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How virtual learning environments transform learning scenarios

Cómo los entornos virtuales de aprendizaje transforman los ambientes de aprendizaje

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Abstract

Technology integration in the classroom is an ongoing process where students and teachers modify their interaction and roles. In this integration, technological devices and virtual resources are used to achieve better educational purposes and enhance its processes. Additionally, through technology integration different skills needed in this century can be actually developed. Nowadays, teachers are implementing virtual scenarios in function of the learning process, like an option to integrate traditional education with progressive technology that society has used to impulse social, economic and cultural relations. This strategy has shown a variety of benefits in educational environments; however, it has been garbled by social and curricular barriers that limit the benefits of the use technology in education. This article includes some factors that make technology integration a way to revitalize traditional education, it also mentions why this integration is a successful strategy to improve the teaching and learning processes, to generate new knowledge and to enrich existent information.

Keywords: Competences; Asynchronous interaction; Synchronous interaction; Technological integration; Virtual learning environment; Virtual learning object.

Resumen

La mediación tecnológica en el aula de clase es un proceso continuo que permite que estudiantes y profesores modifiquen sus interacciones y roles. En la mediación tecnológica, los dispositivos tecnológicos y los recursos digitales se usan para alcanzar objetivos educativos y mejorar sus procesos. Adicionalmente, a través de la mediación tecnológica pueden desarrollarse muchas habilidades necesarias en este siglo. Actualmente, los docentes están implementando entornos virtuales en función del proceso de aprendizaje, como una opción para integrar la educación tradicional con la tecnología progresiva que la sociedad ha usado para impulsar relaciones sociales, económicas y culturales. Esta estrategia ha mostrado una variedad de beneficios en ambientes educativos; sin embargo, se ha visto truncado por barreras sociales y curriculares que limitan los beneficios del uso de la tecnología en la educación. Este artículo incluye algunos factores que hacen de la mediación tecnológica una manera de revitalizar la educación tradicional, además menciona por qué esta integración es una exitosa estrategia para mejorar los procesos de enseñanza y de aprendizaje, generar nuevo conocimiento y enriquecer la información existente.

Palabras clave: Competencias; Interacción asincrónica; Interacción sincrónica; Mediación tecnológica; Entorno virtual; Objeto virtual de aprendizaje.

Introduction

Technology has become indispensable in people's life; it has been part of the multidimensional evolution of mankind. For a long time, technology was implemented in education just as a tool to achieve goals; however, today it is known that technology is more than a simple object. Taking into account the impact that technology has had in society, it is evident that technology has provoked changes in many disciplines, sciences and occupations. This is the case of technology applied to educational purposes or technology integration. Morton (1996) refers that "the concept of "computer as tool" misleads educational planners and relegates computer technology to the level of "supplies"--pencils, paper, pens, and paper clips. Technology integration is not simply seeing the computer as a tool" (p. 77). He argues that using this view promotes the notion of the "computer as add-on." In other words, computer technology is not just an implementation or the use of devices with isolated purposes; "it is Seamless manner to support and extend curriculum objectives and to engage students in meaningful learning" (Dias, 1999, p. 11).

Additionally, "Technology integration as the incorporation of technology resources and technology-based practices into the daily routines, work, and management of schools" (National Center for Education Statistics, 2002, p. 75). In this aspect, technology integration can enrich educational purposes without forgetting the authenticity of real life in classrooms. Learners develop skills which are applied in real life situations; for instance, independency, creativity and critical and strategic thinking. On other hand, teachers change the traditional way to do and perceive their jobs, implementing strategies to engage students in education through new methods to see curricular information, making their labor more efficient.

In that perspective, teachers have included little by little to their discourse that virtual environments can help students by learning through meaningful experiences, they can become independent learners and center of the learning process; also, "students socially construct knowledge, which requires meaningful, open-ended, challenging problems for the learner to solve" like Fox (2010) expresses in his constructivist perspective. Therefore, combining traditional face to face education with virtual learning environments makes sense that technology integration through virtual environments promotes and enriches the teaching and learning processes based on constructivist practices.

