



## Impact of Sustainability in Higher Pedagogical Education from the Perspective of the Sustainable Development Goals in Latin America

**Díaz-del Águila, Hilda Rocío**

affiliation: Universidad César Vallejo

<https://orcid.org/0000-0002-6248-0885>; e-mail: [hdiadzela@ucvvirtual.edu.pe](mailto:hdiadzela@ucvvirtual.edu.pe)

**Díaz-del Águila, Fabricio**

affiliation: Universidad Nacional Autónoma de Alto Amazonas

<https://orcid.org/0000-0003-2446-1381>; e-mail: [fabriciodiaz@unaaa.edu.pe](mailto:fabriciodiaz@unaaa.edu.pe)

**Huaranga Rivera, Herbert Víctor**

affiliation: UNA Autónoma de Alto Amazonas

<https://orcid.org/0000-0002-8054-4213>; e-mail: [hhuaranga@unaaa.edu.pe](mailto:hhuaranga@unaaa.edu.pe)

**Valera Vela, Jhaisinio Salomón**

affiliation: Universidad Nacional San Martín

<https://orcid.org/0000-0003-3591-6011>; e-mail: [jvalera@unsm.edu.pe](mailto:jvalera@unsm.edu.pe)

**Vega-Chavez, Raquel Alexandra**

affiliation: Universidad Nacional Daniel Alcides Carrión

<https://orcid.org/0009-0009-3407-2647>; e-mail: [rvegach@undac.edu.pe](mailto:rvegach@undac.edu.pe)

**Alania-Vasquez, Miguel Angel**

affiliation: EESPPP, Piura-Perú.

<http://orcid.org.0000-0003-0368-6063> e-mail: [arbitrodepa@gmail.com](mailto:arbitrodepa@gmail.com)

### Abstract

This article aims to conduct a systematic review of the literature on the impact of sustainability in higher pedagogical education from the perspective of the Sustainable Development Goals (SDGs) in Latin America, covering the period from 2019 to 2024. Using the Prisma methodology, exhaustive search was carried out in databases such as Scopus and Science Direct, employing keywords such as "sustainability," "SDGs," and "higher pedagogical education." The initial search identified 450 records, of which 250 articles met the inclusion criteria. After a detailed analysis, 34 articles were excluded, leaving 17 relevant articles for the review. These studies provide a solid foundation for analyzing how sustainability influences



higher pedagogical education in Latin America, emphasizing the importance of integrating the SDGs into educational programs to promote sustainable development. The results confirm that implementing sustainable strategies in higher education is essential for achieving the SDGs, fostering academic training that responds to global sustainability challenges. This analysis contributes to a better understanding of the role of higher education in sustainable development in the region.

**Keywords:** Higher pedagogical education, Sustainable Development Goals, Sustainability.

## 1. Introduction

In the current context of Latin America, higher education in pedagogy plays a crucial role in training educators to promote and implement the Sustainable Development Goals (SDGs). According to De la Rosa et al. (2019), sustainability is assessed through its integration into academic curricula, the implementation of sustainable institutional policies, and the ability of teachers and students to apply SDG principles in their educational practices. However, according to Salvia and Brandli (2020), challenges such as resource scarcity and the lack of clear policies in higher education limit the effective incorporation of sustainability in the training of educators, affecting the ability of institutions to prepare professionals committed to sustainable development in their communities.

In the international context, Žalėnaukė and Pereira (2021) highlight the growing interest in sustainability in higher education, where integrating sustainability into the curriculum and governance can transform universities. However, the lack of institutional support and specific programs focused on the SDGs remains a challenge. According to López (2024), there is evidence of the importance of harmonizing sustainability research with the Sustainable Development Goals (SDGs) in Latin America, where higher education institutions (HEIs) have the potential to play a catalytic role in the social and environmental transformation of the region. However, they face obstacles such as a shortage of financial resources and institutional support, which restricts the implementation of innovative initiatives. Leal et al. (2022) highlight progress in promoting the SDGs in Latin American universities, although they point out that the scarcity of resources and institutional support hinders systemic transformations and that the disparity between theory and practice remains significant. It therefore follows from the above that international cooperation and adequate professional training for educators are vitally important in overcoming current challenges and translating the principles of sustainability into concrete and effective actions.

At the national level, the implementation of sustainable educational environments in higher education in Peru emerges as a challenge and a crucial opportunity to promote sustainable development. This approach, aligned with the UN Sustainable Development Goals (SDGs) and UNESCO's Global Action Program, underscores the relevance of sustainable



educational infrastructure in academic training and students' environmental commitment. However, the implementation of these practices is hampered by factors such as lack of funding, resistance to change, and limited awareness of their importance (Zelaya, 2023). At the local level, the Pontifical Catholic University of Peru (PUCP) has positioned itself as a leading reference in sustainability in higher education, ranking first in Peru and 17th in Latin America, according to the QS Sustainability Ranking 2024. The institution's leadership in areas such as environmental impact, research aligned with the Sustainable Development Goals (SDGs), social impact, and governance underscores its commitment to sustainable development and its significant contribution to the SDGs in the region (QS World University Rankings, 2023).

Therefore, it is imperative to emphasize that sustainability in higher education in Latin America faces significant challenges that hinder its effective integration, which is essential to achieving the Sustainable Development Goals (SDGs). Higher education institutions, responsible for preparing future educators, face obstacles such as scarce resources, the absence of clear institutional policies, and a lack of comprehensive understanding of the SDGs by teaching staff and students. This problem directly affects the capacity of higher education institutions, such as universities and teacher training colleges, to train educators who can incorporate sustainable practices into their teaching methods. Within the framework of the research, the following question was posed: what is the impact of sustainability on higher education from the perspective of the Sustainable Development Goals?

