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Rumo à sustentabilidade: uma análise da implementação dos Objetivos do Desenvolvimento Sustentável em Instituições de Ensino Superior

Towards sustainability: an analysis of the implementation of the Sustainable Development Goals in Higher Education Institutions

Hacia la sostenibilidad: un análisis de la implementación de los Objetivos de Desarrollo Sostenible en las Instituciones de Educación Superior

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KEYWORDS

Bibliometric Research.
Regional Development.
Social Capital.

Abstract: The 2030 Agenda for Sustainable Development draws attention to learning opportunities throughout its implementation process. This study aimed to carry out a bibliometric analysis to identify the actions and approaches in articles concerning the implementation of the Sustainable Development Goals (SDGs) in HEIs from 2015 to November 16, 2021. It also sought to identify the temporal evolution of publications and the most recurrent terms. The database used was Scopus, from which we identified the most relevant studies and the journals with the most publications on the subject. The analysis of the results was supported by the Biblioshiny app and was based on 54 scientific articles which were published in 20 journals and written by 211 authors and co-authors. We found that the qualitative was the most used approach and the most frequent research strategy was the case study.

PALAVRAS-CHAVE

Pesquisa
Bibliométrica.
Desenvolvimento
Regional. Capital
Social.

Resumo: A Agenda 2030 para o desenvolvimento sustentável chama a atenção para oportunidades de aprendizagem ao longo de seu processo de implementação. O objetivo desta pesquisa foi realizar uma análise bibliométrica para identificar as ações e abordagens nas pesquisas sobre a implementação dos Objetivos do Desenvolvimento Sustentável (ODS) em IES, no período de 2015 a 16 de novembro de 2021, além de identificar a evolução temporal das publicações e os termos mais frequentes. A base de dados utilizada foi a Scopus, da qual identificou-se os estudos mais relevantes e os periódicos que mais publicaram sobre o assunto. A análise dos resultados – apoiada pelo aplicativo Biblioshiny – se deu a partir de 54 artigos científicos, publicados em 20 periódicos e escritos por 211 autores e coautores. Constatou-se que a abordagem mais utilizada é qualitativa e a estratégia de pesquisa mais frequente é estudo de caso.

PALABRAS CLAVE

Investigación
Bibliométrica. Desarrollo
Regional. Capital Social.

Resumen: La Agenda 2030 para el Desarrollo Sostenible llama la atención sobre las oportunidades de aprendizaje a lo largo de su proceso de implementación. El objetivo de esta investigación fue realizar un análisis bibliométrico para identificar las acciones e los enfoques en la investigación sobre la implementación de los Objetivos de Desarrollo Sostenible (ODS) en las IES, desde 2015 hasta el 16 de noviembre de 2021, así como identificar la evolución de las publicaciones y los términos más frecuentes. La base de datos utilizada fue Scopus, a partir de la cual identificamos los estudios más relevantes. El análisis de los resultados, respaldado por la aplicación Biblioshiny, se basó en 54 artículos científicos, publicados en 20 revistas y escritos por 211 autores y coautores. Los resultados muestran que el enfoque más utilizado es el cualitativo, mientras que el estudio de casos es la estrategia más frecuentemente aplicada.

Introduction

The United Nations (UN) approved the Sustainable Development Goals (SDGs) at its 70th General Assembly in 2015, focusing on the development of a more sustainable world and addressing the complexities of global problems. The SDGs are defined as an action plan for people, institutions, the planet, and prosperity (UN, 2015). They are also known as the 2030 Agenda, which includes 17 Sustainable Development Goals as well as 169 targets that should be achieved by 2030 (UN, 2015).

To this end, many efforts need to be coordinated and several actors are required to collaborate in order to successfully achieve this plan, which can be pursued through different paths (UN, 2015; Wubah et al., 2021). Social capital can be one of these paths since actors can obtain benefits through integration into collaborative social networks (Boeira & Borba, 2006; Melo, Regis, & Bellen, 2015). Social capital must be fostered to increase trust and reciprocity among groups, networks, and organizations (Putnam, 2006). Thus, the importance of institutions, organizations, and actors for the development of society reverberates - such interaction among them is related to the social progress of people and their surroundings (Kempton et al., 2021).

