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Enhancing learning and cooperation through digital virtual worlds

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Abstract. This paper describes an experiment, aiming to explore the potential of Second Life (SL) as a creative teaching approach. It questions the feasibility of implementing SL in the classroom by bringing results of a confirmatory study conducted in a Business School with 168 "non expert" students. The results indicate that even if high level projects can be conducted in SL, non expert students will need to be trained before conducting involving projects. Postgraduate students in business schools know this platform but most of them don't use it (52%). Conclusions, limitations and future ways of research are then presented.

Keywords: virtual world, e-learning, project, e-collaboration

1. Introduction

This paper presents a framework for using virtual worlds in the development of creative teaching approaches. Employees are demanding training for higher performance, knowledge and skills, without requesting time to attend university/school or leaving their work behind. Social computing applications, including virtual worlds (VW) such as Second Life (SL) can provide opportunities to facilitate organizational communication and collaboration within a group of students and teachers or within a group of co-workers. They can ultimately enhance productivity, creativity and even contribute to the protection of the environment with the possibility of distant work.

The aim of this paper is to illustrate views based on past experience from teaching on SL. It particularly focuses on the confluence of interactive tools embedded in SL to enhance productivity in academic settings, as well as on the use of social networks for coordinating and managing projects. It also refers to an exploration into how virtual worlds and social networks in immersive environments can result in opportunities for learning and training in order to impact productivity.

2. Illustration of the methodology

Step 1. Exploratory study

Step 1a. Case study (1 teacher- 7 students) in a Design School (experts in IS)

Step 1b. Questionnaire submitted after their production

Step 1c. Results

Step 2. Confirmatory study

Step 2.a. Questionnaire sent to 168 Business students (non expert in IS)

Step 2b. Results

Step 3. Discussion, conclusions and limits

3. Building projects and learning on Second Life: a case study

In this part of the paper, we analyze the methods and processes implemented as part of a prospective project led in a Design School in France. This project was entitled: "Spime Design: Design concepts for the

Internet of things in a virtual environment". A Spime designates a neologism, invented by Bruce Sterling1. The contemporary technological developments converge in what is commonly named the "NBIC", abbreviation that designates the assembly consisting of Nanotechnology, Biotechnology, Information Technology and Cognitive Science (Wolbring, 2008). This is the origin of the presented project. Technological developments now allow imagining and creating what was recognized as strictly science fiction yesterday.

3.1. Description of the preliminary experiment

The students were postgraduate students, considered as experts of new technologies. As web designers, they build websites, create animation using vector animated software. Some of them work in the industry and are open to try new projects as the one we proposed: building a project in its entirety on SL, and getting marked on SL as well. The latter took place in class and via the internet during May 2009 with a group of seven students enrolled in a postgraduate course with the optional major called "virtual reality". The project also involved a range of partners at different levels of intervention and two professors.

The seven students worked exclusively on the online development of their futuristic concept of "Spime" in SL precisely on the plot provided by the metalab3D, a space dedicated to surveillance and testing which worked with the Design School. Thus the concept of Spime defines well what we seek to develop in this prospective project. "Spime" is a contraction of "space" and "time", and designates "an object precisely localized in time and space [...] always associated with a history." In the project context described in this paper, this object can be issued from life technologies. It is necessarily interacting with its environment where other Spime and human beings, represented by avatars, evolve. The aim of this project is to implement creative methods that deploy the imagination of the designer at the level of technological developments. It is intended to formulate prospective concepts into the field of "Internet of things". The concepts of Spimes built by students will finally be represented, modeled and shared in virtual multi-user environments such as SL.

3.2. Method

Effectively accompanied during 3 days by an expert each of the seven students was able to use the LSL (scripting Language of Second Life) according to his/her own project. S/he was thus able to develop a simulation of a prototype of Spime imagined before the beginning of this intensive week (Figure 1). The latest has been concluded by a thesis project, directly conducted in SL, Friday 19th of May, from 2 to 3.30 pm, French time. Each project has resulted in an oral presentation by its author as well as a demo/test capabilities developed. Below is a screenshot describing the latest.

Fig. 1: Erogar, with red gloves and a sexy white dressing code tests the system proposed by Mitch Zufreur benches that enables remote sharing of environmental perception.

[1] Michael Bruce Sterling (born April 14, 1954) is an American science fiction author, best known for his novels and his work on the *Mirrorshades* anthology, which helped define the cyberpunk genre.

The objective of this article was to discover 1) if students could benefit from a tutorial on a 3D Virtual Word (3DVW), and 2) if students were able to evocate SL or if they already worked on this platform. The results of the experiment based on an exploratory study where two professors followed seven students in design, considered as experts in this study, are positive. Students and professors have appreciated the possibilities offered by SL and would even recommend it to other students and professors respectively. Both mention that new interactive methods should be used to work, study or manage projects, in order to provide efficient e-learning skills and tools so as to offer better results or better proposals related to the topic of the covered project. The cultural benefit associated to this experience of working on a 3DVW, has also been mentioned by the students and professors we interviewed when the experiment was completed. The possibilities offered on SL to conceive and experiment their ideas, revealed to be a strength. This training framework can also be utilized in business and industry.

After having conducted this experiment and interviewed students and professors, a survey was conducted. Its aim was to foresee the possibility to use SL in a common teaching field such as management. In this type of faculty or business school, students are not as experts with interactive technologies such as SL as in a Design School. We thus wished to ask these future managers if they knew this 3DVW and were ready to use it and work on/with it. Results show that most students knowing SL have already visited the site. However, most students knowing SL but who never visit it, adopt this behavior due to a lack of time. This is not the most positive answer we have obtained since students in management appear to be reluctant with SL. Indeed, results indicate that SL users belong to the population of expert users since the time they spend on the Internet appears to be high, with more than two hours a day spent on the Internet. An interesting result extracted from the survey we conducted, indicates that SL is more visited or used for recreational purposes than for commercial ones. This result permits to go further, indicating that the potential of this 3DVW is not limited to its offered skills, tools, or programming possibilities. Social networks already proved how interesting they were in terms of easy to use content management systems (Pelet, 2010), 3DVW may reach another boundary, providing users with recreational possibilities.