This systemic research is justified by the need to understand how higher education institutions are incorporating the SDGs into their curricula and pedagogical practices. The relevance of this review lies in its ability to offer a holistic view of the methodologies and approaches used, the challenges and opportunities faced, and the institutional policies implemented. Consequently, it stands as a fundamental pillar for the improvement of the training of future teachers committed to sustainable development. In the field of education, the review of educational systems is an essential component for identifying areas for improvement and good practices that can be replicated and adapted in various contexts. This process not only contributes to the fulfillment of the Sustainable Development Goals (SDGs) established in the 2030 Agenda, but also strengthens education systems in terms of sustainability and long-term viability. In this sense, the review of education systems becomes a key instrument for ensuring that education responds to the development and progress needs of communities and societies in the region.

In the field of scientific research, it has been demonstrated that the application of qualitative research methodology is essential for obtaining relevant data and generating knowledge in specific contexts. In this sense, the use of participant observation techniques and semi-structured interviews are fundamental tools for gathering relevant information and gaining a deep understanding of the phenomena observed. Scientific literature has highlighted



the importance of data triangulation, understood as the integration and analysis of data from different sources, to ensure the reliability and validity of research results. In conclusion, the implementation of qualitative research methodology is an essential component in the development of scientific research, allowing for the generation of relevant knowledge and a deep understanding of the phenomena observed.

The overall objective of this research was to systematically review the existing literature on the impact of sustainability in higher education from the perspective of the Sustainable Development Goals (SDGs) in Latin America. This study outlines the specific objectives set for the research. First, the integration of the Sustainable Development Goals (SDGs) into the curricula of higher education institutions was analyzed. Second, the barriers and challenges in implementing sustainability strategies in higher education were identified. Finally, the experiences and good practices of Latin American universities in promoting the SDGs in Latin America were described.

In the field of theoretical discourse, sustainability emerges as a development approach that seeks to meet present needs without compromising the ability of future generations to meet their own needs (Bongiovanni, 2020). This concept encompasses the harmonization of three main dimensions: economic, social, and environmental. From an economic perspective, sustainability is defined as the efficient and responsible use of resources, with the aim of ensuring long-term prosperity (Salvia et al., 2019). From a social perspective, there is a clear commitment to promoting equity, access to opportunities, and improving the quality of life for all people (Singh & Segatto, 2019). In the environmental context, sustainability focuses on the conservation and protection of the environment, ensuring that natural resources are used in a way that prevents their depletion or degradation for future generations (Vargas et al., 2019).

On the other hand, the importance of sustainability in higher education pedagogy is fundamental because it trains future educators who will be responsible for instilling sustainable values and practices in the next generations (López, 2024). Furthermore, integrating sustainability into teacher training not only prepares teachers to address environmental, social, and economic challenges in their classrooms, but also promotes a culture of responsibility and global awareness among students (Weiss & Barth, 2019). This is essential for achieving the SDGs and ensuring that education actively contributes to the creation of more just, equitable, and environmentally responsible societies (2020).

Higher education in teaching refers to the academic and professional training provided in higher education institutions, such as universities and teacher training colleges, with the aim of preparing future teachers and educators (Guerrero & Faro, 2012). In addition to theoretical training, higher education in pedagogy includes educational practices and classroom experiences to ensure that future educators are well equipped to meet the challenges of teaching and learning in diverse and changing contexts (Saldaña & Gónzales, 2022).



The SDGs, adopted in 2015 by the UN as part of the 2030 Agenda, are 17 global goals that address major global challenges such as poverty, inequality, and climate change (ECLAC, 2020). These interrelated goals promote a balanced approach between the economic, social, and environmental dimensions of sustainable development. The SDGs seek to eradicate poverty, ensure access to essential resources, promote gender equality, and reduce inequalities, thereby guaranteeing equal opportunities for all, while protecting the planet and fostering global prosperity and well-being (Deloitte, 2020).

Therefore, the SDGs prioritize health and well-being, promoting universal access to quality health services, and highlight the importance of inclusive and equitable education that prepares future generations (ECLAC, 2020). They also address environmental protection, tackling climate change and promoting sustainable management of natural resources. In the economic sphere, they promote sustained growth, full employment, and decent work for all, promoting socially inclusive development. In addition, they seek to build peaceful and inclusive societies, strengthen accountable institutions, and foster innovation and sustainable infrastructure (UNIR, 2021).

## 2. Materials and methods

This research was based on a systematic review using databases such as Science Direct and Scopus, covering articles published between 2019 and 2024. An exploration of indexed articles related to the variables of sustainability, pedagogical education, and sustainable development goals was carried out, using the search strategy of the PRISMA model proposed by Page et al. (2021) for the publication of this type of study. The search was performed by titles and keywords, combined with the algorithms “or” and “and.” The titles and abstracts of the selected articles were reviewed, and then the full text was analyzed to determine their eligibility. Cross-sectional studies whose population consisted of higher education students, published in Spanish and English, and conducted in Latin American countries between 2019 and 2024 were considered eligible for inclusion. Exclusion criteria included studies that did not involve preschool, primary, and secondary school students and those with other study designs.