Higher Education Institutions (HEIs) are key spaces for finding the solutions set out in the SDG through teaching, research, and outreach, as well as due to their intrinsic social capital (Blasco, Brusca, & Labrador, 2021). HEIs can boost productivity, entrepreneurship, and innovation in the region where they are located. For instance, as the HEIs have access to new forms of funding by participating in different spheres, they also enable regional partners (civil society, the productive sector, entrepreneurs, public management, etc.) to access the social capital of such institutions as well as the knowledge, innovation, and technology produced there (Christ, Frohlich, & Mattiello, 2021; Kempton et al., 2021).

Overall, there is a scientific gap concerning the issue to which this study aims to contribute. The

objective of this study is to carry out a bibliometric analysis and identify actions as well as approaches used in research on the implementation of the SDGs in HEIs, published between 2015 and November 16, 2021. Although there are various paths to address the SDGs, the focus of this research was the methodological approaches being used by researchers on the subject of implementing the SDGs in HEIs rather than adopting or discussing concepts. To this end, we selected only studies whose objective was related to the implementation of the SDGs in HEIs, despite the cross-cutting nature permeating the issue.

In addition to shedding light on what the education sector (particularly the HEIs) has done to date, the present study can provide insights into actions that could be replicated in the future in terms of decision-making and supporting the development of strategies for such institutions regarding the issue. The relevance of the study lies in being one of the first ones to conduct a systematic review focusing on the implementation of the SDGs in HEIs based on social capital.

The paper is structured into five sections. The first (1) section introduces the reader to the topic. The second one (2) approaches the literature review on the implementation of the SDGs in HEIs. The third (3) section presents the methodological procedures. The fourth one (4) analyzes the results. The fifth (5) section addresses the final considerations.

How the SDGs are implemented in HEIs: brief notes

Since their inception, Higher Education Institutions (HEIs) - including Universities - have been subjected to processes of transformation and movements that question their *raison d'être*. The mission of a University is threefold: to safeguard and protect the values of civilization (1), to produce knowledge (2), and to provide outreach and innovation services (3) (Kempton et al., 2021; Santos & Almeida Filho, 2012). However, efforts to justify the relevance of HEIs have required the

ability to change while maintaining the original responsibilities and taking on new challenges, such as sustainability (Ezquerro-Lázaro et al., 2021).

Sustainability represents an alternative form of economic growth that does not jeopardize environmental development, human rights, or future generations (UN, 1987). This concept encompasses pursuing processes that are less environmentally degrading and more socially responsible. Sustainability is essential for companies in organizational contexts due to the need to ensure business continuity. In organizations, it is integrated with economic, social, and environmental concerns (Brown, Dillard, & Marshall, 2006; Dias, Silva, & Viana, 2021).

In this sense, the 2030 Agenda can be considered as an action plan for Sustainable Development. This proposal calls for updating legal frameworks to promote favorable institutional and financing conditions which, in turn, can economically value investments and innovations that result in environmental protection, social inclusion, and justice as well as sustainable economic growth (Prieto-Jiménez et al., 2021).

The document that originated the SDGs (Agenda 2030) states that the journey to "a world free of poverty, hunger, disease and want, where all life can thrive" (UN, 2015, p. 3) will involve governments as well as parliaments, the United Nations system and other international institutions, local authorities, indigenous peoples, civil society, businesses and the private sector, the scientific and academic community - and all people.

In Brazil, the Plano Nacional de Educação - PNE (National Education Plan) and the Base Nacional Comum Curricular - BNCC (Brazilian National Common Core Curriculum) can be mentioned in the context of education for sustainable development, especially regarding the 2030 Agenda. For Pimentel, "the PNE is a reference document for education policies at the national, state, and municipal levels" (2019, p. 27). The BNCC is a "normative document that outlines the progressive set of essential learning skills that all students should develop throughout basic

education" (Brasil, 2020, p. 2).

