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ORIGINAL

Strategy for improving learning in the Financial Tools and Project Management Course through the use of Second Life-SL

Estrategia para el mejoramiento del aprendizaje del Curso de Herramientas Financieras y Gestión de Proyectos a partir del uso de Second Life-SL

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ABSTRACT

This research addresses the difficulty of achieving active learning in financial areas through virtual education. The aim of the study was to evaluate a strategy for improving the learning of the Financial Tools and Project Evaluation (HFEP) course using the Second Life (SL) platform. A mixed research approach was used and data was processed using Excel, Atlas ti, and Ucinet programs. Results indicated that although the use of information and communication technologies (ICT) in learning is inevitable, approximately 70 % of students were not familiar with the tool and had never seen a class in a 3D space. However, once they became familiar with SL, 69,6 % of students considered their management level to be low to medium difficulty. Likewise, students associated the use of SL with attitudinal, pedagogical, and technological elements, expressing that it was interesting, entertaining, and novel. Finally, students considered SL to be a very useful tool for the HFEP course, as it allowed them to better understand topics such as project time, budget, and scope. With the pandemic, the use of ICT in teaching processes has spread worldwide, but traditional tools are still the most used. Students are open to new experiences and consider virtual education to be monotonous. One of the challenges of virtual education is to achieve active learning and for the tools implemented in teaching to contribute to skill development. The use of SL contributes greatly to this purpose.

Keywords: Virtual Education; Second Life; Atlas ti; Ucinet; Learning.

RESUMEN

Esta investigación aborda la dificultad de lograr un aprendizaje activo en áreas financieras mediante la educación virtual. El objetivo del estudio fue evaluar una estrategia para mejorar el aprendizaje del curso de Herramientas Financieras y Evaluación de Proyectos (HFEP) utilizando la plataforma Second Life (SL). Se realizó un enfoque de investigación mixto y se procesaron los datos con los programas Excel, Atlas ti y Ucinet. Los resultados indicaron que, aunque el uso de las tecnologías de la información y la comunicación (TIC) en el aprendizaje es inevitable, aproximadamente el 70 % de los estudiantes no conocían la herramienta y nunca habían visto una clase en un espacio 3D. Sin embargo, una vez que conocieron SL, el 69,6 % de los estudiantes consideró que su manejo tenía un nivel de dificultad bajo a medio. Asimismo, los estudiantes asociaron el uso de SL con elementos de tipo actitudinal, pedagógico y tecnológico, expresando que era interesante, entretenido y novedoso. Finalmente, los estudiantes consideraron que SL resultó ser una herramienta muy útil para el curso de HFEP, ya que les permitió comprender mejor temas como el tiempo, presupuesto y alcance del proyecto. Con la pandemia, el uso de las TIC en los procesos de enseñanza se ha extendido en todo el mundo, pero las herramientas más utilizadas son las tradicionales. Los estudiantes están abiertos a nuevas experiencias y consideran que la educación virtual es monótona. Uno de los desafíos de la educación

virtual es lograr un aprendizaje activo y que las herramientas implementadas en la enseñanza contribuyan a desarrollar habilidades. El uso de SL contribuye en gran medida a este propósito.

Palabras clave: Educación Virtual; Second Life; Atlas ti; Ucinet; Aprendizaje.

INTRODUCTION

Active learning refers to a person learning by himself/herself;[1] unlike passive learning, where the information is conveyed to students, this kind of learning requires that students carry out activities allowing them to develop their skills to a greater extent.[2,3]

The great ally of active learning is the Information and Communication Technologies (ICTs), seeking more interaction and collaboration between professor-students, students-students, students-environment, where they are more deeply engaged in the academic space and the thematic units that are developed, reaching invaluable social skills.[4]

Active Learning can be made possible only through the relation with the other, in a judgment of reflection where diverse skills are attained in the action of the individuals, which is shown when they perform a given task. For his part, Harrison[5] insists on the reflective aspect of this process because it results in different actions making it possible to expand the intellectual capability of human beings.