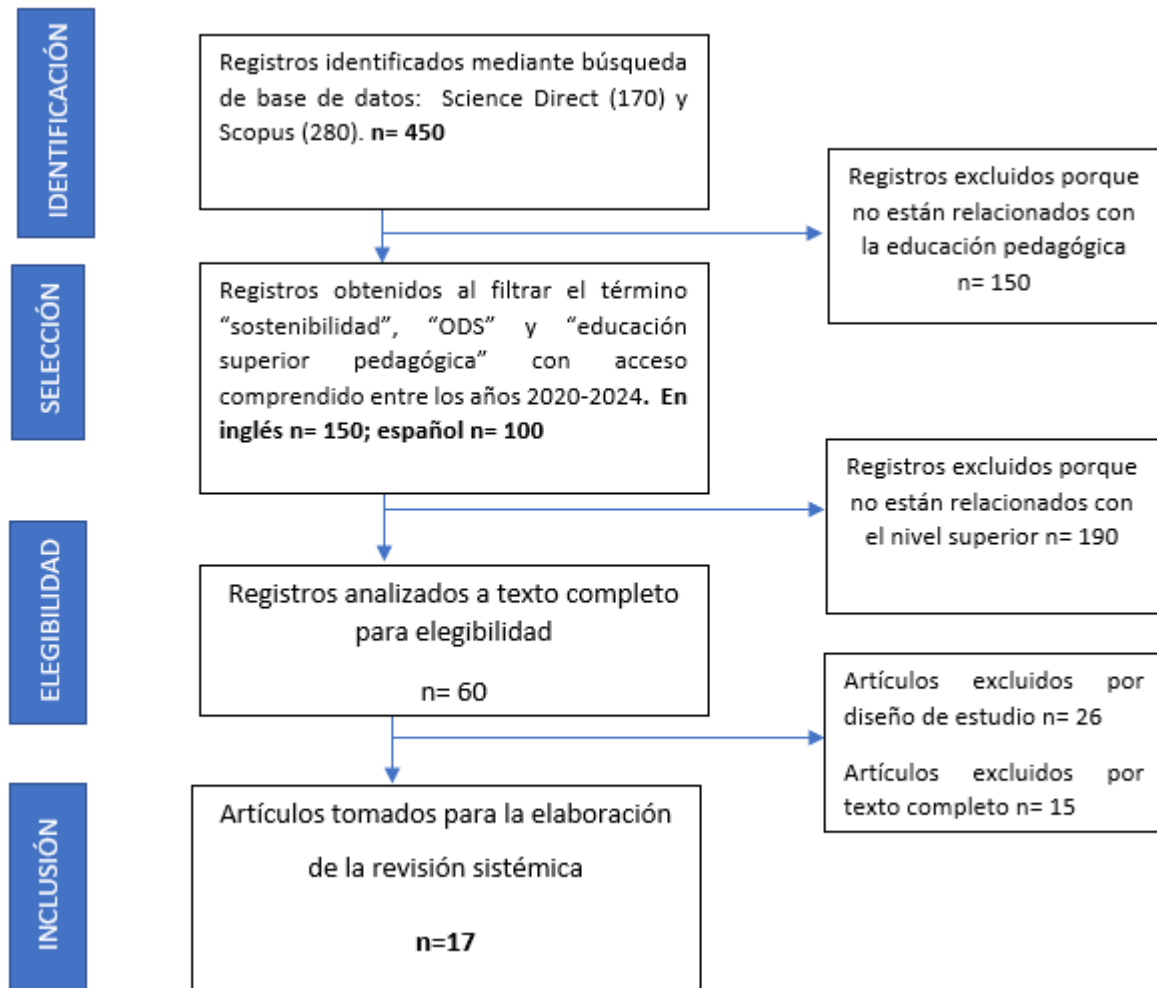
The detailed search strategy is presented in Figure 1. Data extraction was performed using a matrix summarizing the characteristics of the studies, including relevant data such as author, country, study design, population, instrument applied, main results, and conclusion, as shown in Table 1. The quality of the studies (Table 2) was determined using the Newcastle-Ottawa Scale (NOS) adapted for cross-sectional studies. The NOS assesses quality by considering content, design, and interpretation with reliability and validity (Sterne, et al., 2024)

Figure 1 details the process applied for the search and selection of studies.



Figure 1

### Prism Diagram



Note. Prepared by the author.

Each stage of the Prisma diagram is described below:

#### Stage 1: Identification

In this initial stage, an exhaustive search was conducted in two renowned academic databases: Science Direct and Scopus. The search yielded a total of 450 records, with 170 from Science Direct and 280 from Scopus. These records were identified using relevant search terms related to the topic of study.

#### Stage 2: Selection

After initial identification, the records were filtered to ensure they were relevant to the specific research topic. Filtering criteria based on the terms "sustainability," "SDGs," and "higher



education pedagogy” were applied. The records considered had to have been published between 2020 and 2024. This filter resulted in the selection of 250 records, divided equally between publications in English (150) and Spanish (100). In this step, 150 records that were not related to pedagogical education were excluded.

### **Stage 3: Eligibility**

The records selected in the previous stage were analyzed in full text to determine their eligibility. In this process, 60 records were reviewed in detail. During the review, 190 additional records that were not related to higher education were identified and excluded.

### **Stage 4: Inclusion**

Finally, of the 60 records reviewed in full text, 34 articles were excluded for different reasons: 26 because the study design did not meet the established criteria and 15 because the full text was not available. This resulted in the inclusion of 17 articles that were used for the systematic review.

