Implementing Second Life in Higher Education: A Review Literature

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Abstract

Many educators around the world have shown an interest in three-dimensional virtual world such as second life in order to increase the level of student engagement. This paper aims to study on the implementation of second life in Higher Education. The research methodology was analyzing and synthesizing the literature review. The literatures were reviewed to determine items relevant to three-dimension virtual world environment, second life, implementation and outcome. A total of 58 papers, published from 2003 to 2012, were selected from articles, documents, websites and related research. The result of implementing second life in higher education reveled the elements of learning outcome: increase level of student engagement and the elements of concept in using of three-dimensional virtual world in 4 factors: 1) Metaphorical projection 2) Virtual reality system 3) learning module and 4) Designers, students, teachers. These factors are important components of educational virtual world in order to achieve the success of using second life for enhance students engagement in learning.

Keywords: Second life, Higher Education, Engagement

Background of the study

Globalization has brought about dramatic changes to the current world. These changes raise tough challenges about how to develop countries. Due to the changes of social structures in the 21st century many countries are preparing to encounter new society, technologies, economy and politics. Higher educational institutions take advantage of advanced technology by employing games as a form of simulation, in order to enhance their learners' learning processes. Simulation is recognized as a successful tool, widely used in training and work-based learning (Whitton & Moseley, 2012: 9). Nowadays, virtual worlds have appeared in educational systems as a social network, where users create avatars to represent themselves. Users are able to create their own avatars which represent their gender, dress sense or even hairstyle, and their environment as they wish. In virtual worlds users can communicate, move, build and interact with others through their avatars. A virtual world is a three-dimensional virtual world where users are able to fly, walk under water or move to other places, via an internet network. People in virtual worlds are free to do and to be anything, depending upon their own designs (Educause, 2006).

In 2003, Linden Laboratories developed a 'Virtual World Program' by creating 'Second Life' (SL), which enables learners to instantly respond and manage information used to interact with others. Through developed SL, limitations about access to places are eliminated (Rogers, 2011). Nowadays, numbers of virtual educational institutions have been substantially increased. They provide a wealth of knowledge and experience for enhancing the effectiveness of the learning environment (Bulu, 2012). In addition, Gartner, a world leading company which conducts research about technology, mentioned that educational institutions are more likely to adopt virtual worlds into their systems within the next 5-10 years (Gartner Inc, 2009). This is due to the fact that virtual worlds are able to create ideal learning environments which suit a wide range of teaching and learning contexts (Loureiro and Bettencourt, 2011). Virtual worlds powerfully attract learners' interests, because learners can express their true selves, identities and social environments through their created avatars. In doing so, within the use of voice and message, interaction through computer networks under occurs (Rogers, 2011).

It is evident that higher educational institutions have applied SL to their teaching and learning activities by setting up a community of virtual world learners. This community provides a simulated environment of open class, and uses online teaching as a teaching instruction. The faculty of Law at Harvard University is one of higher educational institutions where SL has been adopted. Moreover, Harvard Extension School opens a joined classroom where there is provision of a court simulation. Similarly, Ohio University uses SL as a tool for individual learning development, which allows learners not to need to attend lectures. It also provides a university simulation center known as 'Learning Stores', where leaners can access learning anywhere at any time. Importantly, Ohio University created University Simulation, where all university buildings, such as the Learner Center, Learning Center and the Art and Culture Center are included. This University Simulation enables learners to take a journey into it and join a real 'learners' association', at the Learner Center. In joining University Simulation, learners interact and work with others as they would in the real world. Characteristics of virtual worlds which enable users to build and control programs by themselves are useful for learners and teachers in improving learning content. Virtual worlds offer a good chance for teachers to potentially create well-designed instructional materials and tools, which are essential for increasing

interaction between learners and learning content (Zhang, 2007). Virtual worlds are useful for teaching and learning instruction because teachers can use a wide range of instructional materials within the virtual world environment. Also, virtual worlds provide rooms for users to exchange their opinions. As a result, virtual worlds are regarded as effective tools which are used for fostering teaching and learning processes, and successfully motivate learners' interests, thus resulting in better learning outcomes.

