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IMMERSIVE TECHNOLOGY IN HIGHER EDUCATION

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Abstract: *Introduction*: This review article establishes the importance of immersive technologies in education as a tool that helps efficiently develop academic activities, with the objective of identifying digital technologies for teaching higher education. Background: For this purpose and as the type of article indicates, a bibliographic review is carried out based on a documentary research methodology, maintaining the "freshness" of the references consulted, as well as the work ethics by maintaining the guidelines of the APA reference format in its seventh edition. Discussion: Based on the references studied, 2 technologies related to immersive technologies for education are identified, these being augmented reality (AR) and virtual reality (VR).
Keywords: education development; new technologies; innovation; educational technology.

INTRODUCTION

In the words of García and Ruiz (2020), it is more human to talk about technology than it seems to be. Therefore, a great challenge, both technical and educational, is to humanize the digital learning context. Because all types of digital tools were developed and invented, the skills and knowledge had to be acquired to be able to develop in new environments and solve their needs, followed by paying attention to their academic curiosity, offering options to satisfy said needs, solve new problems or open new paradigms. One of the main activities of higher education is research, development and constant improvement of education, the latter has made great progress in the last decade, facilitated by the technological advances that are being implemented in various educational institutions.

As mentioned by Paredes, et al. (2020) develop actions to overcome the barriers that affect the higher education ecosystem and the sustainability of demand in Latin America, leads us to review higher education and research in Latin America and moving towards the use of digital technologies, the which was recently accelerated due to the now-past COVID-19 pandemic. Added to this is the fact that the development of digital technology, together with information and communication technology, has become one of the key technologies that are most in demand by the knowledge society. Briceño, et al. (2020) mentions that the focus of the knowledge society is on measuring results and information technology, the management of digital technology in support of distance learning. Used to reduce the risks involved in training management and to maintain the research process in any context that arises, a clear example is the context of an unprecedented health crisis such as the 2020-2021 pandemic, which leads to a transition from scarcity to greater use of digital technologies, to reduce the potential effects of academic and research paralysis in higher education institutions. A common indicator of the nature and impact of the use of digital technologies and the central platforms and infrastructures of content providers that support synchronous and asynchronous processes in higher education, becomes a competitive factor by guaranteeing connectivity regardless of the context, as well as offering various benefits. Thus, the main problem to be addressed in this article is the lack of identification of digital technologies that can be applied in higher education.

For this, there are some precedents at the international level: Pozos and Tejada (2018) aimed to identify digital competencies in higher education teachers. The methodology was a quantitative-qualitative (mixed) approach. The sample taken for this study was 247 teachers, to whom a questionnaire and interview was applied to measure the degree of mastery of digital skills. The results

of their study show a medium-low mastery of digital skills in relation to information and communication technologies (ICT). Basso, et al. (2018) in their study aimed to make a proposal for the use of ICT in the context of education, thus proposing the application of the flipped classroom. The study was of an exploratory type, in which through a bibliographic review they propose an educational model from which they conclude the possible advantages that its application can bring, denoting that it is thanks to the use of digital technologies. Ayala, et al. (2020) had the objective of their study to identify immersive technologies as an alternative for learning. For which through a qualitative approach methodology of phenomenological design and through an observation guide as a tool for collecting information. Among the results and conclusions, the author concludes that immersive technologies have the necessary benefits to serve as an alternative of educational tools and media for optimal learning.

The objective of this article is to identify digital technologies for teaching higher education.

The methodology used is documentary research, which in the words of Jiménez (2020) is defined, in a first stage, as a set of methods and techniques to find, process and store information contained in documents from reliable and systematic sources, consistent and with enough experience to present new information in scientific documents, as a second instance. Do not understand or dismiss document research as simply searching for documents related to a topic.

