E-LEARNING AS AN EDUCATIONAL STRATEGY IN UNIVERSITY: A SYSTEMATIC REVIEW

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ABSTRACT

Objective: Analyze the existing literature on the interaction that e-learning allows for university students to develop competencies in learning through the platform, ensuring continuous communication between university teachers and students.

Theoretical framework: E-learning has emerged as a powerful transformative tool in university education. This educational approach leverages information and communication technologies to provide students with flexible and remote access to academic content.

Method: The method used is a descriptive analysis of a literature review with the application of a strategy in the search for scientific information. For this, the analysis of the results and conclusions of 5 articles was applied for problem 1: "Implementation of E-learning," in addition to the analysis of 5 articles for problem 2: "Teacher-Student Interaction".

Results and conclusions: The findings demonstrate that university students interact effectively in a virtual network when it is correctly implemented. Therefore, it can be concluded that the E-learning platform enables the improvement and achievement of teaching and learning through online communication.

Implications of the research: It is expected that the research will contribute to university students' utilization of the e-learning platform as a strategy for the teacher-student dyad, fostering academic and learning development.

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Originality/value: This study demonstrates that currently, e-learning has gained significant importance in higher education, as it facilitates teacher-student interaction and enhances the teaching-learning process.

Keywords: E-learning, Higher Education, Information and Communication Technologies, Virtual Education, Educational Innovation.

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RESUMEN

Objetivo: Analizar la bibliografía existente de la interacción que le permite e-learning a los jóvenes universitarios para desarrollar las competencias en el aprendizaje a través de la plataforma, garantizando la comunicación permanente entre el docente universitario y los estudiantes.

Referencial teórico: El e-learning ha emergido como una poderosa herramienta transformadora en la educación universitaria. Este enfoque educativo aprovecha las tecnologías de la información y la comunicación para proporcionar a los estudiantes acceso a contenidos académicos de manera flexible y remota.

Método: El método utilizado es de análisis descriptivo de revisión bibliográfica de aplicación de estrategia en la búsqueda de información científica para este se aplicó el análisis de los resultados y conclusiones de 5 artículos para el problema 1: “Implementación de E-learning y además del análisis de 5 artículos para el problema 2: “Interacción docente estudiante”.

Resultados y conclusiones: Los resultados demuestran que los estudiantes universitarios interactúan de manera efectiva en red virtual si está correctamente implementada, por lo que se puede concluir que el la Plataforma E-learning permite la mejora y logro de enseñanza aprendizaje mediante la comunicación línea y comunicación.

Implicancias de la investigación: Se espera que la investigación contribuya a los estudiantes universitarios a utilizar la plataforma e-learning como estrategia del binomio docente estudiante, que contribuirá al desarrollo académico y de aprendizaje.

Originalidad/Valor: La presente investigación muestra que, en la actualidad, el e-learning ha cobrado mucha importancia en la educación superior universitaria, ya que facilita la interacción docente – estudiante y mejora el proceso de enseñanza – aprendizaje.

Palabras clave: E-learning, Educación Universitaria, Tecnologías de la Información y la Comunicación, Educación Virtual, Innovación Educativa.

1 INTRODUCTION

The COVID-19 pandemic has exposed serious deficiencies in systems critical for comprehensive development, especially in education (Estrada et al., 2022). In the context of this crisis, the implementation of the virtual education system revealed that a significant percentage of young people face difficulties in accessing education due to the lack of minimum conditions for remote teaching (Estrada et al., 2023). Figures presented by UNICEF indicate that 705,000 university students were forced to abandon their studies due to problems of accessibility to the digital connection.

In response to this situation, it is imperative to explore options that facilitate online organizational learning and knowledge construction. Using e-learning platforms with
interaction strategies and fluid communication, the methodological development of training can be promoted. E-learning emerges as an innovative tool to allow interaction in real time or through resources on the platform, adapting to the location and time of users (Del Pilar, 2020). Aware of these challenges, universities establish strategic plans that seek to positively impact key areas such as training, research and creation (Atherton, 2017).

In this context, it is crucial that university teachers develop digital competences that enable them to interact, advise and monitor the progress of university students' learning. This commitment implies offering opportunities for students to manage the platform effectively, either through experimentation or exploring innovative methods in didactic and pedagogical actions. This will not only encourage independent exploration of knowledge, regardless of curricular areas, but will also stimulate the development of various learning styles, promoting autonomy at work and student-teacher interaction both synchronously and asynchronously (Esteve et al., 2020). It also involves interaction with technological resources that allow the use of digital bibliographic material in a virtual network (Valdés, 2021). This comprehensive approach is essential to overcome current challenges and to maximize the educational potential of emerging technologies.