## **3. Results and discussion**

In this section, the results were compiled based on scientific and/or review articles, thus fulfilling both the general and specific objectives. To this end, high-quality articles containing the variables under study were reviewed from scientific databases such as Scopus and Science Direct. As a result, 450 records were identified, of which 170 belonged to Science Direct and 280 to Scopus. From these initial records, those containing the terms “sustainability,” “SDGs,” and “higher education pedagogy” and published between 2019 and 2024 were selected, resulting in 250 articles, divided into 150 in English and 100 in Spanish. Subsequently, 150 records were excluded because they were not related to pedagogical education.

The remaining 100 records were analyzed in full text to assess their eligibility. During this phase, 25 articles were excluded due to their study design and 9 because they did not meet the full text requirements. Finally, 24 articles were selected for the systematic review. These articles provided a solid basis for analyzing how sustainability influences higher education pedagogy from the perspective of the Sustainable Development Goals (SDGs) in Latin America and were key to the development of the study.

Table 1 below describes the systematization of information from articles and has the overall objective of reviewing the existing literature on the impact of sustainability on higher education pedagogy from the perspective of the Sustainable Development Goals (SDGs) in Latin America from 2019 to 2024. This systematization provides a comprehensive and comparative overview of different research studies, thus facilitating critical analysis and synthesis of key findings.



This table provides essential information about each article, such as the name of the scientific portal or journal where the article was published, the digital object identifier (DOI) that provides a direct link to the article, the nationality of the research or authors, the names of the researchers who conducted the study, the year of publication of the article, the main objective of the research, and a summary of the most important results and conclusions of the study. This tool is useful for comparing and contrasting the different approaches and findings of the selected research studies, contributing to a better understanding of the present study.

**Table 1**

Systematization of information from articles

N <sup>o</sup>	Scientific Portal	DOI source	Country	Authors	Year	Objective	Conclusions
1	Science Direct	10.37811/cl_rcm.v6i3.2348	México	Pataca y Flores	2022	Assessing sustainable development through environmental education in Latin America	Sustainable environmental education requires to improve the quality of environmental life. It is crucial to integrate environmental education into educational curricula to promote greater environmental awareness and action. Sustainable programs must generate new resources to improve these aspects.
2	Science Direct	10.47553/rifop.v96i3.5.3.90162	Chile	Mundaca y Carro	2021	Analyze initial teacher training in Chile and its alignment with the SDGs	The integration of the Sustainable Development Goals (SDGs) into teacher training in Chile shows progress, but a more robust and coordinated



approach is needed to ensure that all teachers are trained to address sustainability issues in their educational practices.

3	10.5294/edu.2021.24.2.4	Ecuador	Salcedo, et al.	2022	Assess the impact of SDG 4 at the Technical University of Machala	The Technical University of Machala has made progress in improving educational quality and infrastructure, achieving a positive reclassification in national evaluations. However, it still faces challenges in educational inclusion and equity. Research efforts and program development have improved, but continued support is needed to maintain these advances..
4	10.4067/s0718-07642024000200023	México	López	2024	Analyzing education in Latin America from the perspective of SDG 4	Although some countries have increased their investment in education, most face difficulties in meeting the SDG 4 targets. Setbacks have been observed in certain indicators, such as teacher qualifications and the availability of adequate facilities. It is



						necessary to strengthen education policies and increase funding to achieve the proposed objectives..
5	10.3390/su15118556	Brasil	Fuchs, et al.	2023	Present how the QualEnv consortium of secondary schools adopts the SDGs and demonstrates its contribution to sustainable development (SD).	The adoption of the SDGs is enhanced by social relationships within the consortium, promoting core cohesion and focus on the evolution of each SDG..
6	10.3390/su1508615	Brasil	Machado y Davim	2023	Evaluating sustainability initiatives in Latin American universities	Integrating sustainability into universities does not necessarily entail high costs; significant improvements in sustainability can be achieved with moderate financial efforts..
7	10.3390/su1509833	Chile	Pedraja, et al.	2023	Review Latin American scientific output on SDGs in the field of education through bibliometric	Brazil is the most productive and influential nation in the region, with high levels of international scientific cooperation. Two main lines of research are identified:



						and content analysis.	educational initiatives and student behavior.
8	Scopus	10.3389/feduc.2023.144134	Brasil	Ribeiro et al.	2023	Evaluate the implementation of SDGs in universities and their effectiveness.	Universities play a crucial role in promoting the SDGs, especially in developing sustainable skills among students. However, awareness and adoption of the SDGs are still low and sporadic in many higher education institutions..
9	Scopus	10.1344/reyd2021.1ext.37706	México	Aparicio, et al.	2021	Analyzing the SDGs as a learning tool in university studies.	The integration of SDGs into university curricula encourages a multidisciplinary and holistic approach, promoting sustainability in various areas of knowledge..
10	Scopus	10.3390/su12020542	España	Hernández, et al.	2020	Evaluate the service-learning methodology as a tool for sustainability education.	The service-learning methodology is effective for developing sustainability skills, although its implementation varies widely among institutions..
11	Scopus	10.1007/s10734-020-00652-w	Reino Unido	Chanelsia y McCowan	2020	Analyze the role of Latin American universities in achieving the SDGs.	Universities, being aligned with the SDGs, play a fundamental role in promoting sustainable development through professional training,



research, and innovation. However, significant challenges have been identified in effectively integrating the SDGs into higher education, especially in low- and middle-income countries, where economic constraints, lack of academic autonomy, and external pressures can hinder their full implementation. This study highlights the need for strategies adapted to the local context that enable universities to maximize their impact in achieving the SDGs.

