

Virtual education and virtual

learning environments for university students in times of the Covid-19 pandemic


Educación virtual y entornos virtuales de aprendizaje para universitarios en tiempos de la pandemia del Covid-19

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Received: 07/26/2021 Accepted: 10/15/2022 Published: 10/25/2022 DOI: <https://doi.org/10.5281/zenodo.7514041>

Abstract

The dynamics of all social, economic, trade, health, transportation, hotel, etc. activities. that were developed in all the societies of the world, have had to be reformulated due to the Covid-19 Pandemic. Social distancing, restrictions on meetings, contact with other people have affected us all, leading us to an unthinkable situation and therefore we have been forced to use various virtual applications to help us cope with this complicated scenario. In this sense, the educational field at all levels has also had to rethink and adapt the contents to virtuality. The objective of this study was to conceptualize, characterize and describe the importance of virtual education and virtual learning environments in university students in times of the Covid -19 pandemic, based on the review of scientific articles based on the Redalyc, Dialnet and Scielo for the last five years. Made with a descriptive approach, using data collection. Likewise, it was based on the systematic review, using tables for the search, organization and selection of articles, as well as the PRISMA method that may be used by other researchers. The results were 15 articles. In addition, the importance that education and virtual environments have been beneficial for the learning of university students is evident, even more so in times of pandemic.

Keywords: Virtual education, virtual environment, learning, university education, Covid-19

Resumen

La dinámica de todas las actividades sociales, económicas, comercio, salud, transporte, hotelería, etc. que se desarrollaban en todas las sociedades del mundo, han tenido que reformularse debido a la Pandemia Covid-19. El distanciamiento social, las restricciones a las reuniones, el contacto con otras personas nos ha afectado a todos, llevándonos a una situación impensable y que por ende se nos ha hecho forzoso, el uso de diversas aplicaciones virtuales que nos ayuden a sobrellevar este complicado escenario. En este sentido, el campo educativo en todos sus niveles también ha tenido que replantear y adaptar los contenidos a la virtualidad. El presente estudio tuvo como objetivo conceptualizar, caracterizar y describir la importancia de la educación virtual y los entornos virtuales de aprendizaje en estudiantes universitarios en tiempos de pandemia Covid -19, a partir de la revisión de artículos científicos con base en las plataformas Redalyc, Dialnet y Scielo de los últimos cinco años. Realizado con un enfoque descriptivo, usando la recolección de datos. Asimismo, se fundamentó en la revisión sistemática, utilizando tablas para la búsqueda, organización y selección de artículos, así como el método PRISMA que podrán ser empleados por otros investigadores. Los resultados fueron 15 artículos. Además, se evidencia la importancia que la educación y los entornos virtuales han resultado provechosos para el aprendizaje de los estudiantes universitarios más aún en tiempos de pandemia.

Palabras clave: Educación virtual, entorno virtual, aprendizaje, educación universitaria, Covid-19

The Pandemic has led us to an unthinkable situation in which the use of various virtual applications that help us cope with this complicated scenario has been forced on us. Figures compiled by the Institute of Statistics and the International Telecommunications Union indicate that 826 million students did not attend their studies due to the pandemic, because they do not have a computer and on the other hand, 706 million do not access the Internet, coinciding with the situation in which education today is carried out in most countries, remotely^{1,5}.

The international academic community has had to adopt different ways of teaching and learning. To all this is added the emotional, physical and economic problems caused by the pandemic².

At the national level, our country was one of the first to suspend classes in this situation. The State, through the Ministry of Education (MINEDU), is obliged to guarantee the right to education considering its accessibility, availability, quality and adaptability. In addition, for the country, it is a great challenge because there are shortcomings and deficiencies such as the lack of electricity and internet in poor areas³. Given this, the MINEDU published regulations with the purpose of changing and adapting the teaching modalities to the digital form, it has also been financing connectivity and with it the continuity of students in their educational training.