The development of a systematic review on e-learning as an educational strategy at the university is based on the imperative need to understand in depth and critically evaluate the impact of this modality in the teaching-learning process. In an educational environment characterized by rapid technological evolution, the flexibility and adaptability provided by E-learning present significant opportunities, but also challenges. This review seeks to provide a comprehensive evaluation that contributes to informed decision-making, continuous improvement of educational practices and the generation of scientific evidence that guides future educational research and policies, thus ensuring that the strategies implemented are aligned with current trends and changing expectations of the university educational environment.

Finally, the objective of this research was to analyze the existing bibliography of the interaction that allows e-learning to young university students to develop the competences in learning through the platform, guaranteeing permanent communication between the university teacher and students.

2 METHODOLOGY

2.1 Overview of The Strategy

A systematic and rigorous review of the existing literature was carried out, following the guidelines recommended by renowned authors such as Moreno et al. (2018). In line with the research theme, the systematic review focused on exploring sources of information composed mainly of articles that specifically addressed the topic in question. These articles were carefully selected, ensuring clear and structured summaries of the information obtained, which is available in reliable access sources. This exploratory systematic review process was guided by the guidelines of the PRISMA model (Moher et al., 2020), ensuring a precise and transparent methodological approach.
2.2 Search Strategy

The search strategy adopted involved reviewing and selecting various databases, including Dialnet, Scopus and Scielo. In the search phase in Scopus, logical operators (AND, OR) were used along with specific keywords ("learning AND strategies", "virtual learning AND strategies") in order to retrieve relevant information. Similarly, in searches conducted in Dialnet and Scielo, key terms such as "strategies", "learning" and "virtual education" were used to maximize coverage and obtain meaningful results on the topic of interest ("strategies AND learning AND virtual education", "virtual learning").

2.3 Search Descriptors

In the search for information on articles in other languages, descriptors and their equivalents were implemented in English, as well as in Portuguese, to obtain results in those specific languages. In Scopus, given the nature of the search engine, Boolean operators (AND and OR) were used to find articles with accurate information, supplemented with keywords that allowed to identify direct sources related to the subject of study. In addition, the filters available in the search engines were used. It is important to note that various combinations were made, especially in Scopus, to achieve our goal. Combinations such as "STRATEGY AND LEARNING", "university AND teaching", "learning AND university" were used, applying the corresponding keywords. In the other search engines, such as Dialnet and Scielo, strategies such as "E-Learning in university education" and "learning strategies in university education" were implemented to obtain relevant results. This varied and detailed approach ensured an exhaustive and accurate search for relevant information in different languages.

2.4 Search Criteria

In relation to the criteria used, the search was limited to articles published in the last three years (2017-2021), covering research of various types, such as traditional and systematic reviews. It focused specifically on sources from indexed and arbitrated journals. The search focused on the topic "E-Learning in university education", and keywords were used according to the criteria of the journal search engines. In order to search for direct sources, specific keywords were determined, thus controlling the terms used in search engines. In addition, the information provided in the summaries of the articles was used, and in some cases, full texts were accessed for basic readings of sections such as the introduction, problem, objectives, methodological framework, conclusions and suggestions. Abstracts were the main reference to obtain accurate information from the researched articles.

2.5 Exclusion and Inclusion Criteria

The inclusion criteria were as follows: a) The search was conducted in English, Spanish and, in a particular case, in Portuguese. b) Original articles published in journals with a qualitative, quantitative and even mixed approach were included, covering both experimental and non-experimental designs. c) The revised articles should contain research of any design that related to the subject of review, focusing on the pedagogical activities developed by teachers in virtual university education. d) It was considered relevant that these publications were dated in the last three years, from 2017 to 2021. e) The text presented in the articles should be available in open access and be accessible f) The main topic addressed was "E-Learning in university education" and strategies for learning in university education. g) In this context, the
inclusion of revised articles dealing with strategies used by teachers from different parts of the world in university education was prioritized.

The exclusion criteria were as follows: a) Books, theses, book chapters and research papers were excluded, as the review focused on articles. b) Articles published outside the established years range, i.e. not between 2017 and 2021 were excluded. c) Articles written in languages other than English, Spanish and Portuguese were excluded. d) Closed access articles or articles requiring a cost to access their information were excluded. e) Articles that were not available or not published in the selected journals were excluded. f) Articles that were not available or not published in the selected journals were excluded.

