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Implications of Blended learning for university students: A systematic review

Implicancias del Blended learning en estudiantes universitarios: una revisión sistemática

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Abstract

The objective of this study was to analyze the implications of blended learning for university students. To this end, a systematic review was conducted using the PRISMA method. The inclusion criteria included the keywords in English and Spanish: “blended learning” AND “students.” The Scopus and SciELO databases were consulted, considering only open-access articles in both languages published between 2020 and 2025. Restricted access or paid articles were excluded. The search yielded a total of 380 articles in Scopus and 119 in SciELO; after applying the selection criteria, 10 articles from Scopus and 11 from SciELO were analyzed, for a total of 21 studies. The analysis concludes that the success of online learning is closely linked to principles of social justice, highlighting the relevance of blended learning as an inclusive and adaptable alternative in the current educational context. This modality promotes learning experiences characterized by active participation, collaboration between teachers and students, and the strengthening of autonomy in learning. It also facilitates adaptation, reinforces self-efficacy, and encourages more disciplined study habits. Strategies such as video lessons with lightboards, integrated into a blended model, showed significant improvements in academic performance and promoted individualized learning trajectories. The importance of the quality of digital materials and the student's ability to manage their autonomous learning is also highlighted. Finally, educational technologies such as HyFlex, Zoom, and Canvas were positively evaluated, especially when implemented with constructivist approaches aimed at enhancing active learning and a visual theoretical model.

Keywords: blended learning, strategies, autonomy.

Resumen

El objetivo del presente estudio fue analizar las implicaciones del blended learning en estudiantes universitarios. Para ello, se llevó a cabo una revisión sistemática bajo el método PRISMA. Los criterios de inclusión contemplaron las palabras clave en inglés y español: “blended learning” AND “students”. Se consultaron las bases de datos Scopus y SciELO, considerando únicamente artículos de acceso abierto en ambos idiomas, publicados entre 2020 y 2025. Se excluyeron artículos de acceso restringido o de pago. La búsqueda arrojó un total de 380 artículos en Scopus y 119 en SciELO; tras aplicar los criterios de selección, se analizaron 10 artículos de Scopus y 11 de SciELO, sumando un total de 21 estudios. El análisis concluye que el éxito del aprendizaje en línea está estrechamente vinculado a principios de justicia social, destacando la relevancia del aprendizaje combinado como una alternativa inclusiva y adaptable en el contexto educativo actual. Esta modalidad promueve experiencias formativas caracterizadas por la participación activa, la colaboración entre docentes y estudiantes, y el fortalecimiento de la autonomía en el aprendizaje. Asimismo, facilita la adaptación, refuerza la autoeficacia y fomenta hábitos de estudio más disciplinados. Estrategias como las videolecciones con lightboard, integradas en un modelo blended, mostraron mejoras significativas en el rendimiento académico y promovieron trayectorias de aprendizaje individualizadas. Se resalta también la importancia de la calidad de los materiales digitales y de la capacidad del estudiante para gestionar su aprendizaje autónomo. Finalmente, tecnologías educativas como HyFlex, Zoom y Canvas fueron valoradas positivamente, especialmente al implementarse con enfoques constructivistas orientados a potenciar el aprendizaje activo y un modelo teórico visual.

Palabras clave: blended learning, estrategias, autonomía.

Introduction

The incorporation of humanistic values in education, through strategies such as blended learning and practical activities, has been shown to enhance both critical thinking and scientific reasoning, fostering a comprehensive education in students with ethical awareness and social responsibility (Ramírez & Peña, 2022). In this context, the literature distinguishes between peer review—characterized by a vertical relationship—and peer feedback—of a horizontal nature—highlighting the effectiveness of the latter in participatory learning contexts and peer tutoring, which are essential for robust formative assessment (Ezeiza, 2023).

Moreover, advancements in information and communication technologies (ICT), alongside the impact of the COVID-19 pandemic, have solidified online education as a viable alternative, prompting higher education institutions to create and strengthen virtual environments. In this context, innovative resources such as educational video games have been developed to enhance both academic performance and student motivation.

Recent studies on blended English language teaching programs have revealed significant limitations regarding digital infrastructure. They also uncover a range of academic, methodological, and contextual challenges faced by both educators and university administrators, particularly in regional campuses, in effectively implementing such modalities.

In the case of Peru, ICT are playing an increasingly important role in education by facilitating access to information, filling thematic gaps, and promoting collaborative work. Their use in online assessments and creative spaces allows for the development of graphic, linguistic, and numerical competencies, thereby strengthening critical and reflective thinking. However, significant challenges in their pedagogical integration remain, justifying the need for a systematic review of their role in formative assessment (Blanco-García et al., 2022).

