

# Virtual Environments in Learning: A Systematic Review

Jorge Genaro Ramirez-Delgado<sup>1\*</sup>, Rosa Genoveva Carranza-Dávila<sup>1</sup>, Juan Antonio Guevara-Fernández<sup>1</sup>, Ricardo Nacor Ríos-Lozada<sup>1</sup>, Bertila Hernández-Fernández<sup>1</sup>

<sup>1</sup>Graduate School. Universidad César Vallejo. Chiclayo, Peru.

\* Corresponding author: [cutervojorade@gmail.com](mailto:cutervojorade@gmail.com)

## ABSTRACT

In the current context of the pandemic, it has been a challenge for governments to continue education at all levels. The purpose of this research is to review information related to virtual environments in educational processes. This research has consulted academic databases such as: EBSCO, Scopus, Scielo. In these a general search was carried out using the name and the variable, then the advanced search was carried out using the AND and OR operators, to make the limitations in the selection of documents, in the inclusion criteria such as relevance, topic, language have been considered. years from 2019 to 2022, in terms of exclusion, duplicate articles have been considered, the abstract and language, a sample of 22 scientific articles has been obtained. Finally, we can mention that current education needs an articulated work of face-to-face and virtual scenarios, being indispensable the work in virtual environments for learning. For this, it will be necessary a joint work of the state entities to achieve better conditions of connectivity and technological implementation of the educational institutions.

**Keywords:** virtual environments, learning

## INTRODUCTION

The mandatory isolation due to the pandemic, changed the lives of all people, although it led us to social isolation, this was not a cause for the total paralysis of human activities, on the contrary, it increased the use of technological means and virtual spaces for remote work, distance education. Education in the world was one of the most affected in this context, becoming a great challenge for all governments and educational communities, due to the fact that many of the families did not have the necessary technological resources to face the demands of today's education. Learning in virtual environments drastically replaced face-to-face environments (Esteban-Guitart et al., 2020).

The accelerated shift to virtual reality reflects the precariousness in the design of policies for the digital age, which are perceived by teachers and students; the lack of digital devices, the lack of connectivity, the limited use of technological tools, generates a variation in student satisfaction with respect to this new normal. (Chamorro-Atalaya O., 2021). Moving the

school to virtual spaces has been a necessity, having an important impact on the daily routine of teachers (Vergara & Villanueva, 2021).

Virtual Environments are the spaces that allow us to personalize the new education, motivate the student towards learning or activities that lead us to it, within the multiple possibilities of didactic communication (Urquidi et al., 2019). They are a very useful tool to achieve self-regulated learning (Olivo-Franco & Corrales, 2020). They become an important option for the teaching and learning process in the current context (Olivo-Franco & Corrales, 2020).

On the other hand, these virtual environments have a role of innovation in education (Cedeño & Murillo, 2019), where through the use of technologies it is intended to capture the student's interest, it is linked to the context, needs and interests (Gomez-Torres et al., 2021)..

In the different areas, collaboration in Virtual Environments for Learning has been used more frequently as a research topic are social sciences and on the other hand computer science. The social sciences for its direct relationship with

education, since mainly the studies refer to educational processes, and with computing in education in virtual spaces that occurs today (García-Chitiva, 2019).

Given this modality of expanding knowledge, it will help in innovation in today's classrooms, limited to access to information and time, this was reserved for the social elite, to transcend in new scenarios for ubiquitous, meaningful and horizontal learning to promote a digital inclusion of populations with fewer resources and at the beginning of virtual communities and the collective intelligence (Vázquez-Cano et al., 2018). The proper use of technological resources in education generates autonomy, participatory learning, criticality in students (Gordón, 2020).

Incorporating technological tools in education has great relevance to improve the processes of teaching and learning. That is why we need to create an effective virtual environment to develop learning, teaching through online courses is efficient, it is necessary that the teacher has certain skills in didactics, methodology and technology so that the processes of the teaching and learning is satisfying. (Aguayo et al., 2021), requires the teacher to carry out a reflective practice of their work and of students motivated to develop competencies such as collaborative work, self-regulation and decision making (Chong-Baque, 2021).

For the development of classes in virtual environments it is not enough to master the disciplinary part of the area, it is also necessary to have basic teacher training in ICT, which involves the management of virtual environments (Juanes Giraud et al., 2020). In addition, innovative strategies should be considered in this changing environment for problem solving (Chong-Baque, 2021). Therefore, teacher training and the expansion of their digital skills and the design of strategies are imposed as a priority (Carbonell García et al., 2021).