Like Silberman et al.[5], who highlight the reflective and interactive aspect of active learning, Schwartz et al.[6] and Aritizabal et al.[7] draw attention to the experiential nature, the experimentation, and the relevance of learning through practice and life experiences of one´s own in their contexts.

Among the benefits of active learning is that the student gets a deeper understanding of the subject matter there is feedback between professors and students and students enjoy the diverse learning styles. This way of learning revitalizes a positive attitude and benefits the parties involved. As regards the costs of this kind of learning, they are related to the fact that more time is required for teaching so that fewer topics can be covered within the time allocated; likewise, there are students with few skills for independent work, and they need more company and, finally, the process of preparing the lesson takes more time too.[8]

In this research, active learning is understood as the process through which the individual acquires knowledge, experiences, and skills as a social being who gets involved at different levels. The role of the professor in this kind of learning is that of a mediator, facilitator, revitalizer, and counselor; neither a knowledge emitter nor a performer of master classes.

In terms of learning, active discovery-based learning is prioritized first as students are sought to reorder their concepts and adapt them to their cognitive ways of thinking; second comes experiential learning because, out of their own experiences, the individuals perceive facts in their way, thus learning results from self-reflection.[9]

METHODS

Study design

A mixed research approach combining quantitative and qualitative methods was carried out to assess the efficiency of the learning strategy using the platform Second Life (SL) in the course Financial Tools and Project Assessment (FTPA).

Participants

The participants in this study were university students taking the FTPA course who agreed to participate in this study and had access to the platform Second Life.

Procedure

A learning strategy including the use of the platform Second Life (SL) in the FTPA course was designed. Students received previous training in using this platform and were provided access to it to carry out learning activities related to the course.

There were two evaluation types to assess the learning strategy's efficiency. Firstly, a quantitative questionnaire was applied to evaluate students´ knowledge of the FTPA course before and after using the SL platform. Secondly, semi-structured interviews with the students were conducted to gather qualitative information on their experience using this platform and their perception about its effectiveness in learning in the course.

The resulting data were processed using the programs Excel for the quantitative analysis of the data from the questionnaire and Atlas ti and Ucinet for the qualitative analysis of the interviews.

Data analysis

For the data on the perceptions of virtual lessons both with traditional platforms and in a 3D space, the software UCINET 6.0 was used; this way, the variables were identified, and the symmetric adjacency matrix devised with a single relation of the variables to Traditional Virtual Lesson-TVL, which was crossed with two attribute matrixes: attribute matrix 1. Type of perception; attribute matrix 2. Frequency of the variable; this crossing process resulted in the generation of the network diagram. The same occurred concerning the 3D space.

In the case of the more extensive answers, we worked with the qualitative-data-processing software Atlas TI, version 9.0; for this purpose, the codes were created, the relations between codes were built, and, finally, the network was generated for the wording of the findings.

Ethics

The informed consent of participants was obtained, and the confidentiality of the gathered data was guaranteed at all times. This study was carried out according to the ethical principles established in the Declaration of Helsinki.

RESULTS AND DISCUSSION

Students´ perception

According to Dickey[10], virtual 3D worlds offer pedagogical backup by fostering constructivist learning environments for geographically distant students, as they provide educators with an accessible setting by creating a rich, convincing 3D context making it possible to place learning, communication tools supporting discourse and collaboration, and web integration to provide the information-searching resources and tools at the right time.

The incorporation of the use of virtual 3D platforms into academic practices has aroused growing interest at institutions of higher education. These interaction spaces promote innovation and experimentation and have become new learning strategies through the virtual world. One of these platforms is SL, created by Linden Lab Company, which has raised interest in educational institutions and research groups wishing to use it to create more dynamic and open teaching and learning spaces with more participation of students.[11]

Nevertheless, even though virtual 3D spaces are not a recent creation, they are scarcely known in the academic world. In this study, when students were consulted about their knowledge of this tool, 70 % affirmed they did not know it, while 30 % declared they had little understanding of it (figure 1).