In addition, in order to integrate technology successfully teachers should have both "media literacy" and "media information literacy". Although both concepts are closely related they are not the same. That is to say that both concepts share similarities and differences. On the one hand, according to Lee (2010); NAMLE (cited in Lee & So 2014), media literacy refers to a set of communication competences which include skills to access, analyze, evaluate, and communicate information in different ways (p. 138). On the other hand, according to Catts & Lau (2008) cited in Lee & So (2014) information literacy is:

the ability of an individual to 1) recognize their information needs; 2) locate and evaluate the quality of information; 3) store and retrieve information; 4) make effective and ethical use of information; 5) apply information to create and communicate knowledge (p. 138).

These two concepts seem to be from a different field but they share the similarity of aiming to cultivate people's ability to access, understand, use and create media messages or information, qualities which teachers who aim to integrate technology must have.

On the other hand, taking a more general view, Castells (1995) expresses that “a technological revolution with historic proportions is transforming the fundamental dimension of human life: time and space” (p. 1). Therefore, there are many ways in which technology integration contributes to enriching teaching and learning process in the classroom. Environments which integrate technology take into account socio-cultural aspects and cross new trends in the digital world in order to maximize students’ opportunities to achieve meaningful learning in which teacher acts as a facilitator. This is a process where roles, understandings, perceptions and interactions change, it moves teachers from the traditional face to face methods to an environment in which those methods are energized and updated to transform common topics into more active ones.

Types of interactions in a virtual learning environment

Virtual learning environments are characterized, among other elements, by devices and applications oriented to make communication possible among students and between teachers and students. According to Algahtani (cited in Arkorful and Abaidoo 2015) completely online interactions in a virtual learning environment might be synchronous or asynchronous (p. 31). Synchronous communication devices include chats and MUDs (Multi User Domains) while asynchronous devices make use of electronic mail and forums. Those virtual spaces promote the social interaction which in this case is virtual, where people can share their opinions and insights. Even just posting virtual learning objects promotes social interaction, since they provoke opinions by participants in the virtual community. Those interactions may also be “one-to-one, one-to-many or many-to-many”.

Those types of interactions (Asynchronous or synchronous) have advantages and disadvantages, thus, one could not be qualified as better than the other. They are just different and used depending on the necessities teachers have in the moment; the type of lesson the teacher has in mind.

According to different studies, synchronous interactions in the virtual learning environment allow teachers and students immediate interaction creating a sense of community; besides, students feel more motivation towards e-learning in general when they feel they interact with others in real time; in addition to that, by using synchronous interactions in the classroom the students have the opportunity of instant feedback from both teacher and classmates. That is possible because of the nature of synchronous interactions which are closer to face to face interactions (Hrastiski, 2008) since they occur in real time.

Although synchronous interactions are more motivating for students because they happen in real time -having instant answers from the receiver of the message-, this can turn into a disadvantage if analyzed from another perspective. As the receiver is engaged in real time communication, the answer should be instant too, and there is not much time for insights from the students. Interactions are more spontaneous but less reflective, since ideas tend not to be set properly. Furthermore, the cost in synchronous interactions is higher than in the asynchronous ones, because they require high speed internet connection, which is not available in all of the teaching scenarios in our country.

In terms of the advantages of asynchronous communication, we find the possibility to reflect on learning. There is time for insight and for setting ideas clearly and properly, since these interactions do not occur in real time. Another advantage is the possibility to use E-portfolios. In this strategy, students can

record their work and also the feedback given by classmates and teachers. The use of E-portfolios is highly positive since “e-portfolios are helping students become critical thinkers and aiding in the development of their writing and multimedia communication skills. E-portfolios can help students learn information and technology literacy skills and how to use digital media” Lorenzo and Ittelson (2005).

As we can see, both types of interactions: synchronous and asynchronous, are very advantageous in virtual learning environments. Even if the advantage of one is the disadvantage of the other. Thus, the best alternative would be to use both, since they complement each other. In the synchronous ones, the interaction in real time is favored, and students with high social skills are favored, and in the asynchronous ones there is more time to reflect and develop ideas. Therefore, reflective students are favored in this type of interactions. By combining both: synchronous and asynchronous communication, teachers can include all the type of students that are in the classroom.

Students: actors in virtual learning environments.

Nowadays, teachers aim at teaching their pupils in meaningful ways. They want students to become the center of the learning process. There are many ways to achieve that goal and one of them is by designing a virtual learning environment, where the students change from the role of information receivers to information manipulators. In other words, they become actors of the learning process, having the main role during the learning experiences.