The ways in which students today access, process amounts of information has changed by the use of digital devices, learning has become more collective. We are talking about a society where knowledge is disseminated, a learning that develops throughout life and that is enriched through social experience, today in digital environments (Hevia Artime & Fueyo

Gutiérrez, 2018). On the other hand, students prefer the insertion of gamification in virtual environments for learning. Gamification generates integral, immersive environments that facilitate the acquisition of knowledge and increase their motivation (Acosta-Medina, 2021).

In Peru, virtual environments emerge as a flexible, viable alternative, a way to democratize and achieve quality education (Llamarca, 2018). On the other hand, the Ministry of Education has been incorporating some educational learning environments, with the objective that teachers carry out their pedagogical work and promote the learning of our students taking into account appropriate content through the use of innovative technologies and methodologies. (Quispe, 2021).

Currently, the process of rethinking educational processes has begun, which must be continued in the post-pandemic context, this must lead to innovation and the transformation of these essential changes; times are coming where the protagonism will be of the multimodal formation (Ruiz-Aquino et al., 2022). Therefore, this article aims to analyze the impacts of virtual environments for student learning.

The purpose of this article is to review information related to the use of virtual environments for learning in the processes of teaching and learning in the current context and the new horizons of education, taking into account aspects such as: its usefulness, assimilation by teachers and students, its advantages to achieve better learning and develop autonomy in students in the construction of their learning. So, we ask ourselves: how do virtual environments influence to improve teaching practice and improve student learning?

The general objective of the article is to analyze studies on the use of virtual environments to generate learning in students and the specific objective is to select and analyze articles on the use of virtual environments.

## METHODOLOGY

The present research has consulted academic databases such as: EBSCO, Scopus, Scielo, are

databases that are known as dataset and files. The different bibliographic databases allow us to boost the analysis of scientific articles (Vuotto et al., 2020). In these a general search was carried out, using the variable of the study where 1683 documents were found, then the advanced search was carried out using the AND and OR operators, which will allow us to perform a more complex information search, then a population of 354 documents has been selected, then these documents have been evaluated by a technique called PRISMA, whose purpose is to support the authors to carry out the systematic review of the articles (Urrútia & Bonfill, 2013).. Finally, a sample of 25 articles has been obtained.

The criteria for inclusion and exclusion were as follows: to make the inclusion, articles considered in the sample were selected taking into account the relevance, open access, type of article, language, subject matter taking into account documents from 2019 to 2021 taken of the aforementioned bases; some duplicate articles have been excluded and taking into account the revision of the title, summary and conclusions.

The exclusion criteria took into account those that are not articles that have been verified or from a systematic review, essays, books, texts that are not available for download.

## RESULTS

From the 25 articles that have been selected for the sample it can be had as a result that work in virtual environments as a complement to face-to-face education in a Post-Covid context are the trend of current education to achieve better learning, the articles analyzed assume the need to make a transition towards the new scenarios for learning as they are today the virtual environments, requiring for this an articulated work of the state institutions that work in the improvement of the technological implementation of and connectivity, on the other hand it is necessary to strengthen the capacities of teachers and students for the management of educational platforms, technological tools, as well as innovative strategies that allow to take advantage of these aspects to achieve more learning significant in our students.

**Table 1.** Conceptual contribution of the articles.

Article No.	Article title	Concept or contribution
1	Educational personalization in times of change and educational innovation	Education in the world was one of the most affected in this context, becoming a great challenge for all governments and educational communities, due to the fact that many of the families did not have the necessary technological resources to face the demands of today's education. Learning in virtual environments drastically replaced face-to-face environments (Esteban-Guitart et al., 2020).
2	Distance education and student satisfaction with respect to pedagogical support services provided in virtual teaching-learning environments	This becomes more relevant and becomes a challenge for the educational community when pedagogical support services must be provided in this context with greater fixation and importance, with the improvement a healthy environment would be obtained, in which a full learning is forged (Chamorro-Atalaya O., 2021).
3	Virtual environments for learning: an expanded model of technological acceptance	Virtual Learning Environments (EVA) are spaces that allow us to personalize the new education, motivate the student towards learning or activities that lead us to it, within the multiple possibilities of a didactic communication (Urquidi et al., 2019)