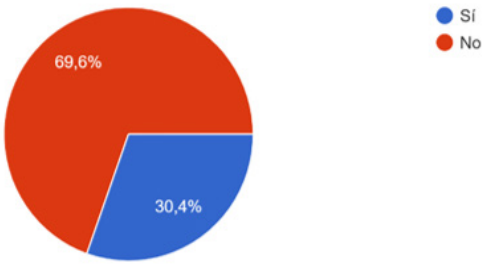

Figure 1. Knowledge of SL

This incredible ignorance coincides with several pieces of research done in the educational community about knowledge of SL. Escobar[12] did a part of the research at La Plata University with students doing a master´s degree course, and 100 % of surveyed students admitted they did not know this platform.

In like manner, Quinche et al.[11] carried out studies at the Engineering Faculty of Minuto de Dios University, where at that time, only 10% of surveyed students affirmed they knew about the existence of SL. Eleven years later, there is still much ignorance despite a year and a half of pandemic in which 100 % of the institutions of higher education have developed their processes remotely and asynchronously.

In today´s world, we speak of the age of information and technology; however, knowledge and management of ICTs by not just a few students are relatively scarce, which does not strengthen their learning processes as expected. According to Ramos et al.[13], this is because students have minimal digital competencies.

Despite the above, in the course of this study, when guiding students in the use of a 3D environment in SL and teaching them it is functioning for the lesson being the object of the exercise, the most frequent opinion about the degree of difficulty to manage the tool and develop the 3D lesson was “low level” (39 % of surveyed students), followed by “middle level” (30,4 %) (figure 2).

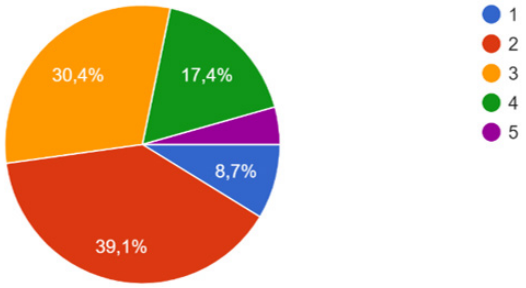

Figure 2. Opinion about the level of difficulty in managing SL

The aforesaid demonstrates that, despite not having excellent skills in managing ICTs, the friendly space and the interactivity of the SL strategy (a 3D space) make the student´s perception of the difficulty in managing to be very low. Therefore, in line with the authors, the technological revolution in teaching and learning does not only have to do with being in the technological vanguard, having last-generation computer rooms or a vast Wi-Fi network. It involves building consistent models based on non-immersive scenarios allowing students to be accompanied in their independent time. SL is an example of a technological tool providing easy access and management and favoring permanent interaction between the student and the object of study.

In the same order of ideas, 96 % of students considered that pedagogical tools in a virtual environment could be used in any academic space and subject of their degree course. In addition, 57 % of them assured that their level of understanding and learning would improve considerably by using a strategy in a virtual 3D environment, followed by 44 % who, though not affirming it definitely, answered “maybe”. This 57 % is ratified when 61 % of students chose the 3D mediation instead of the traditional virtual mediation for a lesson, while 35 % preferred to learn more about the tool.

Students´ imaginaries about virtual lessons and/or academic spaces by traditional platforms

Figure 3 shows 11 perceptions expressed by students about what virtual traditional-platform-aided lessons generate in them. These perceptions were typified as pedagogical-orange color-, related to “reading and listening”, “monotony”, “pedagogically unsound”, “misunderstanding,” and “without interaction”; attitudinal-blue color, “tediousness”; “boredom”, “laziness”, “disinterest” and technologies-fuchsia color-, “poor connectivity”. This being the case, the most significant number of perceptions were pedagogical and attitudinal; within them, the most frequent were attitudinal-boredom and pedagogical-without interaction. The latter generated the former.

In this figure, the perceptions were graphed by colors –a type of perception- and by size, the most significant charts being the most frequent expressions and the smallest ones being the less reiterative.