ANTECEDENTES

The references to be taken into consideration as background information fit within certain subtopics which are listed below:

DIGITAL TECHNOLOGIES IN HIGHER EDUCATION

As García and Ruiz (2020) pointed out, when we talk about the use of advanced digital technologies in the educational process, we cannot ignore the development of humanity in this aspect. Regarding the role of digital technology, De Pablos (2018) mentions that digital technologies such as ICT must be based on the basis that they were not created to improve the educational process but the purpose that teachers have for these tools and environments goes beyond the social and economic activities for which they were created, given that these tools have great potential in education. That is why it is important to adapt them to the educational context; when making adjustments from the perspective of the students, teachers and administrators of the institution in which it is implemented. This is how we talk about virtual campus and immersive learning which, initially, are platforms designed to manage educational services and communication between students and teachers. Subsequently, they were adapted to the teaching and learning needs.

Therefore, digital technologies have been considered strategic resources for the management and improvement of education and learning in recent decades. Compte and Sánchez (2019) mention that digital technologies, among other things, help to improve the management of higher education and, more importantly, help to improve teaching in higher education institutions. It is important that the educational institution supports the operation of these resources, higher education environments and research processes, part of the academic transition by updating educational methods, with educational goals that are designed to cover any inconveniences that may occur.

According to Kohls (2021), the

configuration in which teachers implement these digital technologies can determine their educational use. Teachers' perceptions and beliefs about the use of educational technology directly affect the design and its planning.

Thus, for the correct management of technology in education, the necessary skills are required and these are called digital skills which, in the words of Padilla, et al. (2019), allow you to take advantage of the great possibilities associated with digital technologies, as well as solve the challenges they pose. Thus, digital educational resources are within the reach of both students and teachers and the necessary management of them is due to digital skills, which has caused a greater number of educational institutions to promote them as support materials in their courses. giving teachers the freedom to use these technologies that allow for exploratory learning, thus teachers must also have the creativity necessary to handle digital technologies.

CREATIVITY OF EXPLORATORY LEARNING

Álvarez et al. (2019) emphasized the importance of using innovative ideas in education so that education changes and adapts to new technologies. Therefore, education must be encouraged to be creative and innovative, to increase the spirit of innovation. Education for all students is the formation of the pedagogical process of comprehensive and quality education. At the same time, innovation and teaching are pedagogical tools that are part of the exploratory learning methodology modified to immersive technologies.

In relation to the above, Latorre, et al. (2020) mentions that it is in exploratory learning where teachers invite students to social reality to understand, know and discover the needs of individuals and groups in that context through the creativity that the students themselves express to provide a solution. to these needs, through a process. Regarding this process, Melero, et al. (2020) mentions how the needs and groups or individuals to whom exploratory learning must be applied are identified, this way it works as a phase which ends with the presentation of the challenge to be solved. By challenge we mean stimulus, challenge, opportunity.

Therefore, in the words of Peña (2019), creativity in exploratory learning is finding different and effective solutions. The teacher encourages students to be creative in creating suggestions or options. These ideas are evaluated together with peers for their relevance and effectiveness. Finally, the best way to do and solve the challenge in question is specified. For their part, Durán and Rosado (2020) affirm that the results of creativity in exploratory learning are aimed at creating and developing technological resources or tools important for the development of society, given that creativity is based on the use of a collaborative methodology, motivation and promotion of new experiences to formulate new proposals, all so that students become free subjects in the discovery and improvement of the capacity for creation, but for this not only creativity but also the technological skills necessary to generate the capacity for creation, production and learning efficiently.

LEARNING THROUGH TECHNOLOGICAL COMPETENCIES

Regarding digital competencies, Vargas (2019) and Cedeño (2019) mention that they are those abilities and/or skills that the university professor develops in his teaching work and the student in his learning process, in such a way that they can adapt to ICTs. which are constantly changing, generating various new digital tools and even immersive environments, such as digital platforms,

focused on solving various problems and paradigms that may arise in various areas. As Yaxón (2020) identifies in his research, the degree of applicability and ability to integrate digital skills into the desired field will depend entirely on the mastery of them, and at the same time the management of these skills is crucial in the new educational methodologies that seek to be integrated into higher level educational institutions.