A research study of Wang and Braman (2009) indicated that integrated activities in Second Life (SL) helped to enhance learners' learning experiences, and motivated them to place more attention on their learning, which in turn results in increasing the standard of their learning outcomes. In Thailand, Assumption University and Rangsit University were recognized as the first two higher educational institutions where Second Life was adopted for teaching and the learning process. Furthermore, a number of research studies have pointed out that suitable learning and teaching environments, created in virtual worlds, can foster learners' attitudes toward philosophy and psychology (Peter, 2009), and bring about a thorough understanding of suitable teaching and learning environments. The research reveal that developments in technology greatly influence development in teaching and learning methodologies in education. This development aims to enable people to access education more easily.

It can clearly be observed that Second Life has significantly appeared in higher education. Consequently, the researchers were interested in investigating the implementation of Second Life in higher education: a review literature to analyze and synthesize related documents about the implementation of Second Life in higher education.

Research Methodology

This study is a qualitative research. Documentary research was applied to synthesize the concepts of the implementation of Second Life and its learning outcomes in higher education. This study aims to provide content analysis of 58 published documents from 2003 to 2012, including both national and international academic documents, such as: books, academic journals and related research, as well as electronic documents from websites about Second Life. Related documents were closely examined, and in-depth interviews were applied. Then, the collected data was categorized into frequency distribution tables and synthesized to provide a summary of the implementation of Second Life into teaching and learning development. The data obtained from in-depth interviews was analyzed in the same way, to identify components of Second Life used for teaching and learning development, in higher education.

Findings

The findings of psychological studies reveal that ten percent of human memory occurs through reading, and thirty percent through sight. On the contrary, fifty percent of human memory takes place through interaction with others, and up to ninety percent takes place from practice (Rogers, 2011). It was found that elements of Second Life (SL) comprised 4 factors: 1) Metaphorical projection, 2) Virtual reality system, 3) Learning module, and 4) Designers, students, teachers (Sanchez et al., 2000). The findings are discussed in detail, as follows:

1. Metaphorical projection

Metaphorical projection is a bridge between the real world and the virtual world. To have clearer vision, and more comprehensive understanding of metaphorical projection, information gained from the real world and the virtual world needs to be linked together. Virtual world environments are particularly suitable for imparting abstract knowledge, theories or philosophical concepts. That is, the contents of abstract knowledge, theories or philosophical concepts are beyond seeing or illustrating in the real world, cannot be described through examples, and cannot be touched, sensed or illustrated through graphs or instructions. Metaphorical projection can be categorized into four planes (Sanchez et al., 2000), as follows:

1.1. A structural plane is a symbol used for linking knowledge between the real world and the virtual world. This symbol, or metaphor, creates virtual world environments which provide better understanding for learners (Structural similarity between the virtual world scenario and learners' previous experiences will help learners to better understand the contents).

1.2. A learning plane serves to design teaching methodologies. For example, a learning plane is used to design activities which enable learners to engage in virtual worlds pertaining to the roles of teacher and learner. The structural and learning planes are the most crucial components of the metaphorical projection, because they determine the other two additional planes.

1.3. A navigation plane should be designed based upon how learners browse and move around in virtual worlds (walking, driving, flying, using transportation tools, etc.) dependent upon contents and learners' perspectives.

1.4. An interaction plane establishes how learners interact within virtual worlds, how they manipulate what they encounter, and how they communicate with others.

To this point, it can be summarized that the SL program accurately simulates every learning environment, and enhances the effectiveness of human memory. Under an applicable virtual world environment, learners are able to fully practice required skills, construct new skills and reduce their anxiety, leading learners to recognize their own potential. Additionally, their abilities of learning and problem solving will be increased too. It was also found that virtual world environments are able to motivate learners to utilize knowledge gained from practice as a means to solve problems, and to enable learners to be more engaged in classroom activities. Besides, virtual world environments encourage learners to adopt creative education, which is an important skill in problem solving (Hsiao et al., 2006) because imagination brings about creativity, new concepts and problem solving methods. Through this process a body of knowledge can be constructed (Hung, Rauch and Liaw, 2010). Creative education will become successful when the learning environment enables learners to freely share and exchange their opinions, essential to constructing a new body of knowledge and concepts (Infinite innovation, 2006).

California State University created a SL program used for its psychology course about hallucinations, in order to facilitate learners to have experience and comprehensive understanding about psychiatric patients who encountered hallucinations (Yellowlees et al., 2006). In addition, SL is used to describe brain disorders, or situations which are difficult to understand or are rarely seen in daily life. Advantages of virtual world environments are: 1) virtual world environments are less costly when compared to environments in the real world; for example, expensive instructional materials in the

real world can be simulated in a virtual world; 2) virtual worlds create more interaction, because there are no limitations of time and place; learners are able to learn anywhere and at anytime; 3) virtual worlds reduce risks and dangers which obviously occur in the real world; 4) virtual worlds bring about creativity because learners build up their creative imagination in presenting learning contents and patterns; virtual worlds also motivate learners to seek additional knowledge, and; 5) virtual worlds offer room for learners to share knowledge and opinions, leading to learners' diverse perspectives where learners can use social media to exchange knowledge and support each other's thoughts.