Unfortunately, it seems obvious that SL users need to train and receive more information about the possibilities offered on the platform. The questions we asked ourselves as lecturers firstly asked if the fact of working on SL could generate emerging methods that could be modeled. It seems obvious, taking into account the fact that the preliminary study was conducted with expert users, that: indeed, 3DVWs such as SL permit us to understand the best practices chosen by students to attain their objectives. It also underlined the eventual difficulties that non expert users would meet if they were asked to work on this platform without getting some training before.

We secondly tried to know which methods could be used in complex projects to drive organizational and pedagogical projects. Our practice based on meetings scheduled in advance have proven reliable enough to collaborate efficiently between professors and students. Communication between each other was easy to maintain, thanks to the oral and written tools provided by the 3DVW. The easy to learn programming code used on SL helped students to conceive and build their prototype in order to be able to present it after one week only spent on SL. These findings allow us to say that a simple interaction conducted at the same time could be sufficient to conduct or manage complex projects in the context of organizational and pedagogical projects.

Finally, we can easily argue that the provided tools and skills offered on the platform and from professional users of SL had an impact on the methodological process of using SL.The framework for training, studying and prototyping in SL takes advantage of the affordances available in immersive 3D virtual worlds as we have understood during the exploratory analysis. A number of positive implications for this type of teaching emerged during the interviews conducted after this experimentation. Four of these implications can be simply summarized:

- First, the “any time”, “any place” nature of the virtual environments helps to the enhancement of the “on demand” requirements of e-learning;

- Secondly, changing professor roles in virtual environments allows them to focus on individual development, from which both the individual and the workplace benefit;

- Thirdly, it is possible to minimize time and costs for student and professor journeys, time off work, and orientation while maximizing student learning with particular projects ;

- Finally, trainers can provide the required scaffolding while off-loading instructor time and effort. The latest seems to be the most important to take into account, if we consider the students who are deemed as non experts in interactive technology users.

3.3. Limitations

As with any research, this study comes with limitations. First of all, the exploratory experimentation was conducted during a short period of time. Students felt frustrated by this. Another experiment for a longer period may bring to the fore more weaknesses that could be useful conducting a stronger confirmatory experiment. In addition, data from the confirmatory experimentation were collected with students that were not aware of the existence of SL and thus, most of them did not know the possibilities offered on this 3DVW. Furthermore, projects already made on SL were not possible to be shown and explained for acquiring a more precise idea regarding the features offered on SL. Even if the first study asseses whether students can learn and manage projects in SL, as experts of web technologies, non experts perceptions of SL (second study) can look unrelated at first glance.

Critical incidents related to the first study could be described in greater detail. No trouble occurred during this phase. More extensive interviews, more comparisons between projects, more characterization of the problems of the project would be useful. The fact that both teachers and students were familiar with SL, leading to an overall success of this experiment is an important limitation. What worked and didn't work between teachers and students could also provide greater insight on possible critical incidents.

The second study could provide more results. For example, more questions could have been asked regarding whether non experts expect business to adopt SL, or whether they think they need to learn it. What do they think would be hardest thing about using SL, or essentially, what reservations do they have regarding SL. Alternatively, maybe that a more interesting study would have been to let non-experts do a task or have a discussion in SL and then compare their feeling about the activity to expert perceptions of their project process.

Indeed, most of the data collected beyond expert use shows the demographics of the potential user pool. It does not offer explanations about the novice's capability to use SL, how long or how difficult it would be to learn, what the major obstacles are, etc. These are questions we intend to pose in the next study we will conduct.

Thus, the quantitative dataset is not highly supplemental to the first dataset. While these figures are useful for a professor to use when deciding to implement a SL project, they do not seem to relate to actual use of SL, just the potential for use.

In parallel to these limits, we could also add that most of the available statistics made by SL or Kzero have not been updated for a while. It might mean the industry is focused much more on the development of other virtual worlds. We also focused on students only whereas professors and professionals in general may also be interested about e-learning with SL and willing to use those tools. We should also study the motivations of the students not to go to SL. Finally, generalization of findings to all types of students should be made with caution.

3.4. Future research

Future research related to the possibilities offered by 3DVW and especially SL to enhance learning and cooperation through digital virtual worlds could take into account the adoption of this platform for the experiment. The researcher should undoubtedly take into consideration the fact that SL is not known by everyone. As explained earlier, studying the pedagogical methods employed on this type of platform would probably bring more useful results regarding the offered possibilities if more time was spent during an exploratory study to understand the threats and weaknesses when using it. This would require a replication of the experiment during a longer period and maybe some months or years after the first one, with the same respondents and the same conditions. Coupled with the use of Digital Social Networks, further studies would enable us to reach a better understanding of the effects from a pedagogical point of view of the interaction

pervading 3DVW websites and the knowledge acquired thanks to platforms such as Facebook, Twitter and LinkedIn on students and professors. It would help us adopt a holistic rather than an individual approach to the phenomenon. Finally, besides learning and cooperation, further research should examine the entertaining aspect of 3DVW, in the objective to learn more about colleagues, collaborators or partners to work with. Similar to traditional activities for team building, such as sports or laser game or paint ball during seminars, SL may be useful to build stronger relationships between each other, thanks to the immersive environment enabling users to do almost anything, anywhere, at anytime.

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