1	Science	10.1016/j.jclepro.201	Brasil	Leal,	2020	Investigate	The study identifies an
2	Direct	9.05.309		et al.		the	urgent need to revise
						participation	academic curricula to
						of higher	more explicitly
						education	incorporate
						institutions	sustainability and SDG
						(HEIs) in the	issues. Furthermore, it
						SDGs.	notes that students are
							not actively demanding
							SDG-related content,
							suggesting an
							opportunity for HEIs to
							foster greater awareness
							and engagement among
							students..



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1	Science	10.1016/j.jclepro.202	Brasil	Leal,	2022	Provide an	HEIs can act as catalysts
3	Direct	2.135694		et al		overview of	for change by
						the	integrating the
						commitment	into their operations,
						of higher	teaching, and research.
						education	However, challenges
						institutions to	remain, such as the lack
						the SDGs..	of cohesion between
							education policies and
							the SDGs, and the need
							for students to take a
							more active role in
							demanding educational
							content that addresses
							these goals.

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1	Science		Méxic	Veláz	2019	Analyze the	Mexican institutions not
4	Direct	10.31644/IMASD.24.	o	quez		impact of	only facilitate access to
		2020.a07				intercultural	higher education for
						universities	marginalized
						on	populations, but also
						sustainable	integrate sustainability
						development.	practices into their
							academic programs and
							community activities.
							The effectiveness of
							intercultural education
							models in promoting
							local development,
							environmental
							protection, and
							improved community
							health is noteworthy..

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1	Scopus	10.1007/978-3-319-	Colo	Herná	2019	Explore	Although efforts have
5		70281-0_9	mbia	ndez,		development	been made to integrate
				et al.		s in education	ESD in Latin America,
						for	implementation has
						sustainable	been limited and

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development uneven. Higher (ESD) in education institutions Latin America and social and compare environmental aspects, these but the lack of a processes systematic strategy has with prevented widespread advances in and effective adoption the European of sustainability in the Union. region. It is suggested that greater collaboration between Latin American and European universities could strengthen capacities and develop mechanisms to ensure a sustainable culture in higher education.

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1	Scopus	10.3389/feduc.2023.1	Estad	Álvar	2023	Investigate	The study identifies
6		205478	os	ez, et		how key	several challenges,
			Unido	al.		competencies	including inadequate
			s			in	teacher training and
						sustainability	resistance to change
						are being	within institutions.
						integrated	These barriers limit the
						into higher	impact of sustainability
						education.	initiatives in higher
							education, suggesting
							the need for more
							structured approaches
							and institutional support
							to achieve effective
							implementation.

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1	Scopus	10.1016/j.jclepro.202	Brasil	Amar	2021	Assessing the	The study highlights
7		1.128093		o, et		competencies	that, although there is
				al.		of university	growing awareness of
						teaching staff	the importance of these
						in sustainable	skills, their integration
						development.	into teaching practice is
							still limited. A more
							systematic approach to
							teacher training and
							professional
							development is needed
							to ensure that teachers
							can effectively teach
							sustainability principles
							and prepare students to
							face global challenges
							related to sustainable
							development..

Note: Prepared by the author.

After registering the scientific and/or review articles in Table 1, the following information is presented: first, the percentages of articles by scientific journal, shown in Table 2.

**Table 2**

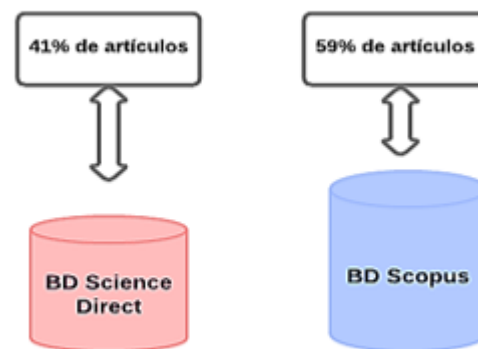
Percentages of articles by scientific journal

Scientific Journal	Frequency	Percentage
Science direct	7	41%
Scopus	10	59%
Total	17	100%

Note: Prepared by the author.

**Figura 2**

Porcentaje de Artículos por Base de datos



Nota. Elaboración propia de la autora

Table 2 and Figure 2 show the distribution of articles according to scientific journal; of a total of 17 articles, it can be seen that the majority (59%) are found in the Scopus database, while 41% of the articles were published in Science Direct, which also reflects their relevance,

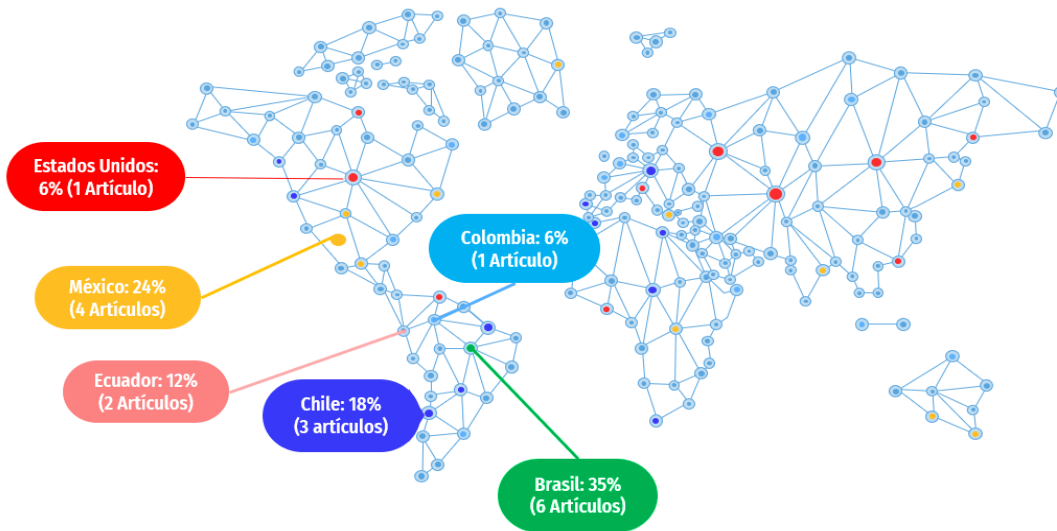


albeit to a lesser extent. This distribution indicates a preference for Scopus in the selection of sources for academic research.

