, skills, behaviors, and attitudes"[18]. To learn is to “acquire certain patterns”[19]. It is also the result of

the interactions and connections that we establish with fellows of our community, peers, personal or social networks. In this way "to know something is to be organized in a certain way, to exhibit patterns of connectivity"[19].

We will be using the Connectivism approach because SL embraces its main assumptions. SL enables a contact and connection with a diversity of opinions, nodes, links and specialized information sources. Because it is digital, virtual and immersive it allows those information links to be more interactive, which enhances the learning and information sharing. It is an endless network of links allowing contacts to flow in between virtual platforms (2D, 3D) and real-world. In our opinion, the motivation and sense of community that are generated among SL users helps to create, develop and maintain connections; it facilitates a process of continuous, natural and lifelong learning. The environment has available a huge number of communities and groups serving a wide range of likes, needs, interests. Inside these groups, or communities, relationships are established and information flows. Members build and share, becoming content providers themselves.

Connections are made and the network of relationships grows and gets reinforced progressively. The bonds that are created between the members quite often jump the borders of the 3D CVE. They continue outside through a 2D platform, or even at real-world. Connections are like a snowball effect. The individual network is made of, or complemented by, friends' networks. As Stephenson said "I store my knowledge in my friends"[20]. In this digital age we have a network of connections that is made of links and nodes with others. It is a "collective knowledge through collecting people"[20]. Therefore "Know-how and know-what is being supplemented with know-where (the understanding of where to find knowledge needed)"[17]. The Internet provides new ways of making those connections and provides an extra dimension of collaborative sharing. Knowledge is "distributed, because it is spread across more than one entity. A property of one entity must lead to or become a property of another entity in order for them to be considered connected; the knowledge that results from such connections is connective knowledge"[21].

In a CVE there are no physical barriers or borders. Information flows, people build and share content, relationships are set up, the net of connections extends and knowledge is built. This acquisition is made in a natural way, by participating in a community, by sharing, interact and collaborate, discussing and launching ideas, contents and information, therefore a "learning activity is (...) a conversation undertaken between the learner and the other members of the community"[19]. It is a natural process of interaction and reflection with the guidance and correction of expertise or peers.

4 Preliminary Findings

The research hasn't been fully implemented yet. We are tracing the theoretical framework, gathering the literature that will underpin the study and preparing the materials to be used for data collecting. Consequently, we don't have data to analyse nor discuss at this time. We have some expectations and a priori assumptions that

arose from the initial literature review and from a small pilot study that was developed. We "have used the experience of a pilot to frame questions, collect background information and adapt a research"[22]. The pilot study was a test to gain experience of the use of CVEs in learning contexts. We seek to learn (i) how students engage with web 2.0 tools and CVEs; (ii) whether the tools and the CVEs show improvement in collaboration; (iii) how well the tools and CVEs promote knowledge building.

In the context of the broader research goal, the pilot study was structured to understand how effective a CVE is as a proxy for face-to-face interaction. Some preliminary findings can be drawn. First we found that the initial set up cost of starting SL (the CVE used at pilot) was high (in tutorial days). The students had no prior experience of SL so the first tutorial became a focus for fixing 'new user' issues. The SL environment has a steep learning curve: how to move, how to interact, how to communicate, how to customize. Predominantly this was navigating the world and helping with avatar appearance. However we felt that this was time well spent as rapid integration into the world is an important prerequisite to collaboration. Two in-world sessions were devoted to students' acquisition of basic skills (+- 6 hours during successive weekends). A number of students engaged in-world beyond teaching hours. In future sessions it was easy to see those who had spent more time learning – avatar appearance is one indicator. Another conclusion from the pilot is related with knowledge building which seemed to be a function of maturity, level of independence as learners and intrinsic motivation. The motivation aspect needs deeper evaluation (where free will is involved). On our broader research question, we can also say that the interpersonal relationship that was established between educator and students is an influential factor on performance. In a mature group, the friendship relationships established seemed to be deeper and stronger between educator and students.

Second Life, as a natural and informal immersive collaborative virtual environment, can be used for the set of e-learning 2.0 contexts. Downes defines e-learning 2.0 as being "an approach to learning that is based on conversation and interaction, on sharing, creation and participation, on learning not as a separate activity, but rather, as embedded in meaningful activities such as games or workflows"[19]. In an immersive environment people can live the experience, live the learning, and thereby may learn better. For us these are alternative methods of presenting content, as an attempt to catch and maintain student's attention and motivation. In fact immersive environments could have a huge potential for education because they can facilitate "collaborations, community and experiential learning"[23]. Our idea will allow educators to create a better learning environment by understanding what makes learning the most successful in a CVE. It seems that informal learning is the best approach as this is already practiced by our students. We think that CVE might provide a better online ambiance for informal and natural learning.

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