In virtual learning environments, “students are not only active, but also actors. They co-construct the virtual space” Dillenbourg, Schneyder & Syneta, (2002), because in a virtual learning environment, the student`s role is not restricted to web information consumers, but, the student is also the one who produces information, which cannot just be shared with his/her educational community but with a world virtual community. The role of both: students and teacher is transformed. The teacher does not control learning, but creates the environment for students to explore. That is why he must be careful in selecting and designing the learning scenario which could be presented as a Webquest, a blog or an infography, among others.

The challenge is to change perceptions and roles in learning. The teacher has to relegate his control in the classroom since he cannot manage learning. But his role becomes critical, since the teacher is the one who designs the appropriate virtual scenario and turns into a facilitator or tutor. The challenge for the student is to be responsible of his own learning, becoming more independent, and of developing problem solving skills. Students also become explorers of the learning scenario, because the teacher is not modeling the access to information or solving problematic situations the learner may encounter.

Teacher and students' roles are transformed

In order to differentiate a virtual learning environment with a normal face to face learning environment, we could point out the role of both students and teacher. In a face to face learning environment, the teacher can control learning if desired, therefore, the students are to some extent dependent from teachers. Contrary

to face to face learning environments in a virtual scenario learning cannot be controlled or at least not fully controlled. The role for teachers is to design a proper virtual environment for students to explore, the rest of the process is students' responsibility raising autonomy in students, being the students the ones who solve the problems without the necessity of a teacher the whole time.

In a virtual learning scenario, the roles of both: students and teachers change. The teacher does not hold full control of the classroom. Actually, there is no control in the learning environment, as students access virtual learning objects based on their own interests and motivations and not lead by the teacher. Teachers must necessarily take that into account when they integrate technology in the classroom. Virtual learning scenarios must have a non-linear structure that allow students to randomly access information and develop tasks that help them develop the necessary competences of a given subject. Their role is that of designers, facilitators and tutors in the learning scenario. That is why, teachers have to be literate and trained in integrating technology and designing meaningful tasks and learning scenarios appropriate for students.

In regards to students' role, it is transformed from a passive receiver of information into an explorer and manipulator of information. Therefore, the student should comprehend information and create from there new ideas. Activities in a virtual learning scenario can include, writing different formal text types, establishing opinions in forums, developing a task proposed by the teacher in a webquest, among others. All those activities or tasks can be read by the teacher but also by a virtual community and promote discussion and construction of knowledge.

This change of roles is also challenging, since the teacher and the student is required to get out of the comfort zone. Changing roles in a virtual learning environment requires from the teacher to create and design virtual learning objects, activities and tasks, something which is not easily done – even if the tools available for that are pretty intuitive- and requires time. Therefore, teachers must be committed in order to integrate technology successfully. In regards to students, it is easier to depend on the teachers' answers and guidance all the time. It is not easy to change, but, it is up to the teacher to persuade students to change their mind and make them aware that they can be independent and learn on their own.

Development of the 21st century skills

Currently, students are required some skills and knowledge which are basic “to succeed in work, life and citizenship, as well as the support systems necessary for 21st century learning outcomes” (Partnership for 21st century learning, 2016), some of those skills are widely connected with technology skills and literacy, for instance: “Learning and Innovation Skills” and “Information, Media and Technology Skills”. In learning innovations skills, students should develop creativity and innovation, critical thinking and problem solving, communication and collaboration. On the other hand, in information media and technology skills students should be information literate, media literate and ICT literate. Besides, students should develop critical thinking, problem-solving skills and autonomy. In that sense, the integration of technology in the classrooms can help students acquire those skills, thus, it is a teachers' must to prepare new generations of students to face the new challenges that they may face in the real life. Education should be focused on the reality and not just in the academy.

Students in virtual learning environments are required to create and innovate. They do not just receive information but transform it, creating and innovating. In order to create, they should work cooperatively and be open to other people's ideas. That is why, by promoting and using virtual learning environments; social skills, creativity and innovation are fostered. It is not easy, but the integration of technology in the classroom is a step forward to achieve those goals.

In addition, by integrating technology, students are becoming ICT literates, since they are capable to use ICT tools "to research, organize, evaluate and communicate information" (Partnership for 21st century learning, 2016, p. 5), but also to make judgments about them. Students can evaluate the quality and reliability of the information and use it appropriately; besides being aware of the ethical issues as plagiarism and the importance of copyright in order to value somebody else's work as well as their work.