The subject of study Virtual education and virtual learning environments for university students in times of the Covid-19 pandemic, aims to conceptualize, characterize and describe the importance of virtual education and virtual learning environments, likewise the study responds to a systematic review, based on the contributions of authors of scientific articles indexed in the Redalyc, Dialnet and Scielo databases.

The conceptualization of Virtual Education is understood as a system that serves to promote the exchange of ideas and knowledge through various virtual sites, always with the guidance and support of the teacher who directs the educational practice. In addition, virtual teaching-learning education (VTLE) are spaces that allow collaboration and exchange between students, teachers and all those who have access where they develop and participate in the processes of obtaining and strengthening knowledge, skills and values. This form of education integrates synchronous and asynchronous communication instruments used through the WEB^{6,7}.

In addition, three criteria can be considered that define virtual education:

- a) Distancing between students and teachers, during most of the educational process;
- b) The primary use of ICTs and all the media that it encompasses;
- c) The use of synchronous means of communication (RAE, it is carried out in temporal correspondence with another

process or cause) and asynchronous (RAE, it does not have a place in temporal correspondence with another process or cause)⁷.

As for distance education, at first it was blended, carried out with the support of books or through radio or television, the same that began the expansion of education known as blended learning or semi-virtual, with which changes were established of blended forms using platforms, digital resources and virtual tutorials⁸.

Education has changed and it is reflected in the methodologies and strategies, that is, applying active methodologies, gamification (learning technique through games in the professional educational field) and flipped classroom. Therefore, they propose a new theory, the connectivist or known as rhizomatic learning⁹.

These technological tools facilitate autonomy, closeness, teacher monitoring, student participation and the diversity of formats and methodologies for virtual education. The importance lies in being a homogeneous space, that is, an environment where there are no differences of class, race or sex¹⁰. In addition, it is considered within innovation and is applied based on five points: participation, communication, collaboration, sharing and trust aspects that consolidate the determination of strategies to face new challenges in the student training processes. Likewise, it is important because of the possibility it offers for those universities that are interested in the training of the inhabitants of the surroundings of the cities. Therefore, virtual education offers promising future possibilities^{4,11,12}.

On the other hand, the virtual learning environment known as Learning Management Systems (LMS) or virtual environment, also refers to the Virtual Learning Environment (VLE), Learning Management Systems (LMS), Course Management System (CMS), Learning Platform (LP) among other names, is defined as learning spaces mediated by Information and Communication Technologies (ICT). Likewise, virtual teaching-learning environments are access environments designed for collaboration and exchange of knowledge, skills and values in which students and teachers participate, as well as synchronous and asynchronous communication instruments. Virtual environments are Internet-based systems, which is why they integrate many pedagogical tools. For this reason, they have the capacity to create virtual learning environments, even virtual online universities^{7,13,14}.

Universities have been promoting the use of virtual learning environments in face-to-face classes as it allows for flexibility and individualization of education¹⁵. Likewise, the circumstances that have led us to experience the pandemic have forced all educational levels to adapt content to virtuality. Learning occurs continuously, that is, considering our daily events and experiences, and learning is essential in the educational process at all levels^{16,17}.

Also, virtual environments are important, because the way of communication through them is not one-to-many but many-to-many, so the user can create, transmit and consume

information¹¹. According to the experience applied at the University of the Republic, the responses from the students in the adaptation and use of virtual teaching tools and platforms in a synchronous and asynchronous manner was very good, this was evidenced in the active participation of the students^{5,10}. Similarly, a serious playful model was developed, which was applied to the students at the National University of Colombia, the results affirmed that the use of computer environments that consider a gamified and collaborative vision improve learning. In addition, the impact of the use of virtual environments on the students at the Universities of Laica Vicente Rocafuerte and the Salesian Polytechnic was analyzed, resulting in high acceptance with the learning achieved demonstrated by the high averages obtained by the students^{18,19}.

In another study carried out, it is evident that the perception of the students at the University of Valencia about the use of virtual learning environments favors the development of learning in a positive way¹⁵.