4	Move from virtual environments to learning: towards a new one  practical teaching mathematics	Today, Information and Communication Technologies flow daily in the educational field and virtual environments have now become the right alternative to develop the educational process (Olivo-Franco & Corrales, 2020).
5	Strengths and weaknesses of the scientific information from a bibliometric perspective.	The different bibliographic databases arise in order to improve the retrieval of information, and introducing a dynamic analysis of scientific articles, an alternative for forms of representation that are based on linguistics and indexing (Vuotto et al., 2020).
6	A systematic review on the use of educational platforms and the relationship with learning for higher education in Peru during the period 2015-2021	In Peru, the Ministry of Education has been incorporating some educational learning environments, with the objective that teachers carry out their pedagogical work and promote student learning by taking into account appropriate content through the use of innovative technologies and methodologies. These were established at the different educational levels and in the Teacher Performance Framework (Quispe, 2021).
7	Key aspects in the continuity of teaching during times of pandemic	For the development of classes in virtual environments it is not enough to master the disciplinary part of the area, it is also necessary to have basic teacher training in ICT, which involves the management of virtual environments (Juanes Giraud et al., 2020).
8	Innovative pedagogical strategies in virtual environments for learning	The innovation strategies described, should be considered by teachers to stop working traditionally in virtual environments, students are provided with an educational resource through technology (Chong-Baque, 2021).
9	Virtual learning environments and the innovative role for the teaching process	The virtual environments for learning have a role of innovation in education (Cedeño & Murillo, 2019).
10	From distance education in the pandemic to  New hybrid modality in the post-pandemic	Therefore, teacher training and the expansion of their digital skills and the design of strategies are imposed as a priority (Carbonell García et al., 2021).
11	Pedagogical strategies in virtual environments for learning	Teachers are required to reflectively practice their work and motivated students to develop competencies such as collaborative work, self-regulation and decision-making (Chong-Baque, 2021).
12	State of research on collaboration in Virtual Learning Environments	The social sciences for their direct relationship with education, since mainly the studies refer to educational processes, and with computing in

		education in virtual spaces that occurs today (García-Chitiva, 2019).
13	The new virtual environments of lifelong learning (MOOC) and their educational possibilities in social and educational fields.	Given this modality of expanding knowledge, it will help in innovation in today's classrooms, limited to access to information and time, this was reserved for the social elite, to transcend in new scenarios for ubiquitous, meaningful and horizontal learning to promote a digital inclusion of populations with fewer resources and at the beginning of virtual communities and the collective intelligence (Vázquez-Cano et al., 2018)
14	Evaluation of academic performance in virtual environments using the NLP model	That is why, in order to create an effective virtual environment for learning and teaching through online courses in an efficient way, it is necessary for the teacher to strengthen their methodological and technological capacities so that the teaching-learning is satisfactory. (Aguayo et al., 2021).
15	Learning situated in the design of virtual learning environments: a peer-to-peer learning experience in a community of practice	The ways in which students today access information and process it have changed by the use of digital tools and devices, learning has become more collective. We are talking about a society of knowledge, learning occurs throughout life and is enriched through social experience in new virtual environments (Hevia Artime & Fueyo Gutiérrez, 2019)
16	Student preference for the use of gamification in virtual environments for learning	On the other hand, students prefer gamification in virtual environments for learning. Gamification generates integral, immersive environments that facilitate the acquisition of knowledge and increase their motivation (Acosta-Medina, 2021).
17	Attitudes towards ICT and the use of virtual environments for university teachers in times of the COVID 19 pandemic	Currently, the process of rethinking educational processes has begun, which must be continued in the post-pandemic context, this must lead to innovation and the transformation of these essential changes; times are coming where the protagonism will be of the multimodal formation (Ruiz-Aquino et al., 2022).
18	The PRISMA declaration	technique called PRISMA, whose purpose is to support authors to carry out the systematic review of articles (Urrútia & Bonfill, 2013).
19	Virtual environments for teaching teachers of regular basic education at the primary level	Where through the use of technologies is intended to capture the interest of the student, is linked to the context, needs and interests (Gomez-Torres et al., 2021)..
20	Virtual learning environments and the development of digital competences in teachers	In Peru, virtual environments emerge as a flexible, viable alternative, a way to democratize and achieve quality education (Llamarca, 2018).