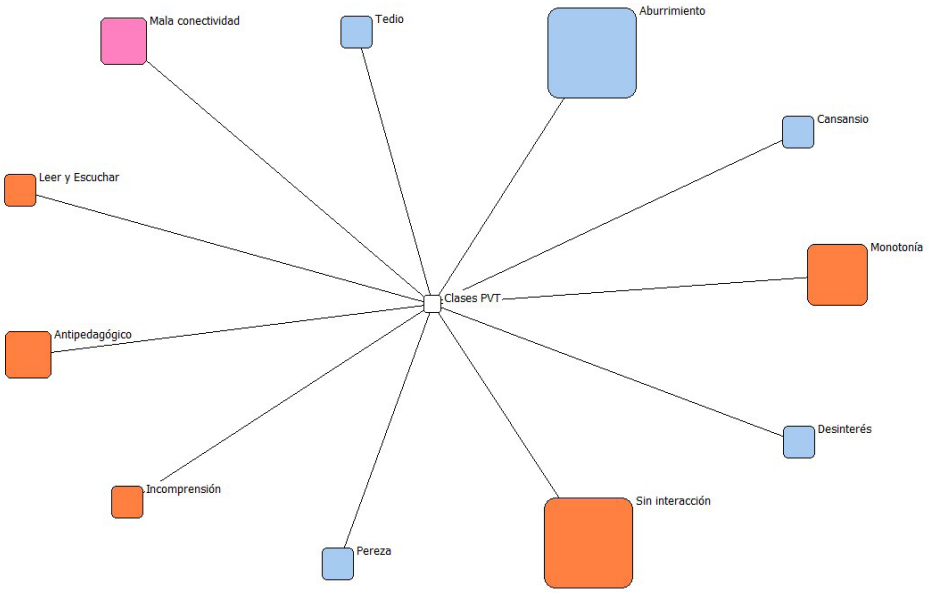

Figure 3. Students´ perceptions of the lessons through virtual mediations and traditional platforms

Authors state that attitude bears a close relation to the skepticism shown by both students and professors when they have mentioned the incorporation of ICTs into the teaching-learning processes, especially if it is the

numeric areas of knowledge, i.e., mathematics, finances, economics, and accountancy.[14,15,16]

This could be because these areas of knowledge have a higher level of abstraction, which makes the process more incomprehensible; therefore, previous knowledge of both the subjects and the use of the ICT tools is needed. The above is so that adopting the new strategies does not fail.

According to Hart[17] attitude is an evaluative predisposition that can be positive or negative and impinges directly on the behavior of the human being. Attitudes, adds this author, appear around three components: the cognitive, referring to beliefs, expectations, and preferences; the affective having to do with feelings, emotions, and states of mind; and, finally, the behavioral, relating to conducts and intentions to act.

In line with the aforesaid, Araujo et al.[18] state that attitude is a disposition to accept or reject ICTs based on the cognitive, the affective, and the behavioral, which spring from the relation and direct contact between the student, the professor and within the same institution of Higher Education that uses the technology. Therefore, not-for-nothing students expressed that lessons via traditional technological platforms generate boredom, laziness, tediousness, and affective and behavioral expressions. Likewise, misunderstanding, monotony, and few clarities refer to the cognitive.

Words related to virtual lessons in the 3D SL environment

The tool having been applied, students were consulted about their opinion on virtual 3D-SL-environment-aided lessons; they expressed perceptions of the attitudinal-blue type such as: “interesting”, “modern”, ”entertaining”, “novel”, “exciting”, “new”, “great”, “curious” and “amusing”.

According to Gaete[19] precisely SL spaces allow the development of more excellent attitudinal competencies; in the words of Méndez (2014), SL is a platform providing virtual spaces as a complement to school environments; in it, you do not only create but also share knowledge through a community offering creativeness, interaction, imagination, and immersion by way of practical exercises and collaborative work. Furthermore, this space increases motivation and interest in teaching and learning.[20]

Besides, students mentioned expressions showing an enriching interaction not only regarding knowledge but also in the personal and the human senses; perceptions of the pedagogical-brown type such as “learning”, “practical”, “dynamic”, “improvement”, and “games”.