In this context, information technologies offer educators and students a multitude of tools that, when strategically integrated as learning resources, can transform traditional teaching models into more dynamic and meaningful educational experiences. This presents a promising scenario for methodological renewal and the reconfiguration of pedagogical models, adapted to the demands of contemporary society (Soncco et al., 2022).

Based on this framework, the following research question is posed: What are the implications of blended learning for university students? In this regard, the objective of this study is to analyze the implications of blended learning in the education of university students through a systematic review of recent scientific literature.

Methodology

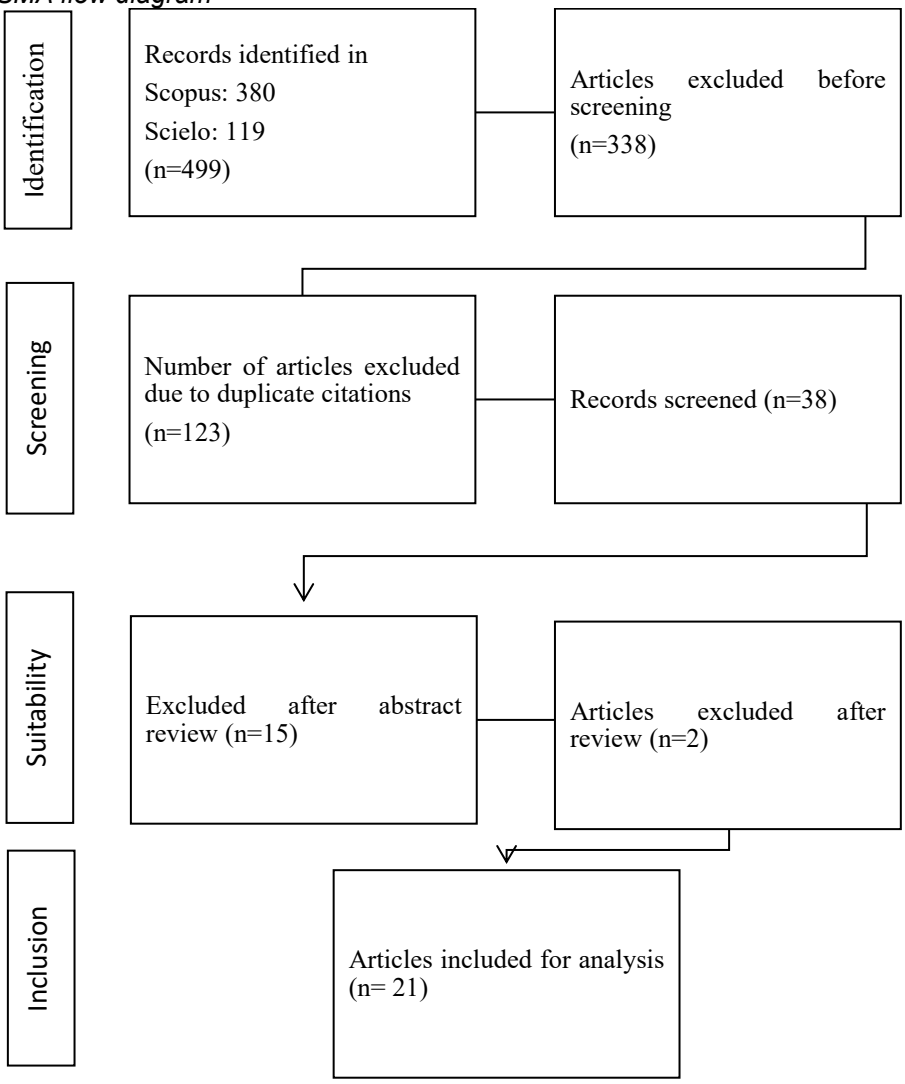
This study was developed under a systematic review methodology, guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. This approach enabled a rigorous, transparent, and reproducible search of relevant scientific literature to analyze the implications of blended learning for university students. Inclusion criteria considered keywords in both English and Spanish: “blended learning” AND “students.” Only articles published between 2020 and 2025, with open access, in Spanish or English, and available in the Scopus and SciELO databases were selected. The search was conducted using the Boolean operator AND to ensure greater specificity in the results.

Regarding exclusion criteria, articles with restricted access, paid or closed access, as well as those not directly addressing the link between blended learning and the experience of university students, were discarded. The initial search yielded a total of 499 articles, distributed as follows: 380 articles from the Scopus database and 119 from SciELO. After applying the established filters and conducting a critical reading of titles, abstracts, and full texts, 21 articles were selected for final analysis: 10 from Scopus and 11 from SciELO (see Table 1). These articles constitute the corpus analyzed in this review.