21	From learning in face-to-face scenarios to virtual learning in times of pandemic	The proper use of technological resources in education generates autonomy, participatory learning, criticality in students (Gordón, 2020).
22	Virtual environments for learning: the variables that affect the pedagogical practices of basic education teachers in the Chilean context	Moving the school to virtual spaces has been a necessity, having an important impact on the daily routine of teachers (Vergara & Villanueva, 2021).

Table 2 shows that most of the documents and articles consulted have been published in 2021, representing a total of, since, given the context of the pandemic, the need to work in virtual

environments has been fundamental in distance education in the years 2020 and 2021.

**Table 2.** Number of publications per year.

Year	Nº of articles	%
2018	2	9.09
2019	4	18.18
2020	6	27.27
2021	9	40.91
2022	1	4.55
<b>Total</b>	<b>22</b>	<b>100.00</b>

## CONCLUSIONS

The largest number of studies that have been considered in the sample, are part of database of Scopus, EBSCO and Scielo that give the important space to make publications about the virtual environments that have become very important in the current context. From the different articles that have been investigated we can affirm that education in the post-pandemic context will require an articulated work of face-to-face scenarios and virtual scenarios (hybrid education), being indispensable the work in virtual environments in the learning of students. technological of educational institutions. On the other hand, it will be important not only the willingness and acceptance of teachers but the strengthening of their capacities for the use of technological tools and pedagogical strategies that allow creating a learning environment that

captures the motivation and interest of students, leading them to build their own knowledge collaboratively, achieving its autonomy.

## REFERENCES

- [1] Acosta-Medina, J. K. et al. (2021). *Preferencia de los estudiantes por el uso de la gamificación en entornos virtuales de aprendizaje*. 37(4), 1-5. <https://ajet.org.au/index.php/AJET/article/view/6512/1767>
- [2] Aguayo, R., Lizarraga, C., & Quiñonez, Y. (2021). Evaluación del desempeño académico en entornos virtuales utilizando el modelo PNL. *RISTI - Revista Ibérica de Sistemas e Tecnologías de Informação*, 41, 34-49. <https://doi.org/10.17013/risti.41.34-49>