Concerning the technological aspect -in fuchsia color (4)- the categories were: “technology,””lively,” “interaction,” and “innovation” (Figure 4).

Interaction, the capacity, and the opportunity to be in a more open and flexible space with different communication channels, such as chats and microphones, make the exercise more dynamic.[21] In the same order, the concept of innovation, knowing cultures, practicing another language, and participating in working groups collaboratively, is what Henderson[22] called physical and linguistic correspondence.

The most frequent perceptions were attitudinal, followed by the methodological, and finally the technological, and the strongest categories were “interaction”, “innovation,” and “learning.” This being the case, it is interesting that the technological categories, though fewest in number, were the strongest and more convincing. Students consider that virtual lessons through a 3D platform offer more “interaction” and are an “innovative” issue allowing better development of skills.

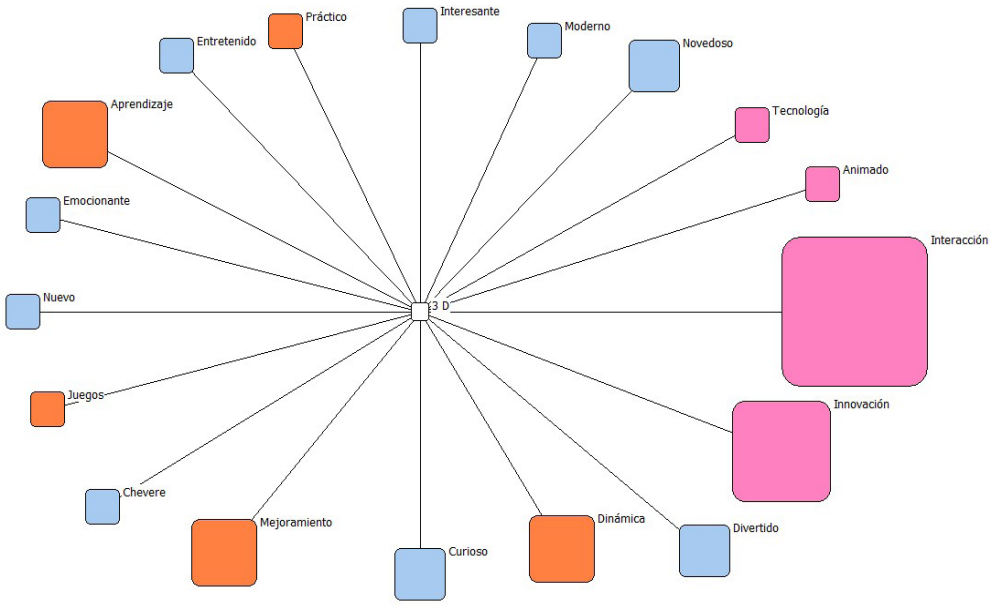

Figure 4. Students´ perceptions of the 3D SL experience

Difficult situations to develop a lesson in a virtual 3D environment?

Several authors have researched the limitations of using SL as a virtual 3D environment for teaching and learning. The problems concerning technology, identity, culture, collaboration, time, associated costs, normalization standards, the persistence of the traditional framework, and social discovery are factors hindering the generalization of the use of SL.

According to Dalgarno et al.[23] barriers are perceptual (like the idea that the virtual world is only for games), technical (like the bandwidth and memory), operational, and pedagogical (like technology assessment).

In line with the authors, after consulting the students, it was found that the main limitations in using the virtual 3D environment are accessibility and availability of tools and equipment. Firstly, most students expressed concern for the quality of the Internet afforded them in terms of the efficiency of the connectivity and the bandwidth available to them. Besides, their concerns revolved around the fact that the tools and computer equipment available do not have enough memory space and speed for a 3D environment (see figure 5).

These identified perceptions coincide with what was put forth by Acosta et al.[24] and Escobar et al.[25] who mention that, for optimal use of this platform, having access to an excellent internet connection is required; furthermore, the computers used with it must have good processing capacity and speed. Together with the above, in the personal-human aspect, the consulted students expressed they have "scarce management" of the tool due to their "ignorance" of it and the "traditionality" their lessons have been oriented with.