2. **Virtual reality system**

A virtual reality system is constructed by a computer program based upon a three-dimensional virtual world environment, which allows learners to engage and interact with others in virtual worlds via a computer system (Sanchez et al., 2000). Features of the computer program are presented, as follows:

   2.1 Presence: learners will feel that they are in a real place, and not in a computer-simulated scenario.

   2.2 Navigation: leaners can take the role as immobile observers or travelers in virtual worlds. They can stay still or move around in different ways.

   2.3 Scale: the scale of a virtual world environment can be adjusted by changing the size of users in virtual worlds (It is not to maximize the size of virtual worlds, but to minimize the size of the users.)

   2.4 Viewpoint: learners can change their perspectives whenever they want, or even use the viewpoints of another user. Those can also be floating or moving viewpoints.

   2.5 User-environment interaction: learners can manipulate and modify virtual worlds freely. They can move virtual objects by hand, eye movement or voice recognition, and have the ability to create and adjust the virtual world environment.

   2.6 Autonomy: to achieve the goals of learning, a virtual world environment is autonomous and able to change all the time. Actions may take place and respond to the goals, irrespective of the learner's interactions.

   2.7 Co-operative learning: under the networked environments, several learners can share virtual world spaces at the same time.

In order to create interesting, applicable, convenient and attractive virtual world systems, learners' computer competencies should be taken into account. To be more specific, a virtual world program should facilitate new learners by providing an introduction and site navigation. On the other hand, virtual world system programmers should suit experienced learners' needs with a wide range of computer competencies regarding their individual potential (Bignell and Parson. 2010). In a teaching and learning context, SL is used via two-way communication, one-way communication or face-to-face communication. SL provides a computer network which allows learners to communicate through different channels. Therefore, SL plays a significant role in teaching and learning development. Virtual world systems are categorized into two types, as follows: The first type is 'Synchronous' learning, where teaching and learning activities take place at the same time. All learners must attend classes and interact with each other at the same time. Examples of synchronous teaching and learning activities are: chat and information, sounds, pictures and

animation exchanging. The second type is 'Asynchronous' learning, where teaching and learning activities are conducted in a virtual world, and where learners and teachers are not required to engage in activities at the same time. One example of asynchronous learning activities is e-mail, where learners can access e-mail anywhere and at anytime (Zhao, 1998). Asynchronous learning gives maximum benefits to teachers and learners.

The example from the study of Herold (2010) demonstrated that the teaching measurement in SL is conducted by the use of a 'blended learning model', combined with teaching in the classroom. It was found that having knowledge of techniques, or knowledge of computers, affected learning in the virtual world, of students in higher education, less than the measurement of learning efficiency. Using a virtual world system for maximum effectiveness should realize encouraged participation. An operating system for inspection was required, whether they participated in the activity or not. It included creating the system to be more interesting for learning, thereby encouraging a desire for learning. In addition, students could create, edit or change the system, resulting in more class participation.

When analyzing the nature of learning in the regular classroom and the virtual classroom, it was found that the virtual classroom can be accessed anywhere and at anytime, and also have an unlimited number of students. This can be summarized as follows:

Table of comparison between the regular classroom and the virtual classroom

Factors	Virtual Classroom	Regular Classroom
Students	- Self organized learning experiences - Persistence with or without user's presence - Learn anywhere anytime - Rapid Response - Socialization by develop close co-operation with others within and outside class - Real time and direct interaction with visitors who can enter the class (other instructors for instance). - Feel belonging in a community, presence, sense of class community, high level of engagement, strong bond between students.	- Presence in Classroom - Difficult to develop close co-operation with others within and outside class - Take more time to interact and response
Teachers	- Flexibility in time-space	- Time is limited only in

		classroom
	- Follow students process response to students immediately - Very high motivation for new teaching methods and tools - Computer literacy - Willing to have a closer interaction with students - Being able to be a facilitator and a moderator	- Take time to response and have close interaction with students - Knowledge of technology is required - Being a lecturer rather than facilitator and moderator
Classroom	- learn anywhere anytime - Interactive environment - Interactivity of multi-media learning - Use computer for learning	-Learning is limited in classroom - Class schedule is fixed - Resources is limited.