A methodology was designed comprising the following stages: identification, encryption, choice and inclusion. In the first stage, called identification, the exploration was initiated in the SCOPUS database, with 14040, DIALNET with 2850, SCIELO with 1522, documents that were initially identified.

In the second stage, called encryption, the information was refined using specific descriptors in Scopus ("strategies AND learning") and in the journals Dialnet and Scielo the title of the topic under review was applied along with keywords. The search was conducted on November 2 and 3, 2021, and publications prior to 2017 were excluded from the exclusion criteria. Open access items were selected, avoiding repetitive or non-revision area documents. In Scopus 850 documents were obtained, which after a purification resulted in 77 articles to review the summaries. In Dialnet, it started with 198 articles, reducing them to 58 after applying filters and reviewing summaries. In Scielo, 841 articles were obtained, of which 73 were selected after applying filters and reviewing summaries. The latter were carefully evaluated to identify relevant information according to the topic, thus determining precise sources for the review.

**Figure 1.** Methodology for systematic review

**Source:** Own production

In the second stage, called encryption, the information was refined using specific descriptors in Scopus ("strategies AND learning") and in the journals Dialnet and Scielo the title of the topic under review was applied along with keywords. The search was conducted on November 2 and 3, 2021, and publications prior to 2017 were excluded from the exclusion criteria. Open access items were selected, avoiding repetitive or non-revision area documents. In Scopus 850 documents were obtained, which after a purification resulted in 77 articles to review the summaries. In Dialnet, it started with 198 articles, reducing them to 58 after applying filters and reviewing summaries. In Scielo, 841 articles were obtained, of which 73 were selected after applying filters and reviewing summaries. The latter were carefully evaluated to identify relevant information according to the topic, thus determining precise sources for the review.
In the third stage, known as election, reviews of abstracts were carried out, excluding those articles that were not related to the thematic objective of the search. This process resulted in a total of 08 Scopus articles, 13 Dialnet articles and 11 Scielo articles, adding up to a total of 32 revised articles.

In the fourth stage, called as concluded, comprehensive revisions of the texts were made, processing them through the "PRISMA" model (Urrutia & Bonfill, 2010) to identify findings and conclusions. The result was a total of 32 final documents.

![Algorithm based on the Prism model](image1)

**Figure 2.** Algorithm based on the Prism model

*Source: Own production*

![Articles published by database](image2)

**Figure 3.** Articles published by database

*Source: Own production*
3 RESULTS

3.1 Specific Issue I (Implementation of the Platform and Technology Resources)

E-learning as a technological resource of the platform that houses virtual teaching materials, digital learning contents and become in turn transmitters of knowledge, for university students who interact with digital bibliographic material in virtual network.

Table 1. Problem Analysis 1 “E-learning Implementation”

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Document Title</th>
<th>Platform Design</th>
<th>Results</th>
<th>Conclusion</th>
</tr>
</thead>
</table>
| Peraza Cruz, L., Galvizu Díaz, K., Bernardo Fuentes, M., Cruz González, J., & Brooks Rodríguez, M. (2021) | Propuesta didáctica de una innovación educativa con las nuevas tecnologías en las Ciencias Básicas Biomédicas | As a design proposes to work with a Moodle platform that allows them to create and manage dynamic spaces for online learning. | • It makes possible a special situation for learning.  
• It is necessary to deepen the theory that facilitates the practices in laboratory.  
• It is suitable to develop simulation conditions by technological characteristics and their usefulness. (Peraza et.al., 2021) | • A learning situation is identified that can meet the educational demands of students in virtual environments.  
• Specific competences are specified for the development of activities.  
• The Moodle platform allows you to create virtual learning environments in a dynamic way. |
| Rodríguez Chávez, M. (2021).                   | Sistema de tutoría inteligente en la educación superior                           | Its design presents methodologies for students to develop STI as a manager of their learning. (USG)  | • They contribute to identify characteristics that serve as a basis to build a new ITS model  
• Various computer algorithms are used in the service of education. (Rodríguez, 2021) | • Some systems use gamification as an ally to capture learning interest.  
• It is suitable for learning in the area of science.  
• It is personalized and requires the intervention of students to continue restructuring. |
| Alba, M., Sánchez, H., & Ortega, J. (2015)     | Capacitación corporativa de maestros de Yakutía, para aplicar métodos de aprendizaje electrónico | The design they propose considers an iSpring software to create a course based on PowerPoint presentation with audiovisual materials that allows interaction according to the contents of the area | • Most of the teachers who were surveyed, or 87.9%, said that it is necessary to use information technologies to improve the form of distance learning.  
While 11.1% of teachers said that they did not agree with its use due to the difficulties that they faced.  
• 78% of students state that they do not have difficulties.  
• Most university professors were familiar with the platform.  
• The students propose strengths to the strategies proposed in iSpring.  
• Teachers assume that they must migrate to SME use. |
Autonomous tasks were executed with the implementation of Moodle in strengthening learning strategies. We worked with two hypothesis corresponding to the variables “academic performance” (Morales, et.al., 2021).