Added to the above, Sandí and Sanz (2018) define technological competencies as a set of knowledge, as well as capabilities and/or skills that teachers must acquire and develop in order to give optimal use and integration to technological resources, being able to this way to improve their pedagogical practice. For their part, Cifuentes and Crespo (2019) add that every teacher today must have competent technological management within their activities and pedagogical practices in such a way that they can make use of ICT in the various academic processes in which they participate. these being generally the teaching-learning processes.

This in turn agrees with those presented by Melo, et al. (2018) who adds that technological competencies may only be basic in terms of the management of technology, however, this must change when it comes to the pedagogical context where teachers are required to have good management of technological competencies such as: processing text, searching and processing information, virtual collaboration, among others.

PROBLEM SOLVING SKILLS IN VIRTUAL ENVIRONMENTS

When it comes to problem-solving skills in virtual environments there are several possibilities that can be considered. Design thinking which, in the words of Aparicio and Ostos (2021), is a problem-solving skill that consists of a set of phases, each phase is a new possibility of learning based on creativity and reflection.

For their part, Suárez, et al. (2019) mentions that one of the skills for solving problems in virtual environments is critical thinking through which students and teachers look for alternatives to quick answers that may not always be the desired answer, being able to reflect objectively. for his actions.

Zuña, et al. (2020) mentions that it is collaborative learning that allows a rapid form of problem solving regardless of the environment where one is working. This skill is more of a social practice which allows us to take into consideration the rest of the participants and together reach a possible solution. solution supporting each other.

AUGMENTED REALITY IN HIGHER EDUCATION

In general, Martínez, et al. (2021) defines augmented reality (AR) as that technology that allows you to interact in a real space with virtual elements, so the technology would be complementing reality without becoming a substitute for it.

This technology, according to Berumen, et al. (2021), consists of three parts, in order: 1) the combination of real and virtual in the same environment. 2) It updates in real time and is also interactive. 3) All data is recorded in 3D allowing constant mapping of the situation and giving the necessary visibility to the user.

The way to use it in pre-university teaching is as an interactive and visual aid tool, given that, in the words of Astudillo (2019), at certain moments of teaching-learning, students need to be able to visualize various angles and even manipulate models. three-dimensional images and even interact with them, being that AR shows its greatest virtues in these cases. Reaffirming the above, Montenegro and Fernández (2022) add that the fact of being able to simulate an immersive virtual environment

is that it manages to solve the problem of manipulating 3D models in a didactic way, thus adding additional information that allows for a better understanding. Of the situation, it must be noted that for AR to be effective, the necessary technology (equipment) is required for processing and to be able to capture the real world in real time (or as close to it).

IMMERSIVE REALITY EDUCATIONAL PLATFORMS

In a similar way to AR, which, as could be intuited from the previous paragraphs, is a technology that serves as an immersive platform that has notable applications in education, there is also its counterpart called immersive virtual reality (VR) in which you can experiment in a completely simulated (programmed) three-dimensional space for precise functions that can go beyond the limitations that real space may have, thus serving as an immersive platform. Some examples of AR and VR as immersive educational platforms, mentioned by Machado (2019), are: ClassVR, although its name is counterintuitive, makes use of AR to be able to recreate a classroom in any environment together with its classmates, thus allowing way to interact in a more realistic way regardless of where they are; Google Cardboard, this example is one developed by Google which works with VR technology allowing students who have a mid/high range device to use VR technology for educational purposes.

Toca and Carrillo (2019) mention three more examples of platforms that, through AR and VR technologies, allow teachers and students to generate their own AR and VR spaces in such a way that classes are more interactive. These platforms are : TLE TeachLivE and OpenSimulator.

The entire theoretical and empirical contribution of the original sources is oriented: it may include subsections as subtitles in accordance with the APA format. The text must be justified and written double-spaced (2.0 line spacing), Times New Roman font, 12 points.

DISCUSSION

From this article it is concluded, with respect to the stated objective, that immersive technologies are already being applied in higher education, through AR and VR technologies which, as previously mentioned, are highly didactic and depending on the educational platform. Its cost is not so high that it is used. Thus allowing teachers and students to already fully enjoy the benefits of immersive technologies. However, this type of technology is not implemented throughout the world for various reasons which can range from lack of budget to lack of interest in innovation for better educational quality.

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