A review of scientific literature articles developed internationally was carried out considering the current context. Education in universities has consolidated a distance model and from this the author proposes two scenarios: the virtual university of services and the virtual university of practices. In addition, considering the panorama of e-activities in virtual environments, it is key for student learning since it is necessary for teachers to increase their skills in virtual resources to achieve authentic learning in students^{4,9}.

On the other hand, a virtual classroom was implemented at the National University of Lomas de Zamora, Argentina, to extend the class and promote new learning processes. Likewise, various virtual educational platforms used by teachers and students such as Canva, Desire2Learn, Sakai, Moodle, Blackboard and Edmodo were used, of which the most complete are Canva, Desire2Learn and Sakai. On the other hand, the ministries of Chile, Peru and Colombia have been implementing virtual education as meaningful teaching and learning alternatives^{6,7,11}.

In addition, a game model called COLEGA was developed, used in the artificial intelligence chair of the Faculty of Mines of the National University of Colombia, resulting in the approval of the students, concluding that the game model using smart devices and collaborative learning provides motivational and participatory structures in students¹⁸.

Also, the impact of the use of the virtual platform on the learning of journalism students from Guayaquil universities was determined, using surveys where meta-cognitive and communicative strategies were evaluated, as a result, students are more than satisfied with the learning obtained through the virtual environments provided by the universities, they obtained better averages using the virtual platforms, which is a reflection of better learning; however, other students did not agree with this¹⁹.

Likewise, the improvement of learning of first grade students of the Faculty of Economics of the University of Valencia, Spain, through the adoption and use of virtual environments in face-

to-face classes was evidenced, there being a relationship and positive influence between the perceived usefulness and the subjective norm in its use which determined the learning of the students. Similarly, the educational context of Ecuador was analyzed in order to achieve the paradigm of interactive virtual education, for which documents from various entities were used under the introduction of educational models in Latin America and Europe^{15,19}.

Finally, virtuality strengthened the computer skills of students with the use of the Virtual Learning Environment (VLE), they also had a positive attitude and were motivated and enthusiastic about the new modality due to the novelty of the virtual application¹⁴.

Methodology

The search was started in the Redalyc indexing system, the first search term was the word virtual education, also limiting it only to articles, then it was filtered by: discipline (Education), years (2017 to 2021) and titles, so Finally, 25 complied with the consulted terminology.

Likewise, the Dialnet digital database was reviewed filtering by: title (Virtual Education), articles, years (2017 to 2021), so that we finally had 25 articles as a result considering the words virtual education or virtual environments.

The Scielo electronic library was also reviewed, filtering the word virtual environments, thematic areas (social sciences), years (2017 to 2021), by WOS thematic areas and finally we obtained 24 mentions as a result.

Results

After carrying out the selection process, 74 articles were determined between the years 2017 and 2021, which were arranged as follows: Redalyc 25 articles; Dialnet 25 articles; Sky 24 items. Then, those articles due to duplication were filtered and eliminated, leaving 26 articles. Subsequently, the inclusion and exclusion criteria were applied to establish if they respond to the proposed objective, in this case, to describe the concepts, characteristics and importance of virtual education and virtual learning environments in the Pandemic. Finally, from this second filter, a total of 15 articles were obtained that were selected to respond to our systematic review, all using the prisma method (Figure 1).