Furthermore, when there is technology integration, students become media literate. Students understand how messages are constructed and for what purposes; taking into account how other people perceive the messages, following some netiquette and cultural rules -since in internet there are also rules and social conventions to follow- having access to new cultures, becoming more open to others' points of view and having a sociolinguistic impact.

Another skill which is developed in virtual learning environments is being information literate. As it was already mentioned, students are not just information receivers but they have to search for and receive information which is going to be processed, comprehended and interpreted by them. They are not restricted to consuming information. Thus, students become capable of managing information efficiently but also effectively. They become able to make judgments about the reliability of information they search for. The Internet has a lot of information and even if much of it is useful and arbitrated, much of that information is useless, what makes quite important for students become information literate. In a more general point of view, Castells (1995) mentions that:

the promise of the information technology supposes that it opens unlimited horizon for creativity and communication, inviting us to the exploration of new fields of experience, since our own inside being, until the external universe, challenging our society to involve us in a process of structural changes (p. 1).

With technology integration, teachers can also implement collaborative work strategies, where the web 2.0 plays a very important role. Since its use requires students to create and share content in new ways and real time:

learners' familiarity with web 2.0 technologies opens up a new space for and style of learning. This new style of learning focuses on collaborative knowledge building, shared assets, problem solving, and the breakdown of distinctions between knowledge and communication (Pacific Policy Research Center, 2010, p. 10)

Finally, a virtual learning environment promotes autonomy, problem solving and critical thinking skills in students. The purpose of education is not just to transmit information from teachers to students, but for students to learn how to learn without the necessity of always having a teacher next to them. In virtual learning environments, the student is the one who has to explore the learning environment and solve problems if it is necessary. In order to solve problems, the students should develop problem-solving skills - another of the 21st century skills- and accomplishing the tasks by himself, becoming independent and autonomous. These problem solving skills "include the ability of individuals to a) reason effectively, b) ask pointed questions and solve problems, c) analyze and evaluate alternative points of view, and d) reflect

critically on decisions and processes” besides, developing critical thinking in students, defined by Trilling and Fadel cited in Pacific Policy Research Center (2009) as “the ability to analyze, interpret, evaluate, summarize, and synthesize information”(p. 7) required when a student is going to manipulate, create and share information in learning environments.

The importance of integrating technology in the classroom is critical in order to acquire the 21st century skills, Skills that students are going to need in academic, social and professional life. It is the teachers’ job to help students acquire the skills they need to face the upcoming challenges. Then, technology in the classrooms, if integrated properly, becomes mandatory and not an option. The problems are the constraints found when trying to integrate technology in the classrooms which can derive from resources available but also from lack of training and commitment from teachers and students.

Conclusion

To conclude, surprisingly, even after exploring the advantages and the importance of technology integration nowadays, there is a variety of barriers which inhibits the use of technology beyond its utilitarian perspective or just its simple use. In some of the cases, difficulties come from government agencies, since the resources and training to teachers required for using the devices are not always available in the cases where some equipment is provided. This can be caused by the costs derived from the acquisition of new technologies or professional development. In some other cases, the difficulties arise from lack of commitment by teachers, administrators or both. Sometimes the administrators, in this case: principals, are not interested in the integration of technology, therefore they do not open the space for training while in the case of teachers, some are not willing to change or are not prepared to do so because of lack of training. Now, knowing all the advantages which the technology integration can bring, the challenge is how to overcome the barriers in integrating new technologies. The barriers are there, now, the next step is to approach those barriers in order to enhance learning environments.

Also, teachers should know that, “technology integration, increases the scientific information exchange, the access to vary new linguistic and cultural content; thus the development of democracy, dialogue and participation in classroom”. (Ministerio de Educación Nacional, 2013, pp. 18-19). Therefore, social skills, the understanding of other people’s ideas and awareness about the otherness are fostered, by having access to other cultures and perceptions of the world.

As it stated in this text, students and teachers should change roles. Teachers should become facilitators and help students to succeed in the academic, social and professional fields, but it is possible if students are aware that they are responsible for their own learning too. Students and teachers should work cooperatively in order to accomplish the best results. If one of the pieces in the teaching and learning processes is not working properly, results are not going to be the expected ones.

Conflict of interest:

The authors declare the inexistence of a conflict of interest with institution or commercial association of any kind.

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