Table 1
Search keywords in database articles

Database	Search term	Results	Selected
Scopus	“blended learning” AND “students”	380	10
Scielo	“blended learning” AND “students”	119	11
	Total	499	21

Figure 1
PRISMA flow diagram



* Table formatted according to PRISMA with original data

Results

Table 2

Implications of blended learning for students

No.	Author	Implications of blended learning for students
1	Winfield & Whitelaw (2024).	The use of strategies such as the flipped classroom and lightboard video lessons within a blended model significantly improved students' academic performance, particularly among those with prior educational gaps. This demonstrates that proper structuring of activities in blended models is not only perceived positively but can also bridge inequalities and enhance academic success.
2	Papageorgiou et al. (2024).	Student experiences in post-COVID contexts indicate that the success of online learning is closely linked to principles of social justice. In developing countries like South Africa, disparities in access and participation highlight that implementing online or blended modalities requires consideration of structural inequalities to avoid excluding vulnerable populations. This reinforces the importance of a pedagogical approach that ensures equity and accessibility in the design of blended learning.
3	Rocha-Gómez et al. (2024).	The reviewed literature in the field of ontological education indicates that blended learning not only enhances academic performance but also fosters autonomous learning, critical thinking, and clinical preparation, establishing itself as a key educational strategy to address the training challenges of the 21st century.
4	Abbas et al. (2024).	The review indicates that blended learning significantly enhances academic performance, student satisfaction, and engagement in health sciences. However, technological challenges can induce anxiety and frustration, highlighting the need for effective platforms to maximize the benefits of this modality.
5	Castro-Terán (2024	The study revealed no significant differences in learning outcomes in Physics between students in virtual and hybrid modalities, underscoring that pedagogical effectiveness is key to academic success, regardless of the teaching format used.
6	Yesmakhanova et al. (2024).	Research shows that university students' attitudes toward blended learning are initially moderate but improve significantly after experiencing this modality. Furthermore, those with prior experience in blended learning exhibit a more positive attitude, emphasizing the importance of promoting exposure and familiarity with this approach to enhance its acceptance and effectiveness.
7	Govender et al. (2024).	The COVID-19 pandemic accelerated the use of digital technologies in education, increasing students' familiarity with online learning environments. Additionally, online education has expanded access for students with disabilities or medical conditions, underscoring the importance of blended learning as an inclusive and adaptable alternative in current education.
8	Valentieva et al. (2024).	The use of the flipped classroom model as a blended learning strategy has proven more effective than traditional teaching for developing competencies in foreign languages for professional purposes. This approach promotes individualized learning pathways, improves academic performance, and highlights the relevance of the quality of digital materials and the student's ability to manage their autonomous learning.
9	Elizondo-Mejías et al. (2025).	The implementation of the blended education model in Costa Rica during the pandemic revealed significant challenges in the effective application of blended learning, due to factors such as

		irregular attendance, limited connectivity, and variability in school management. Teacher experiences reflected that the strategy, although based on two modalities, resulted in multiple forms of pedagogical mediation that affected both the teaching process and the working conditions of faculty.
10	Nghitanwa et al. (2025).	The integration of technology in higher education facilitated the implementation of blended learning during the pandemic by improving access to content and communication between students and faculty. Most students had technological devices, enabling the continuity of learning from various environments. These findings underscore the relevance of effectively using technology to transform and expand educational opportunities in the current context.
11	Núñez-Rojas et al. (2024)	The study found that educational technologies such as Hyflex, Zoom, and Canvas are positively perceived by students and faculty, particularly in hybrid and distance modalities. Hyflex classrooms received higher ratings in hybrid contexts, while Zoom excelled in distance learning. The widespread positive perception of Canvas suggests its effectiveness as a supportive tool across different contexts. These technologies represent key strategies within blended learning by facilitating adaptation to diverse educational modalities.
12	Fenech (2021).	The study revealed that students in blended learning environments develop a "psychological contract" based on positive educational and relational expectations. They anticipate a learning experience characterized by active participation, collaboration with teachers and peers, as well as autonomy in learning. These findings highlight the importance of blended learning as a model that addresses the needs for flexibility, interaction, and personalization expected by students.
13	Alzer et al. (2023).	The incorporation of demonstrative videos in the teaching of dental anatomical carving has proven to be an effective strategy within the blended learning model, complementing in-person demonstrations and optimizing laboratory time use. This methodology enhances students' understanding of dental anatomical features and facilitates the development of fine motor skills, overcoming limitations such as reduced time and restricted visual field during practical classes.
14	Hill & Smith (2023).	Prior to the pandemic, blended learning had not been normalized in the institutional strategies of the UK, although it was valued for its potential in flexibility, inclusion, and accessibility. The study reveals that the effective adoption of blended learning requires strategic leadership, clear governance structures, teacher professional development, and ongoing support. For sustained and large-scale implementation, it is recommended that institutions formulate comprehensive visions that ensure support and shared strategies aligned with specialized literature.
15	Almohammadi et al. (2025).	Blended learning has solidified as the preferred model post-pandemic, facilitating adaptation, strengthening self-efficacy, and promoting more disciplined study habits. Its implementation was key to maintaining educational continuity under health measures, although it requires robust institutional policies to sustain its effectiveness and long-term motivation. These findings reinforce the importance of blended learning as a tool to optimize learning in changing contexts.