According to the Sustainable Development Solutions Network (SDSN Australia/Pacific, 2017), universities can contribute to the education and teaching of the SDGs as follows: include the SDGs in all undergraduate and graduate courses, as well as in postgraduate research training; provide SDG training for all course coordinators and faculty; offer executive education and training courses based on the SDGs for external stakeholders; advocate for the implementation of national and public education policies that support education for the SDGs; involve students in co-creating learning environments that foster learning about the SDGs; develop courses aimed at real-world collaborative projects for change.

Körffgen et al. (2018) summarize the role of HEIs in the implementation of the SDGs in five key points: carrying out research aimed at real problems in society; critically reflecting on the SDGs and their associated measures; educating future decision-makers by promoting critical and systemic thinking; publicizing and sharing examples of best practices for sustainable development on campus; and fostering political-science-society partnership.

Leal Filho et al. (2021) emphasize the need for a more significant focus on SDGs in the context of teaching, research, and operations at HEIs, as well as on strategic issues. For the authors, incorporating the 2030 Agenda into institutions is a complex but worthy task. Also according to them, four factors should be considered when implementing the SDGs in HEIs, namely: institutional (policy, strategy, planning, and governance); thematic (interdisciplinarity, variety of topics, broad scope, and multiple uses); structure (resources, equipment, materials, and operations); and personal/individual (interest, concern, awareness, and commitment).

In light of the relevance of this topic, Murillo-Vargas, Gonzalez-Campo, and Brath (2020) raised the following question: "Is the integration of the Sustainable Development Goals and Universities a field of study?". The authors mapped the relationship of sustainable

development goals in universities and concluded that there is a new field of study yet to be explored, as evidenced by the level of scientific production.

Considering the context of a Brazilian public University, Christ (2022) interviewed fourteen people in management positions of a higher education institution in southern Brazil and found that the HEI has been implementing the 2030 Agenda in its environments, albeit in a reactive way.

The following section presents the present study's procedures for finding papers that explore the relationship between the implementation of the SDGs in HEIs.

Methodological procedures

This chapter describes the methodological procedures of the systematic review in order to carry out a bibliometric analysis and identify the approaches used in research on the implementation of the SDGs in HEIs. The systematic review was conducted using the PRISMA research protocol (Moher et al., 2010) based on questions designed according to the researchers' prior knowledge of the topic. Initially, a search string was constructed by including terms related to the research topic.

The final version of the search string built for the Scopus (Elsevier) journal database is shown in Table 1. The terms used to search the database (search string) were "sustainable development goals" associated with "university" or "social capital". The search was applied to the title, abstract, and keywords as well as the amount of results in terms of the number of publications.

Table 1
Search string for the articles in the portfolio

Database	Search string	Results
Scopus	TITLE-ABS-KEY ("sustainable development goals" AND "University" OR "social capital")	564

Source: Survey results (2022).

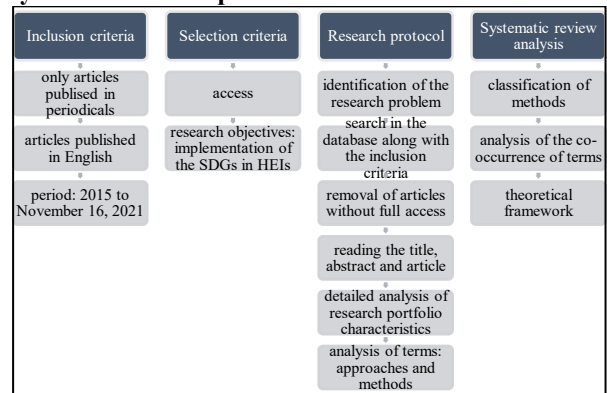
The database (Scopus) was used because it presented the required data format for bibliometric analysis in the Bibliometrix app. This app is an

open-source tool for carrying out a comprehensive mapping analysis of scientific literature (Aria & Cuccurullo, 2017).

Three inclusion criteria were considered in this study: articles published in journals; articles published in English to capture the latest international literature on the topic; and articles published between 2015 and November 16, 2021, in all areas of knowledge.