The review of articles also provided information by country, as shown in the following figure:

**Figure 3**

Distribution of scientific and/or review articles by country



Note. Prepared by the author.

A review of the literature on the subject reveals a notable concentration of studies in Brazil and Mexico, which together account for 59% of the research reviewed, indicating a prominent focus in these countries on the implementation of the SDGs in education. Chile and Ecuador have also contributed significantly, with 18% and 12% respectively, which shows a growing interest in these countries in integrating sustainability into pedagogical education. However, the lower representation of Colombia and the United States, each with 6%, could reflect a lower priority or a different focus in the literature reviewed.

**Table 3**

Distribution of scientific and/or review articles by year.

Years	Frequency	Percentage
2024	1	6%
2023	5	29%
2022	3	18%



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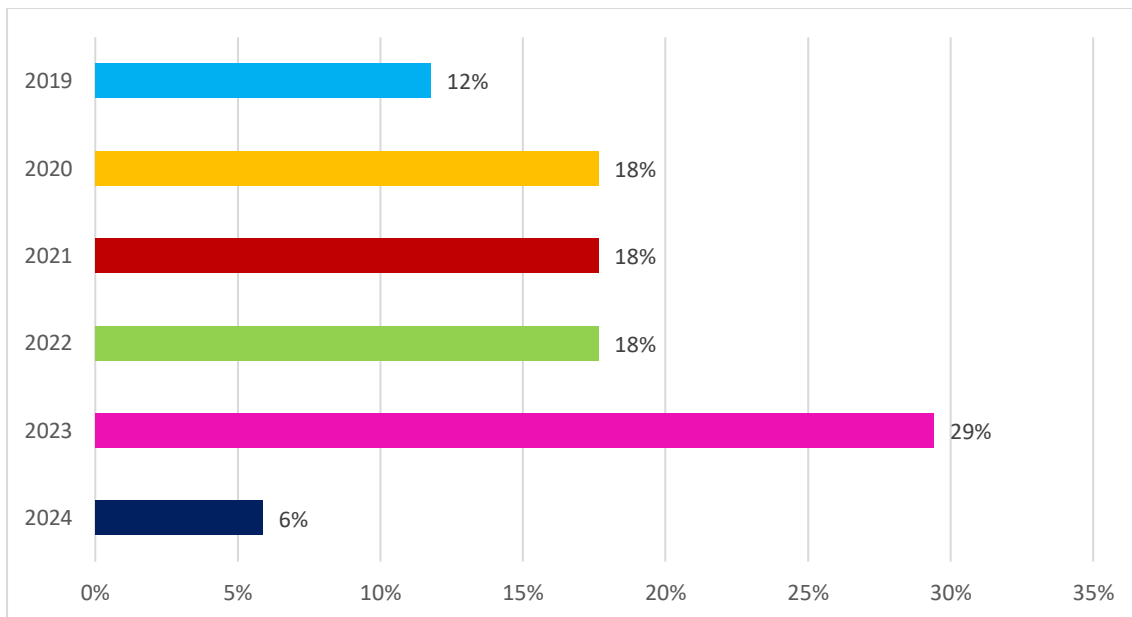
Accepted: 02-09-2025

2021	3	18%
2020	3	18%
2019	2	12%
<b>Total</b>	<b>17</b>	<b>100%</b>

Note. Prepared by the author.

**Figure 4**

Distribution of scientific and/or review articles by year.



Note. Prepared by the author.

Table 3 and Figure 4 show publications in recent years, with 2023 standing out with 29% of the total articles. This increase demonstrates a growing interest and concern in the academic field to address sustainability in higher education, reflecting greater awareness and urgency driven by the 2030 SDG agenda. The years 2022, 2021, and 2020 each account for 18%, indicating continuity in research, while 2019 and 2024 show a lower frequency, with 12% and 6%, respectively.

Following this analysis, we provide an answer to objective 1, which is to analyze the integration of the Sustainable Development Goals (SDGs) into the curricula of higher education institutions in Latin America, as explained below:



**Table 4**

Evidence of the integration of the Sustainable Development Goals (SDGs) into the curricula of higher education institutions in Latin America.

No.	Authors	Year	Institution/Context	Integration of the SDGs
1	Mundaca y Carro	2021	Initial teacher training in Chile	The integration of the SDGs into teacher training in Chile has shown progress, but challenges remain in terms of the consistency and depth of their implementation. This highlights the need for a more coordinated and systematic approach to ensure that all aspects of sustainability are adequately addressed in the preparation of future teachers.
2	Pataca y Flores	2022	Environmental education in Latin America	Sustainable environmental education is key to improving environmental quality of life. However, its integration into educational curricula remains limited, indicating an urgent need for resources and systematic strategies to ensure its effective inclusion in academic training.
3	Fuchs, et al.	2023	High schools in Brazil	Higher education institutions in Brazil have made significant progress in adopting the SDGs thanks to cohesion among participating institutions. Collaboration has made it possible to overcome barriers and promote sustainability, demonstrating that networking is important for integrating the SDGs into higher education pedagogy.
4	Ribeiro et al.	2023	Universities in Brazil	Despite the fundamental role of universities in promoting the SDGs, adoption remains low and sporadic. This underscores the need for a more structured approach to integrating the SDGs into academic programs, strengthening awareness and commitment to sustainability in higher education.