16	Russo et al. (2021)	The study demonstrates that an appropriate pedagogical design in blended learning environments can significantly enhance students' transferable skills, such as writing, especially when considering their individual characteristics and perceptions. This underscores the importance of implementing teaching strategies based on constructivism to promote active learning and academic performance in professional contexts such as accounting and finance.
17	Ali et al. (2023)	The study reveals that, in the context of global dental education, students and faculty evaluate the effectiveness of online learning strategies differently. While students prefer in-person activities for a more interactive learning experience, faculty emphasize the utility of resources like videos and online tutorials. These findings highlight the need to adjust blended learning strategies based on student expectations, promoting a more student-centered approach adapted to the post-pandemic context.
18	Sarkar et al. (2021)	The implementation of a blended learning strategy in anatomy education, which combined online materials with interactive in-person sessions, proved effective in fostering student engagement, active learning, and analytical thinking. Although a clear superiority of computer-assisted learning over traditional teaching has not been established, perception results indicate high satisfaction with digital resources and an improvement in autonomous and deep learning, supporting the pedagogical value of this combined approach.
19	Brown et al. (2022).	The importance of distinguishing between unplanned teaching modalities and intentional blended learning is emphasized, highlighting the necessity of establishing appropriate conditions—such as institutional support, faculty presence, and resources—for blended learning to be implemented effectively and recognized for its true educational potential.
20	Pei et al. (2025).	Through a visual theoretical model and practical strategies, collaborative teaching and greater social cohesion are promoted. The study highlights the importance of a solid theoretical foundation, teamwork, and institutional commitment as pillars to ensure the effectiveness and sustainability of these strategies in the context of blended learning.
21	Sanusi (2022).	The learning experience in blended learning environments is influenced by multiple factors, such as cultural diversity, institutional context, instructional design, and students' technical skills. In the case of international MBA students, engagement and satisfaction do not depend on the type of modality (traditional or blended) but on the quality of the educational experience. Additionally, factors such as age significantly influence the intention to use and accept technology, while gender showed no relevance. This highlights the importance of considering personal and contextual factors when evaluating the impact of blended learning on students.

Importance of blended learning for students

Student experiences in post-COVID contexts indicate that the success of online learning is closely linked to principles of social justice. In developing countries like South Africa, disparities in access and participation demonstrate that implementing online or blended modalities requires addressing structural inequalities to avoid excluding vulnerable sectors. This reinforces the need for a pedagogical approach that ensures equity and accessibility in the design of blended learning (Papageorgiou et al., 2024).

From an ontological education perspective, it has been identified that blended learning not only improves academic performance but also enhances autonomous learning, critical thinking, and professional preparation, establishing itself as a key strategy to address contemporary educational challenges (Rocha-Gomez et al., 2024). Furthermore, it is noted that in areas such as health sciences, this modality increases student satisfaction and engagement. However, the presence of technological obstacles can induce anxiety and frustration, underscoring the importance of functional platforms tailored to user needs (Abbas et al., 2024).

Some studies indicate that there are no significant differences in academic achievement between students learning in virtual and hybrid modalities, suggesting that pedagogical effectiveness is more determinant than the teaching format itself (Castro-Terán, 2024). On the other hand, it is evident that attitudes toward blended learning improve following experience with this modality, and those already familiar with it tend to value it more positively, emphasizing the importance of gradual familiarization to increase acceptance and effectiveness (Yesmakhanova et al., 2024).