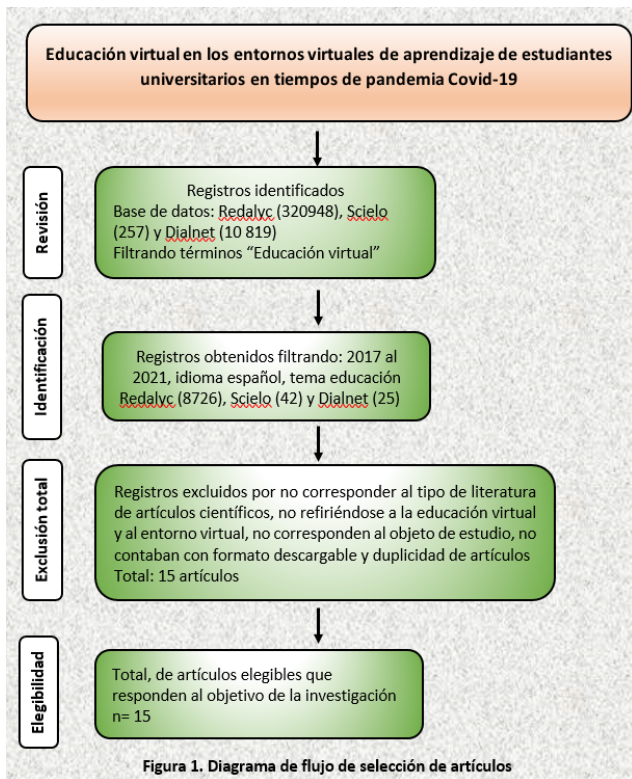


Figura 1. Diagrama de flujo de selección de artículos

Also, information was obtained on the databases consulted, analyzing the 15 articles selected from Redalyc, 10 articles (67%) and from Scielo 5 (33%).

In addition, the 15 articles selected by year of publication have been graphed, having as a result of the 15 articles that, for the years 2017, 2018 and 2019, there is 1 article each (7%) for each year, for the year 2020 it has 7 articles (46%) and from 2021 it has 5 articles (33%)

On the other hand, of the 15 scientific articles, 8 are qualitative, 6 quantitative and 1 mixed.

Likewise, by countries, Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador and Uruguay have published 1 for each one, Cuba 2 articles: Spain and Venezuela 3 articles each.

Likewise, it was possible to determine and visualize percentages, by countries and regions of the world (South America, Central America and Europe) in table N° 1.

Table N° 1 Summary classified by region, country, total articles and percentage

Finally, Table N° 2 is attached, where the selected articles are listed with information on the title, author, year, country, study focus and database, totaling 15 articles.

Regiones	Países	Total	%
América del Sur	Argentina	1	6,67%
	Bolivia	1	6,67%
	Brasil	1	6,67%
	Chile	1	6,67%
	Colombia	1	6,67%
	Uruguay	1	6,67%
América Central	Cuba	2	13,33%
	Ecuador	1	6,67%
Europa	España	3	20,00%
	Venezuela	3	20,00%