The implementation strategies in the virtual platform influenced the motivation of the students for the development of the tasks, and also contributed to the improvement of academic performance.

| Morales, J., Sánchez, H., & Rico, M. (2021). | Aprendizaje divertido de programación con gamificación | The design focuses on a branched contribution that allows developing the qualitative approach |

Source: Own production

In the study on the implementation of platforms and technological resources with E-learning in university education, 19 articles obtained from Dialnet, Scielo and Scopus search engines have been examined. 27% of university professors identify that the implementation of a virtual platform can satisfy the educational demands of students in a dynamic way. In addition, 23% of teachers say that the implementation strategies in the virtual platform positively impact the motivation of students and improve academic performance. 14% of teachers familiar with the platform propose innovative strategies to involve students in learning. 32% of the professors state that E-learning in university education helps to identify characteristics of young university students to build a new model of intelligent tutoring systems (ITS), while only 4% disagree with the use of ICT due to difficulties.

As for students, 78% say they have no difficulties in interacting with the platform, 17% believe that these platforms should be continuously updated according to technological advances and 5% believe that it can contribute with the use of computer algorithms to improve the platform. Most students emphasize that working with an E-learning platform allows them to create and manage dynamic spaces for online learning.

3.2 Specific Problem II (Teacher-Student Interaction)

Teachers and students can interact during their training process with e-learning as a space for teaching and learning, processes aimed at the acquisition of one or several competences. Develop digital competences that allow them to interact, advise, monitor the learning process of university students.
Table 2. Analysis of problem 2 “student teacher interaction”

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Article</th>
<th>E-learning teaching and learning</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>López, D. (2016)</td>
<td>El proceso de enseñanza aprendizaje apoyado en las tecnologías de la información modelo para evaluar la calidad de los cursos b-learning en las universidades</td>
<td>The use of communication and ICTs play a fundamental and irreplaceable role, facilitating pedagogical work as well as the learning process in the virtual environment.</td>
<td>Teaching work in teaching has improved with the use of information technologies, as well as strategic institutional processes, and it is concluded that students and their learning are a new example, which helped identify the deficiencies in what was initially planned. (Meia, 2019)</td>
</tr>
<tr>
<td>Cusihuaman, S., Nicolás, G., &amp; Rodríguez, P. (2021)</td>
<td>Los condicionamientos socioeconómicos del aprendizaje colaborativo en una perspectiva compleja en la educación superior virtual en Arequipa</td>
<td>Collaborative methods allow better understanding and rapid generation of new knowledge, must implement pedagogical strategies in virtual education.</td>
<td>One of the most influential factors that limit the normal development of students’ learning in the application of educational strategies is the economic aspect. (Cusihuaman, et.al., 2021)</td>
</tr>
<tr>
<td>Pástor Ramírez, D., Arcos Medina, G., &amp; Lagunes Domínguez, A. (2020)</td>
<td>Desarrollo de capacidades de investigación para estudiantes universitarios mediante el uso de estrategias instruccionales en entornos virtuales de aprendizaje.</td>
<td>The development of competences allows the educational formation as the adaptation to the changes in the current societies, seeking the economic and social development valuing the person through an education according to the current demands.</td>
<td>The use of ICTs is important in the achievement of transversal competences for access to information allowing to expand their knowledge. (Pástor et.al., 2020)</td>
</tr>
<tr>
<td>Herrera, M., Montalvo Apólín, D., &amp; Valdes Lozano, D. (2019)</td>
<td>Estrategias disposicionales y aprendizajes significativos en el aula virtual</td>
<td>At present, the interest of many entities in developing virtual education has arisen, but there is still lack of knowledge in the use of the platforms, this could decrease the effectiveness and opportunities that can be had with their use. It is essential to create an appropriate environment for teacher and student interaction.</td>
<td>The strategies implemented for motivation in virtual education acquire a high level of importance with the interaction of the teacher and his students, allowing the learning that is expected to achieve, looking for the integral formation of the same. The student teacher relationship is part of the strategies for meaningful learning. (Herrera, et.al., 2019)</td>
</tr>
<tr>
<td>López, L. (2019)</td>
<td>Satisfacción estudiantil universitaria un referente para elevar los indicadores de los cursos en línea impulsados por la Coordinación General de Educación Virtual de la UAGro</td>
<td>Teachers facing virtual education must be kept up to date in the use of technologies, which allow them to interact in the virtual plane with their students and thus strengthen the student teaching relationship responding to educational needs.</td>
<td>In virtual education, students are satisfied with the teaching and learning achieved with teacher and student communication in the feedback by the means used. Communication should be valued as an interaction between the teacher and the student. It is the teacher who must know the use of communication technologies allowing him to achieve virtual learning. Manrique Maldonado &amp; Sánchez López, 2019</td>
</tr>
</tbody>
</table>