It was also found that the virtual classroom still had many limitations: 1) equipment and software for schooling in a virtual classroom was expensive, 2) delays in waiting for feedback, thus students could not get answers immediately when they wanted them from the teacher, 3) students must have the necessary skills to use computers efficiently, 4) studying interaction is not natural or is too little, and 5) most students still lacked responsibility for self-learning, which is an important attribute of learning in the virtual classroom.

3. Learning module

The learning module is the process of creating the lessons. It required consideration of the purposes of the study and to realize the participation of the students, and was applied using technology that supported the schooling. The use of SL was another tool that could enable the students to access lessons easily by using only a mobile phone and network communications (Gardner, 2006), and create good lessons. The following processes required both the theoretical and practical contents to be as correct as the theory. They should indicate which theory is the best for development. In presenting, the contents must be placed in order: from easy to difficult, from a general overview to detailed subtopics, and from the concrete to the abstract. This led to benefits gained in the essential theory of learning, as well. The levels of increase for easy and difficult should suit the target group (E-Learning Association of Thailand, 2013). Using the SL could be designed to meet the lifestyle, and then modified to match the current situation. Using the basic principles of SL enabled the space for sharing experiences, participating, and demonstrating opinions that could upgrade the skill developments of students.

One example from the study of Meggs et al. (2011) adopted the SL for use with students in the Faculty of Interior Design. A part of the lesson would present the students' designs in the form of displays for an exhibition. Students had to analyze

and criticize their work, and that of peer students, in the form of a message box shown in the SL. As a result, students were taught skills in outlining the strengths and weaknesses of their work and that of others. Furthermore, students were also trained in communication skills, explained the concepts of work, and they could study the work of senior students who had studied in the previous semester from the gallery in the SL. Selective criticism lessons between teachers and students, through video or inquiry in the SL, was the method used to increase participation in the lessons or give freedom to students. Integrating the groups, or selecting the topics students are interested in, was also another way to increase motivation in the lessons.

With regard to business administration, Johnson (2008) said SL program users could create and manage the objectives and participation of activities, social varieties and commercial activities. Activities supporting in-depth aspects and networks, which helped running business and stores as well as the concepts relating to business in the SL, were a unique economic model. The SL had its own monetary and currency exchange service (Linden), and transactions in the SL could flourish and grow just as in the real world. Protection of the rights of intellectual property and virtual objects created in the SL was also established. In addition, users could also convert Linden dollars in the SL with real world money. Business activities in SL entrepreneurs enabled the start up and running of virtual businesses (Mennecke, 2008), which conforms with Castronova (2005) who demonstrated diverse environments, and the motivation to make the users play roles in and participate in social and business activities. Businesses in the SL were the functions that included elements related to market demand and supply of chain management and information systems, including ideas related to: the purchase processes of consumers, characteristics of goods and services, the roles of human behavior and the processes of entrepreneurs. Applying the SL to marketing focused upon the significance of organizational and contextual factors influencing e-commerce systems. Therefore, students could learn, attend the activities and increase their experiences of solving real-life problems. As presented by business leaders and entrepreneurs, the SL offered a unique environment to facilitate the training of the vocational experience of students (Balkun, 2008). He said that participated learning and teaching was not only participation from students but that the environment around them also affected the interaction of students, and further their motivation to engage in e-commerce in the form of SL (Balkun, 2008).

4. Designers, students, and teachers

Designers', students' and teachers' educational studies demonstrated education from past to present and through to the future. The schooling patterns changed as the context of technology played more important roles. In addition, current technology can be applied to support various activities for schooling very well. It merged the interaction among designers, teachers and students. Since 2000 onwards, SL has gradually played a more important role in assisting schooling. Instructional design has provided great roles in offering students knowledge which is based upon the process of learning. The designer should be aware that the content is accurate, and reflects the academic principles. Furthermore, the learning modules have attributed to the development of content (E-Learning Association of Thailand, 2013). For example, SL was a part of the curriculum of business administration. Initially, teachers played a role in the concepts and the framework of the curriculum. This also included coordination among joint-stock companies. Planning and running a business on the