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5	Aparicio, et al.	2021	University in Mexico	The integration of the SDGs into the university curriculum in Mexico promotes a multidisciplinary and holistic approach, which is essential for addressing sustainability. This approach prepares students to tackle complex problems, although its success depends on institutional will and ongoing support.
6	Hernández, et al.	2020	Service-learning methodology in sustainability	The service-learning methodology has proven to be an effective tool for developing sustainability skills. However, its implementation varies between institutions, indicating the need for a more uniform approach to ensure that all universities can take full advantage of this methodology.

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Note. Prepared by the author.

An analysis of the integration of the Sustainable Development Goals (SDGs) into the curricula of higher education institutions in Latin America reveals significant progress, but also major challenges, such as a lack of consistency and uniformity in their implementation. Mundaca and Carro (2021) and Ribeiro et al. (2023) emphasize the need for a more structured and coordinated approach, highlighting deficiencies in the effective integration of the SDGs. In contrast, López (2024) and Weiss and Barth (2019) highlight the importance of incorporating sustainability into teacher training, arguing that it is essential to prepare future educators to face environmental, social, and economic challenges and to instill sustainable values in the next generations.

In this discussion, it is noted that, although inter-institutional collaboration in countries such as Brazil has facilitated progress in the adoption of the SDGs, as pointed out by Fuchs et al. (2023), there is still a lack of a comprehensive vision that promotes a culture of sustainability in all aspects of teacher training. This contrast highlights the need for public policies that not only include the SDGs in curricula but also foster an educational environment that models sustainable practices and makes students socially and environmentally responsible.

As a contribution, it is proposed that strategies to integrate the SDGs should go beyond mere curricular inclusion, promoting a cultural shift towards sustainability within educational institutions. This will not only prepare educators to address global challenges but also strengthen the role of education in building more just and sustainable societies, aligning with the perspectives of López (2024) and Weiss and Barth (2019).



Consequently, specific objective 2, Identify barriers and challenges in the implementation of sustainability strategies in higher education in Latin America, was addressed.

**Table 5**

Barriers and challenges in implementing sustainability strategies in higher education in Latin America.

<b>N</b>	<b>Authors</b>	<b>Year</b>	<b>Barriers/Challenges Identified</b>
1	López	2024	Setbacks in key areas such as teacher qualifications and educational infrastructure are limiting the implementation of the SDGs in Mexico. Despite increases in educational investment, deficiencies in these critical areas are preventing the effective fulfillment of the goals of SDG 4, which focuses on ensuring quality education.
2	Leal, et al.	2020	In Brazil, the lack of review of academic curricula and the low demand for sustainability content among students are significant barriers. This highlights a disconnect between educational policies and student expectations, which hinders the effective integration of the SDGs into higher education.
3	Leal, et al.	2022	There continues to be a lack of cohesion between educational policies and SDGs in Brazil, and demand for sustainable content remains low among students. These challenges underscore the need to improve coordination between institutions and foster greater student interest in sustainability issues to achieve effective implementation.
4	Hernández, et al.	2019	In Colombia, the implementation of education for sustainable development has been limited and uneven. Although there has been progress in social and environmental aspects, the lack of a coherent strategy has prevented widespread and effective adoption, highlighting the need for more integrated policies and collaborative approaches in the region.
5	Álvarez, et al.	2023	Resistance to institutional change and a lack of adequate teacher training are key barriers to integrating sustainability skills in the United States. These obstacles limit the impact of sustainability initiatives, indicating the need for stronger institutional support and a more structured approach to overcoming these barriers.



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| 6 | Amaro, et al. | 2021 | The integration of sustainability skills among teachers in Brazil is still limited, despite recognition of its importance. The lack of a systematic approach to teacher training limits their ability to teach sustainability effectively, highlighting the need for more effective policies and greater institutional commitment. |
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Note. Prepared by the author.

In Table 5, the findings obtained are contrasted with the theoretical definitions provided by authors in the field of sustainability. According to Bongiovanni (2020), sustainability is a comprehensive approach that seeks to balance present and future needs, encompassing economic, social, and environmental dimensions. In this context, the results show that the implementation of sustainability strategies in the region faces significant obstacles that compromise this balance. For example, the lack of cohesion between educational policies and student demands in Brazil (Leal et al., 2020, 2022) reflects a dissonance that prevents the achievement of long-term economic prosperity and equitable access to educational opportunities, which aligns with the concerns of Salvia et al. (2019) and Singh & Segatto (2019) regarding the need for equitable and fair development.

Furthermore, institutional resistance to change and insufficient teacher training observed in studies such as those by Álvarez et al. (2023) and Amaro et al. (2021) underscore the urgency of greater accountability in human and educational resource management, which is essential for social and economic sustainability. This lack of institutional adaptation also undermines environmental conservation efforts, as education is fundamental to raising awareness and training future generations in environmental protection, as argued by Vargas et al. (2019). Consequently, deficiencies in infrastructure and teacher qualifications, mentioned by López (2024), not only limit the implementation of the SDGs, but also jeopardize the ability of future generations to meet their needs, contravening the basic principle of sustainability.