- [3] Carbonell García, C. E., Rodríguez Román, R., Sosa Aparicio, L. A., & Alva Olivos, M. A. (2021). De la educación a distancia en pandemia a la modalidad híbrida en pospandemia. *Revista Venezolana de Gerencia*, 26(96), 1154-1171. <https://doi.org/10.52080/rvgluz.26.96.10>
- [4] Cedeño, E., & Murillo, J. (2019). Entornos Virtuales De Aprendizaje Y Su Rol Innovador En El Proceso De Enseñanza. *Journal of Chemical Information and Modeling*, 53(9), 1689-1699. <https://dialnet.unirioja.es/servlet/articulo?codigo=7047143>
- [5] Chamorro-Atalaya O., et al. (2021). Educación a distancia y satisfacción del estudiante con respecto a los Servicios de Apoyo Pedagógico prestados en Ambientes de enseñanza-aprendizaje Virtual. *International Journal of Emerging Technologies in Learning*, 16(20), 255-262. <https://online-journals.org/index.php/ijet/article/view/24559/10141>
- [6] Chong-Baque, P. G. (2021). Estrategias pedagógicas en entornos virtuales de aprendizaje. *Estrategias pedagógicas innovadoras con TIC.*, 6, 56-77. <https://doi.org/10.19053/9789586605939>
- [7] Esteban-Guitart, M., Iglesias, E., González-Patiño, J., & González-Ceballos, I. (2020). La personalización educativa en tiempos de cambio e innovación educativa. Un ejemplo ilustrativo. *Aula Abierta*, 49(4), 395-402. <https://doi.org/10.17811/rifie.49.4.2020.395-402>
- [8] García-Chitiva, M. del P. (2019). Revista Medios y Comunicación. *Revista de Medios y Comunicación*, 56. <https://recyt.fecyt.es/index.php/pixel/index>
- [9] Gomez-Torres, S., Flores-Vigil, L., Chacaltana-Huarcaya, R., Chavez-Mauricio, L., Gomez-Torres, R., & Huayta-Franco, Y. (2021). Entornos virtuales en la enseñanza de los docentes de educación básica regular nivel primario: una revisión sistemática. *Revista de Educación y Desarrollo*, 58(3), 29-35. [https://www.cucs.udg.mx/revistas/edu\\_desarrollo/anteriores/58/58\\_GomezTorres.pdf](https://www.cucs.udg.mx/revistas/edu_desarrollo/anteriores/58/58_GomezTorres.pdf)
- [10] Gordón, F. del R. A. (2020). From face-to-face learning to virtual learning in pandemic times. *Estudios Pedagógicos*, 46(3), 213-223. <https://doi.org/10.4067/S0718-07052020000300213>
- [11] Hevia Artime, I., & Fueyo Gutiérrez, A. (2018). Aprendizaje situado en el diseño de entornos virtuales de aprendizaje: una experiencia de aprendizaje entre pares en una comunidad de práctica. *Aula Abierta*, 47(3), 347. <https://reunido.uniovi.es/index.php/AA/article/view/12664>
- [12] Ibaceta Vergara, C. P., & Villanueva Morales, C. F. (2021). Entornos virtuales de aprendizaje: variables que inciden en las prácticas pedagógicas de docentes de enseñanza básica en el contexto chileno. *Perspectiva Educacional*, 60(3), 132-158. <https://doi.org/10.4151/07189729-vol.60-iss.3-art.1235>
- [13] Juanes Giraud, B. Y., Munévar Mesa, O. R., & Cándelo Blandón, H. (2020). La virtualidad en la educación. Aspectos claves para la continuidad de la enseñanza en tiempos de pandemia. *Revista Conrado*, 16(76), 448-452. <http://scielo.sld.cu/pdf/rc/v16n76/1990-8644-rc-16-76-448.pdf>
- [14] Llamacponca, Y. (2018). Entornos virtuales de aprendizaje y desarrollo de competencias digitales en los docentes. *Rev. Yachay*, 7(2004), 411-416. [?yllamacponca@uandina.edu.pe](mailto:yllamacponca@uandina.edu.pe)
- [15] Olivo-Franco, J. L., & Corrales, J. (2020). De los entornos virtuales de aprendizaje: hacia una nueva praxis en la enseñanza de la matemática. *Revista Andina de Educación*, 3(1), 8-19. <https://doi.org/10.32719/26312816.2020.3.1.2>
- [16] Quispe Llamoca, R. (2021). Una revisión sistemática del uso de plataformas educativas y su relación con el aprendizaje en la educación superior peruana en el período 2015-2021. *Iberian Conference on Information Systems and Technologies (CISTI)*, June, 23-26. <https://search.ebscohost.com/login.aspx?direct=true&db=iih&AN=151908298&lang=es&site=eds-live>
- [17] Ruiz-Aquino, M., Borneo Cantalicio, E., Alania-Contreras, R. D., Garcia Ponce, E.

- S., & Zevallos Acosta, U. (2022). Actitudes hacia las TIC y uso de los entornos virtuales en docentes universitarios en tiempos de pandemia de la COVID-19. *Publicaciones*, 52(3), 111-137.  
<https://doi.org/10.30827/publicaciones.v52i3.22270>
- [18] Urquidi, A., Calabor, M., & Tamarit, C. (2019). Entornos virtuales de aprendizaje: modelo ampliado de aceptación de la tecnología. *Revista Electrónica de Investigación Educativa*, 21(1), 1. [http://www.scielo.org.mx/scielo.php?script=sci\\_arttext&pid=S1607-40412019000100122](http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1607-40412019000100122)
- [19] Urrútia, Gerard & Bonfill, X. (2013). *La declaración PRISMA* (p. 2). <https://dx.doi.org/10.4321/S1135-57272013000200001>.
- [20] Vázquez-Cano, E., López Meneses, E., Márquez, E. F., & Ballesteros Regaña, C. (2018). The new virtual environments of lifelong learning (MOOC) and their educational possibilities in social and educational scenarios. *Pixel-Bit, Revista de Medios y Educacion*, 53, 179-192. <https://doi.org/10.12795/pixelbit.2018.i53.12>
- [21] Vuotto, A., Di Césare, V., & Pallotta, N. (2020). Fortalezas y debilidades de las principales bases de datos de información científica desde una perspectiva bibliométrica. *Palabra Clave (La Plata)*, 10(1), e101. <https://doi.org/10.24215/18539912e101>