Acosta et al.[24] consider that controlling the avatar is initially a little complicated and, as with any technological process, students need competencies to work on their own, previous training in SL, and build the so-called SL culture.

Likewise, there is the issue of "backup" mentioned by students because of their uncertainty about the speed and functionality of the virtual space when there are many avatars participating simultaneously. In line with the aforesaid, Acosta et al.[24] affirm that SL slows down very much when there are around 3 000 avatars connected, and the application may close, and thus the work already done is lost.

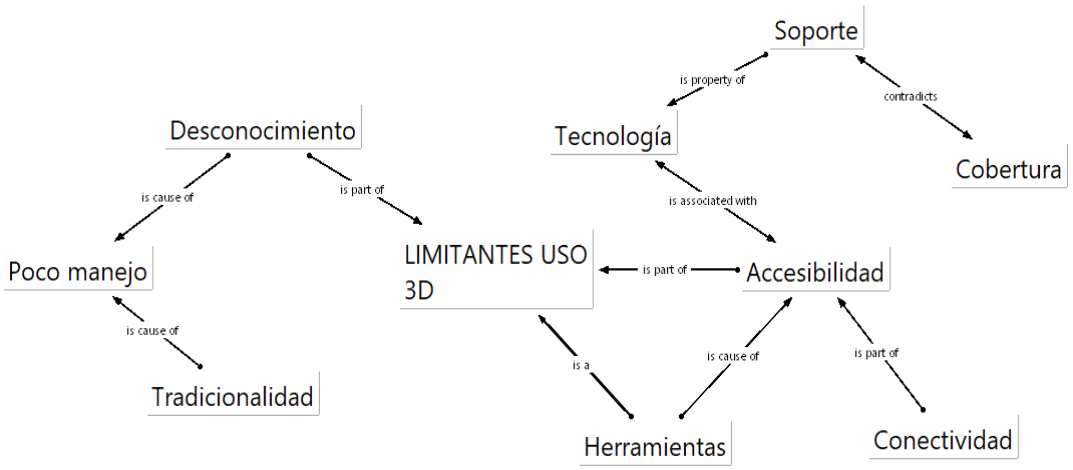

Figure 5. Network limitations in using 3D

FINAL CONSIDERATIONS

Every time students wish to have more autonomy in their learning, to be more independent and active in building their knowledge, they feel the need to make and discover things on their own, to work out thematic, didactic, theoretical, or practical problems based on their previous knowledge.[26]

Some of the advantages of active learning are a better understanding of subjects, increased participation in class, enriched knowledge based on the contributions made by classmates, students feeling more comfortable raising their doubts and ideas; attention focuses on strengthening competencies, where those who learn are aware of their commitment to society.[27]

Collaborative work is a generator of skills, experiences, and knowledge favoring the construction of quick, flexible, innovative answers to the needs of today´s world.

Active learning is a fundamental support in the educational process, where generic competencies are determinant to prepare the student based on the demands of current society. Well now, to be able to develop individual competencies – within them are the skill of people to decide, control emotions, respect for and recognition of the others – as well as the social competencies that are the foundation of the development of the human being – within them are communication and teamwork – active-learning-based training is required.

Then, it is important to make students improve not only their knowledge but its translation into action as

well; the following are some of the competencies that could be systematized:

- Be able to work out problems in a context out of the integration of knowing how to be;
- Knowing how to know, understood as learning concepts and theories;
- Knowing how to make obtained out of procedural and technical skills. Learning to make from teamwork and supported by social interaction; learning to live together within the framework of coexistence and peace;
- Based on the individual's personal development, autonomy and responsibility, they are learning to integrate the mental processes and the construction of knowledge.

This study demonstrated that by using SL in the academic space of Financial Tools and Project Assessment, students could acquire knowledge and learn concepts more efficiently. The practical exercises were more precise and accurate, improving analysis and understanding.

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