The COVID-19 pandemic increased students' familiarity with virtual environments, facilitating educational continuity even for students with disabilities or medical conditions, positioning blended learning as an inclusive and adaptable alternative (Govender, 2024). Additionally, the availability of technological devices favored access to content and student-faculty interaction, strengthening the transformation of educational practices (Nghitanwa et al., 2025).

Several studies highlight that students in blended environments develop a psychological contract based on positive expectations related to active participation, collaboration, and autonomy in learning (Fenech, 2021). Moreover, blended learning has solidified as the preferred modality post-pandemic, as it enhances self-efficacy, adaptability, and disciplined study habits, although it also requires sustained institutional policies to maintain its long-term impact (Almohammadi et al., 2025).

It is also necessary to differentiate between unplanned teaching—resulting from the health emergency—and intentional, designed blended learning, which implies adequate institutional conditions, effective faculty presence, and sufficient resources to achieve successful implementation (Brown et al., 2022).

In multicultural contexts, such as that of international MBA students, it has been shown that factors like age, institutional context, and instructional design have a greater impact on the learning experience than the modality itself. Although gender did not show a significant impact, personal and contextual variables must be considered to adequately assess the impact of blended learning (Sanusi, 2022).

Strategies for blended learning in students

Regarding didactic strategies, the use of video lessons with lightboard and the flipped classroom model within blended frameworks significantly improves academic performance, particularly among students with prior educational gaps, as it helps reduce disparities and enhance academic success (Winfield et al., 2024). The flipped classroom has also proven superior to traditional teaching in the instruction of foreign languages for professional purposes, as it promotes individualized learning pathways, strengthens autonomous learning, and underscores the importance of high-quality digital materials (Valentieva et al., 2024). However, its implementation in countries like Costa Rica during the pandemic revealed significant limitations, such as irregular attendance, poor connectivity, and diversity in pedagogical mediation, which affected both teaching and faculty working conditions (Elizondo-Mejías et al., 2025).

Technological tools such as Hyflex, Zoom, and Canvas were well-regarded by both students and faculty. In particular, Hyflex classrooms were better received in hybrid environments, Zoom excelled in fully virtual contexts, and Canvas demonstrated cross-context effectiveness as a learning support resource (Núñez-Rojas et al., 2024). Additionally, the inclusion of demonstrative videos in dentistry optimized the use of practical time, facilitated the development of motor skills, and improved anatomical understanding (Alzer, 2023).

Before the pandemic, blended learning had not been fully integrated into the institutional strategies of the UK, despite its recognized potential. For successful large-scale adoption, clear governance structures, institutional leadership, and professional development for faculty are required, along with shared strategies aligned with empirical evidence (Hill, 2023).

In fields such as accounting and finance, a pedagogical design based on constructivism can enhance transferable skills like writing when individual factors and student perceptions are considered (Russo et al., 2021). In dental education, students and faculty valued modalities differently: while students preferred face-to-face interaction, faculty highlighted the benefits of videos and digital resources. These findings suggest the need to adjust strategies according to student expectations and the institutional context (Ali et al., 2023).

The use of online materials combined with interactive in-person sessions in anatomy has been shown to foster participation, analytical thinking, and deep learning. Although no clear superiority over traditional methods was established, high student satisfaction supports the value of this combined approach (Sarkar et al., 2021).

Finally, the importance of visual theoretical models and collaborative strategies is highlighted, promoting social cohesion, teamwork, and institutional commitment. A solid theoretical foundation and institutional support are key to ensuring the effectiveness and sustainability of blended learning (Pei et al., 2025).

Conclusions

This study concludes that the success of online learning is closely linked to principles of social justice, underscoring the relevance of blended learning as an inclusive and adaptable alternative in the current educational context. This modality fosters a formative experience based on active participation, collaboration with faculty and peers, and the development of student autonomy. Additionally, it facilitates adaptation to the digital environment, strengthens academic self-efficacy, and promotes more disciplined study habits.

The strategies employed, such as video lessons with lightboard within blended models, demonstrated significant improvements in academic performance while promoting individualized learning pathways. These findings highlight the importance of the quality of digital materials and the student's ability to manage their own learning autonomously.

Moreover, the use of educational technologies such as Hyflex, Zoom, and Canvas was positively evaluated by students. In particular, Zoom proved especially effective in distance modalities, while Canvas showed cross-context applicability as a supportive tool in various educational settings.

Finally, the importance of implementing strategies based on a constructivist approach is emphasized, as this enhances active learning and supports a solid theoretical-practical model. These strategies not only strengthen collaborative teaching but also promote greater social cohesion in the university environment, contributing to a more meaningful, flexible, and student-centered education.

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