Source: Own production

In the reviews of E-learning in higher education, specifically focused on teacher-student interaction, 17 relevant articles were identified in the search engines Scopus, Dialnet and Scielo.
29% of these articles highlight the critical importance of teacher-student interaction to achieve effective learning. In terms of teaching-learning and feedback, a survey conducted in Mexico reveals that 40.1% of students consider it easy to establish contact with their teachers through the virtual platform.

As for teaching performance, 42.3% of university students positively evaluate teachers in charge of teaching in virtual mode. When inquiring about the delivery of the learning unit, 62% of students rate the course received as good. Regarding the resolution of doubts, 26.8% indicated that their teachers cleared them frequently, while 34.5% mentioned that this occurred occasionally. In the context of e-learning surveys in the virtual classroom, the indispensable tutor-learner relationship stands out, demonstrating the importance of this interaction. The methodology used to obtain these results includes action research, mixed non-experimental research and a qualitative approach.

3.3 Specific problem III: (Teaching strategy to develop digital competences for training, research and creation in university students)

Considered as an integral part of the ability of the university professor to achieve practices, knowledge and skills in relation to the creative use of communication techniques.

Table 3. Analysis of problem 3 “teacher strategies”

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Article</th>
<th>Methodological strategy of university professors</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pérez, G., Cruz, M., Hernández, R., Naples, P., &amp; Mursulí, S. (2021)</td>
<td>1) Educación a distancia de la maestría durante el periodo de COVID-19</td>
<td>A theoretical methodology was applied to analyze the different documents.</td>
<td>The types of non-face-to-face academic training used made it easier to argue the dynamics of teaching master's degrees in the current moments of pandemic. (Perez et. al., 2021)</td>
</tr>
<tr>
<td>Mayorga, A., Hernández Mite, K., Aveiga Paini, C., &amp; Pacheco Mendoza, S. (2020)</td>
<td>2) Construcción del conocimiento social mediante el e-learning</td>
<td>Design and implementation of an e-learning platform</td>
<td>The use of e-learning in the profession of physical culture reveals the advantages and disadvantages in Ecuadorian university teaching. (Mayorga et. al., 2020)</td>
</tr>
<tr>
<td>Núñez-Barriopedro Estela, Ingrid (Miguelina Monclú) (2019)</td>
<td>3) Realidad Digital para Instituciones de nivel universitario: Modelo y Herramienta</td>
<td>Implementation of computer models for monitoring the use of technology</td>
<td>ICTs are very important in improving academic performance or in any other work. The problem is the little concern of improving skills and abilities in terms of their management.</td>
</tr>
<tr>
<td>López, D. (2016)</td>
<td>4) Modelo de Calidad de E-learning para Instituciones universitarias en Colombia</td>
<td>Various instruments were used to establish the diagnosis of e-learning</td>
<td>The existence of a great difference between universities was determined because, as some are implemented there are others that do not generate great difficulties currently. (López, 2016)</td>
</tr>
<tr>
<td>Jesús Salinas Ibáñez, Bárbara de Benito Crosetti, Adolfiná Pérez García, Mercè Gisbert Cervera (2018)</td>
<td>5) El B-Learning como técnica de enseñanza en la Educación Superior</td>
<td>It was adapted to B-learning as a pedagogical alternative to improve its use in universities.</td>
<td>The use of b-learning seeks a mixed combination between presence and non-presence more useful and close to reality</td>
</tr>
</tbody>
</table>
With regard to objective 3, which corresponds to Analyze the teaching strategies to develop digital competences in university education, it is observed that of the 10 articles analyzed, 3 articles show the importance of the use of e-learning in these times of pandemic, facilitating the interaction of the teacher with the respective students. 2 articles refer to the implementation of a mixed model (B-learning) since there are some subjects that need this combination for their use in face-to-face and virtual activities, especially if some sciences are taken into account. 2 articles mention about the utility of ICT in university education, the same that should be regulated regarding its management and adequacy with the aim of strengthening the capacities of its management by university professors since it is evident that they do not know the mastery of technologies of informative nature and, specifically, those that come from the cellular equipment.