As a contribution, it is evident that strategies to integrate sustainability into higher education must be more comprehensive, promoting not only the inclusion of the SDGs in curricula, but also a cultural change that fosters an educational environment committed to sustainable practices. This will not only prepare educators for global challenges but also strengthen the role of education in building more equitable and sustainable societies, aligning with the vision of an education that models sustainable values from teacher training.

Finally, specific objective 3 was addressed, describing the experiences and good practices of Latin American universities in promoting the SDGs.



**Table 6**

Experiences and good practices of Latin American universities in promoting the SDGs.

N°	Authors	Year	Experiences/Best Practices
1	Salcedo, et al.	2022	The Technical University of Machala has significantly improved its educational quality and infrastructure, achieving a positive reclassification. However, it continues to face challenges in educational inclusion and equity. This experience underscores the importance of a sustained focus on improving these aspects in order to achieve a lasting impact on higher education.
2	Fuchs, et al.	2023	Higher education institutions in Brazil have promoted cohesion and focus on the SDGs through collaboration between institutions. This strategy has made it possible to overcome barriers and advance sustainability, demonstrating that networking is essential for integrating the SDGs into higher education. This model can be replicated in other regions to improve the adoption of the SDGs.
3	Machado y Davim	2023	Latin American universities have demonstrated that it is possible to achieve significant improvements in sustainability with moderate financial efforts. This emphasizes that the lack of large budgets is not an insurmountable obstacle to the implementation of sustainable practices, provided there is institutional commitment and adequate strategic planning to optimize available resources.
4	Velázquez	2019	Intercultural universities in Mexico have facilitated access to higher education for marginalized populations by integrating sustainability practices into their programs. This approach has been effective in promoting local development and environmental protection, presenting a model that could be replicated in other institutions to address global challenges from an inclusive and contextualized perspective.
5	Chankseliani y McCowan	2020	Latin American universities play a fundamental role in promoting sustainable development, but they face significant challenges in effectively integrating the SDGs due to economic constraints and a lack of academic autonomy. This study



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			highlights the need for strategies adapted to the local context to maximize the impact of these institutions in achieving the SDGs.
6	Ribeiro et al.	2023	Universities in Brazil have made progress in promoting the SDGs, but adoption remains low and sporadic. This underscores the need to improve awareness and commitment to sustainability in higher education, as well as to foster collaboration between institutions to overcome the barriers that still persist.

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Note. Prepared by the author.

the findings contrast with those of ECLAC (2020), which explains the importance of the SDGs as a comprehensive framework for addressing key global challenges such as poverty, inequality, and climate change, promoting a balanced approach between the economic, social, and environmental dimensions of sustainable development. This theory coincides with the experiences described in Table 6, which shows that although universities have made significant efforts to promote the SDGs, as in the case of the Technical University of Machala and the intercultural universities in Mexico, they still face significant barriers, especially in terms of inclusion, equity, and economic sustainability (Salcedo et al., 2022; Velázquez, 2019).

The contrast between the results obtained in practice and the objectives outlined by the UN and other international organizations, such as Deloitte (2020) and UNIR (2021), highlights the gap between theory and practice in the region. Although the SDGs prioritize universal access to essential services, inclusive education, and sustainable resource management, studies by Fuchs et al. (2023) and Ribeiro et al. (2023) show that the adoption of these goals is uneven and sporadic in Latin America. This reflects a lack of resources and effective strategies to overcome these challenges, which in turn limits the positive impact that these institutions could have on sustainable development.

A significant contribution that emerges from this discussion is the identification of the need to adapt SDG implementation strategies to the local context of each university. As Chankseliani and McCowan (2020) point out, limited resources and a lack of academic autonomy are obstacles that require a strategic approach adapted to local realities. This added value lies in the promotion of inter-institutional partnerships and the creation of collaborative networks that allow universities to share resources, knowledge, and successful experiences, as has been demonstrated in the case of Brazil (Fuchs et al., 2023). By strengthening these networks and adapting strategies to the particularities of each context, many of the current barriers can be overcome and progress toward the goals of the 2030 Agenda can be made more effectively, thus ensuring that Latin American universities play a more prominent role in promoting fair, inclusive, and sustainable development.



## 4. Conclusions

- Systematic analysis of the literature shows that sustainability in higher education in Latin America, from the perspective of the SDGs, has gained relevance in recent years. However, the integration of the SDGs into educational curricula remains uneven and faces significant challenges, such as a lack of consistency in implementation and limited adoption by institutions. Despite growing efforts, a more coordinated and systematic approach is needed to ensure that higher education not only trains competent professionals but also citizens committed to sustainability.
- The integration of the SDGs into the curricula of higher education institutions in Latin America shows notable progress, especially in countries such as Brazil and Mexico. However, significant challenges remain in the consistency and depth of this integration, underscoring the need for more robust policies and more systematic strategies to ensure that all future teachers are prepared to effectively address sustainability challenges in their educational practices.
- - Barriers and/or challenges to the implementation of sustainability strategies in higher education teacher training in Latin America face significant obstacles, such as institutional resistance to change, lack of adequate teacher training, and a disconnect between educational policies and student demands.
- These barriers limit the effective adoption of the SDGs, indicating the need for a more structured approach and greater institutional support to overcome these challenges and ensure a more effective and lasting integration of sustainability in higher education. Experiences and good practices in promoting the SDGs in Latin American universities show that inter-institutional collaboration and adaptation to local contexts are key to advancing sustainability. However, the adoption of these practices remains sporadic and uneven. To maximize the impact of universities on sustainable development, it is essential to foster collaborative networks that allow for the sharing of resources and successful experiences, and to adapt implementation strategies to the particularities of each institution and region.

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