SL involved the issue of a questionnaire for students to explore the understandings of property and culture, and economic systems existed in the SL for developing models of business plans. Students are enabled to attempt doing business in a simulated world for the practical experiences of learning. The activities of entrepreneurs and businesses in the virtual world showed that students responded in positive ways to the SL, and that the SL provided schooling which was a useful environment for teachers. They accepted that the SL might be a powerful tool for communication, because it allows students to interact with teachers in a casual and flexible manner and promotes participation in the lessons. The application of the systems in a computer has been designed to change needs of students: changes related to schooling by approaching the lessons as much as possible. Therefore, it was necessary to create a system that effectively could connect students, teachers and lessons together. We needed experts who had expertise in computer operating systems which could meet the needs of students and teachers (Potkonjak, 2010). Creating a simulated environment in the operating system was challenging to the ability of the designers and the SL creators, because teachers who had knowledge and understanding of the lessons tended to have no expertise in created or simulated situations involving the lessons. In addition, technicians had no expertise so they could not simulate the environment of students without prior knowledge and understanding of the lessons. Thus, the cooperation of personnel of the board and technical experts was important in creating the simulated environment (Keengwe, 2009). Teachers should have basic tests to find out the activities which would support student interest and involvement in the lessons as much as possible. They should also focus on the factors that lead to failure, such as problems with communication or understanding the SL application. These factors should be driven to a minimum for the required importance of practice in the learning program application, in order to prevent problems in practical use.

Conclusion:

The study to apply 'Second life' in higher education: the literature review at this time found that there were necessary elements of second life application in higher education: 1) the metaphorical presentation, 2)the virtual world, 3) the learning modules, and 4) designers, teachers and students. All four elements were learning which focused upon students and which supported them in building knowledge by themselves. It conformed to the 'Constructionism theory' of Papert (1991) (cited in the University of Technology, Thonburi, 2005) based upon two creation processes: 1) the process that students learnt new knowledge by themselves, but it did not get the flow of information into the brains of students alone: knowledge derived from the interpretation of the experience gained, and 2) the learning process would be the most effective if it was meaningful to students. Constructionism held the following principles: 1) the principle that students have built knowledge by themselves. The Constructionism principle was the building of knowledge by themselves, and where students completed learning activities or had significant interaction with their external environment. It included the interaction of student knowledge, experiences and their external environment. Learning could be effective if students understood themselves and considered the importance of what they have learned, as well as be able to transfer knowledge between the new and the old (in that they knew what they have learned), and thus build up additional new knowledge. When considering that regular school learning happens in the classroom; 2) the principle of a student center was conducted and teachers should try to arrange the teaching atmosphere to allow

students to practice their learning activities with many choices, and happily learn to link between new knowledge and old knowledge. Teachers were only assistants and facilitators; 3) learning principles from the experience and the environment highlighted the collaborative importance of social values. Thus, students considered that humanism was another important source of knowledge, when teaching Constructionism theory. It was deemed to be an experience of facing the real world, if students considered that humans are a key source of knowledge, and they can share knowledge. When they graduate, it is easy to adapt themselves and work efficiently with other people; and 4) the principle used technology as a tool. Seeking for answers from multiple knowledge resources results in self-ingrained behaviors of students; "Learn how to learn".

Recommendation:

The study to apply Second life to higher education: the literature review has the following recommendations:

1. Recommendations for higher educational institutions

Higher educational institutions should use Second life to develop schooling and foster the skills of students in the higher education. It is becasue Second life is similar to online games which allow students to play by using characters to represent them. The game will provide many activities for students, depending upon what they create or imagine. Teachers can build learning activities for Second life as a continuous activity. The levels of ease and difficulty will be classified in order to encourage students to overcome such activities. However, second life should also be used with schooling in the classroom, and take into account the age of students in individual cases. In particular, communication must conform to being for the purposes of education only. It should not violate personal life, and private moments should not be shared nor vilolated. With regard to the contents in the case of building materials under the Second life world, the actual copyright of the owner must be considered, because all information has probably been specified as the copyright of the Second life builder.

2. Recommendations for further research

Further study should be conducted in order to develop the virtual world of Second life, in order to strengthen the essential skills required for vocational students. As most current schooling in vocational education is learning a profession, so to apply knowledge to that profession. It differs from learning in general education. Practical classes are much more than theoretical classes, and result in students having greater working skills, than general educational students, because of their real life experiences. However, there is theoretical learning that leads to real practice. Thus, applying technology is another way to contribute knowledge and understanding to students in lessons, through real practices adding more skills before entering the labor market, in the future.

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