It is also observed that 3 articles argue the importance of the incursion of new strategies such as digital games (DGBL) in the development of classes in the classroom, as well as the use of instruments of assessment of behavioral scales to assess the disposition of instruction at higher university level, as we can also include the use of tactics as a means of instructing in contexts of virtual or distance education to contribute to the development of research capacity.

4 DISCUSSION

According to Mejía (2020), there is still a significant gap between the universities that have successfully implemented E-Learning platforms and those that have yet to adopt this modality. Our research motivates the adoption of measures that value the immediate implementation of these platforms in all universities. This decision is justified not only by the need to maintain updated virtual communication, but also by the characteristics of students, who are considered digital natives.

It has been shown that e-learning in virtual university education, driven by the context of COVID-19, has been adopted as an influential factor that requires immediate and relevant action. Universities have implemented virtual platforms to ensure the continuity of education, although there are still shortcomings to overcome in their use. The interaction between teachers
and students during the teaching-learning process has been fundamental, and the reviewed journals show that this medium has allowed the continuity of education. Strategies played a crucial role, highlighting the role of teachers through the intercommunication and interrelation between teachers and students to achieve the institutional objectives proposed as educational goals.

However, access to the virtual education model has faced challenges, either because of connectivity limitations or because of models adopted by different universities that have prioritized communication between teachers and students to ensure the learning process. Initially, an asynchronous modality was observed, but over time strategies to ensure synchrony increased. The diversity of resources and materials offered by the platforms reflects the strengthening of university pedagogical leadership, with effective responses in terms of connectivity and interaction at the service of teacher training and university students.

Our findings show that the widespread implementation of e-learning platforms in all universities not only responds to the prevailing need for updated virtual communication, but also recognizes and adapts to the characteristics and expectations of a generation of students considered digital natives. Despite the initial shortcomings, the revised evidence strongly supports that e-learning has been essential for the continuity of university education during the challenging period marked by the COVID-19 pandemic. The effective interaction between teachers and students, supported by innovative educational strategies, has demonstrated the ability of this model to achieve the proposed institutional objectives.

Despite the challenges in the implementation and adaptation to synchrony, university pedagogical leadership has emerged strengthened, responding effectively to the changing demands of connectivity and interaction in the service of the educational development of university teachers and students. These findings underline the critical importance of the transition to a broader and more efficient virtual educational model in the current academic context.

5 CONCLUSIONS

The available research indicates that university students achieve an effective interaction in a virtual network when it is implemented correctly. Therefore, the E-learning platform, as a key technological resource, should house virtual teaching materials, digital content, networked bibliography or attached search engines, as well as digital bibliographic material. This gives them the ability to create and manage dynamic environments for online learning.

In the systematic reviews of articles on E-learning, this modality is defined as a strategy that improves the teaching-learning process. However, there is still some lack of knowledge about the effectiveness of these platforms, which could underestimate the importance of this modality. It is essential to create a distractor-free environment to achieve meaningful learning, both for students and for teachers’ pedagogical work. Teachers in virtual education must be constantly updated on the use of technological supports and means to improve their working methodology and avoid generational gaps. With regard to the teaching-learning process, it is concluded that E-learning facilitates the improvement and achievement of learning through online education and communication. Teachers play a key role in guiding students, ensuring effective use of digital tools. In educational practice, the tutor-learner relationship is crucial, as it promotes meaningful learning.

Today, during the pandemic, E-learning has gained great importance in higher university education by facilitating interaction between teachers and students. However, it has also revealed limitations, especially in the achievement of procedural competences in certain areas, such as biological sciences and human medicine. Therefore, it is recommended the implementation of a mixed model (b-learning) that combines face-to-face and virtual activities.
This requires an adequate management of ICT by students and, above all, by teachers, who must become more familiar with the educational use of these technologies.

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