Table N° 2 Selected scientific articles

Nº	Título	Autor(es)	Año	País	Enfoque de estudio	Base de datos
1	La educación universitaria en la encrucijada: ¿La inevitable virtualidad?	Ochoa Arias, Alejandro	2021	Venezuela	Cualitativo	Redalyc
2	La evaluación de la educación virtual: las e-actividades	Cabero-Almenara, Julio; Palacios-Rodríguez, Antonio	2021	España	Cualitativo	Redalyc
3	Proceso de aprendizaje en la Pandemia	Abril Lancheros, Myriam Stella	2021	Colombia	Cualitativo	Redalyc
4	Rendimiento académico y deserción de estudiantes universitarios de un curso en modalidad virtual y presencial	Gonzales López, Eduardo; Evaristo Chiyong, Inés	2021	España	Cuantitativo	Redalyc
5	Edward Lee Thorndike y John Broadus Watson: Dos explicaciones del aprendizaje	López Cruz, Delfina Rocío	2021	Venezuela	Cualitativo	Redalyc
6	Edmodo como aula virtual para expandir la formación universitaria	Fernández, Samanta Arreguez Manozzo, Soledad	2020	Argentina	Cuantitativo	Redalyc
7	Análisis crítico de ambientes virtuales de aprendizaje	Zurita Cruz, Carlos Eduardo Zaldívar Colado, Anibal Sifuentes Ocegueda, Ana Teresa, Valle Escobedo, Rocío	2020	Venezuela	Cuantitativo	Redalyc
8	Educación virtual como agente transformador de los procesos de aprendizaje	Mota, Katihuska Concha, Carlos Muñoz Natalie	2020	Brasil	Cualitativo	Redalyc
9	Respuesta al brote de COVID-19: tiempo de enseñanza virtual	Carabelli, Patricia	2020	Uruguay	Mixto	Scielo
10	Virtualización de contenidos académicos en entornos de Aprendizaje a Distancia.	Vargas-Murillo, G.	2020	Bolivia	Cualitativo	Scielo
11	Modelo de juego serio colaborativo basado en agentes inteligentes para apoyar procesos virtuales de aprendizaje.	Alvarez, Santiago, Salazar, Oscar M., & Ovalle, Demetrio A.	2020	Chile	Cuantitativo	Scielo
12	Plataformas virtuales para el aprendizaje periodístico: un estudio en el ámbito universitario de Guayaquil.	Férez Vergara, José Luis, & Camacho Domínguez, Adnam	2020	Cuba	Cuantitativo	Scielo
13	Entornos virtuales de aprendizaje: modelo ampliado de aceptación de la tecnología	Urquidí Martín, Ana Cristina, Calabor Prieto, María Sol, & Tamarit Aznar, Carmen	2019	España	Cuantitativo	Scielo
14	La educación virtual interactiva, el paradigma del futuro	Pérez, C.; Suárez, R. y Rosillo, N.	2018	Ecuador	Cualitativo	Redalyc
15	La educación a distancia en entornos virtuales de enseñanza aprendizaje. Reflexiones didácticas	Lima Monteregro, Sylvia; Fernández Nodarse, Francisco Alberto	2017	Cuba	Cualitativo	Redalyc

Discussion

In recent years, computer technology has developed resoundingly, and this has also had an impact on academic educational processes⁷.

The authors of this study (2017-2021), as they are relevant topics, agree on the concepts, characteristics and importance of education and the virtual learning environment in university students.

Even more so in the context of the pandemic, it has forced us to make changes and adaptations in our daily work. In the educational field, adaptations of curricular forms and contents have been used in an integral way with the help of technological innovations. Virtual education, as defined by the authors analyzed, is understood to refer to the way of teaching and learning in a remote way, using technological tools.

Therefore, it is timely and relevant to understand that the management of conceptualizations of education and the virtual environment are a reference for technological knowledge and learning that will be used more frequently in professional training.

Conclusion

After carrying out the systematic process of the articles found in the Redalyc, Dialnet and Scielo databases that helped us to conceptualize, characterize and describe the importance of virtual education and virtual learning environments in university students in times of the Covid-19 pandemic, different authors have stated that virtual education is understood as a system and/or space that will allow the exchange of knowledge and ideas of those who participate in it (students and teachers), always supported by the teacher, in order to develop the processes of appropriation and consolidation of knowledge, skills and values. Three guidelines can be considered for its definition, the first is the distance that exists during its development, the second is the use of ICTs, and the third can occur synchronously and asynchronously^{6,7}. Regarding the importance of virtual education, it is that in its use there is no differentiation of social classes, sexes, etc. Likewise, it is part of innovation and is developed through participation, communication, collaboration, sharing and trust. These criteria strengthen the determination of strategies in the processes of student training¹⁰.

On the other hand, the authors with respect to the virtual environment indicate that it is known by multiple names such as Learning Management Systems (LMS), Virtual Learning Environment (VLE), Learning Management Systems (LMS), Course Management System (CMS), Learning Platform (LP). Likewise, they define it as learning spaces or environments mediated by Information and Communication Technologies (ICT), organized in such a way that they correspond to the curricular content^{7,10,13}. The relevance of virtual environments lies in the way of communicating since it is not from one to many but from many to many for what the beneficiary manages to do through creativity, transmits and consumes information¹¹.

Finally, according to the analysis of the articles, it is understood that virtual environments conceived as teaching-learning platforms found on the Internet are key tools to strengthen virtual education. That is, virtual education encompasses and uses online environments to develop teaching-learning processes. In the university environment, its adaptation and application has been well received.

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