The research protocol (Figure 1) was built based on the classification taxonomy, consisting of the following stages: (i) identifying the research problem; (ii) searching the database using the inclusion criteria; (iii) selection criteria; (iv) reading the title, abstract, and articles to identify the agreement among the study and the research questions as well as the topic; (v) detailed analysis of the characteristics of the research portfolio; (vi) finally, an analysis of the terms to identify the approaches and focus of the research (Barbosa, Noronha, & Piffer, 2020).

Figure 1
Systematic review protocol



Source: Elaborated by the authors based on Barbosa, Noronha, and Piffer (2020).

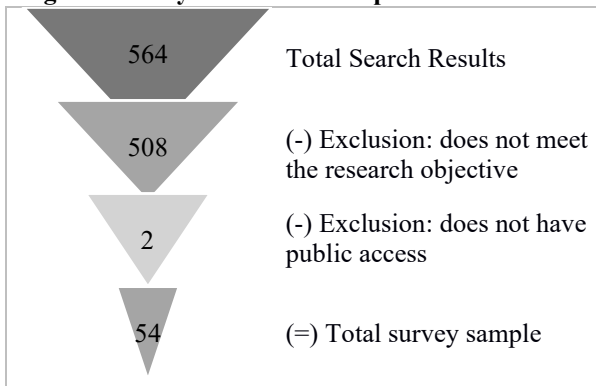
The search string identified 564 results. Two publications were removed from the article database due to lack of access and 508 publications were excluded because their respective research objectives were not related to the implementation of the SDGs in HEIs. As a result, 54 publications remained and were analyzed according to the criteria outlined in this research. Figure 2 illustrates the refinement of the search to better understand this stage of the

systematic review protocol (stage 3), i.e. the selection criteria.

The selected documents were analyzed using the Biblioshiny app, which is part of the Bibliometrix 2.1.2 package (Aria & Cuccurullo, 2017), developed for use in the R 4.1.2 programming language. In addition to the research protocol presented in Figure 1 and Figure 2, the analysis of the systematic review was conducted in three stages.

The first stage (i) of the systematic review sought to answer the following research questions: What is the annual frequency of publications? Which are the most cited studies in the analyzed research portfolio? Which journals publish research on the SDGs? The first stage also included the use of the bibliometric indicator ‘number of citations’ to assess the structure of citations received by authors and co-authors in the corpus, as they demonstrate a level of influence since researchers cite papers they consider important.

Figure 2
Stage 3 of the systematic review protocol



Source: Elaborated by the authors (2022).

In stage (ii) of the systematic review, word clouds were built based on the most frequent terms obtained from the abstracts, titles, and keywords assigned by the authors of the articles. The term “word cloud” refers to the organization and grouping of a set of words according to their occurrence, which makes it possible to identify the lexical content of the bibliographic portfolio.

Finally, in stage (iii) of the systematic review, a summary table of the research approaches used by the 54 studies in the portfolio was developed, as

well as a table with the main exploratory studies from six countries, considering the factors that influenced particular countries in implementing the SDGs in their respective HEIs.

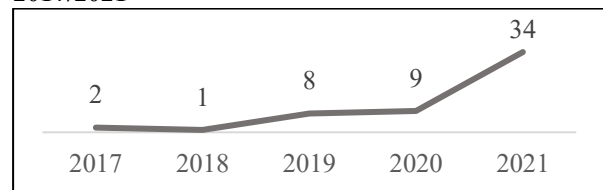
Results and Discussion

This section presents the research results, including three bibliometric analyses: the productivity of the authors and the productivity of the journals, the frequency of occurrence and co-occurrence of words, and the approaches used by the authors.

Productivity

This section presents a descriptive analysis of the portfolio that pertains to the indicators related to the citation and content of the 54 selected articles. Thus, the analysis includes the number of articles published over time, the geographical distribution of authors and co-authors, and the composition of authorship in the works in the portfolio. Figure 3 presents the temporal evolution of the frequency of publications presented by all the authors and co-authors in the portfolio. Based on the 54 articles analyzed in this research, the highest number of publications occurred in 2021, with 34 papers overall, which represents 62.96% of the survey (Figure 3).

Figure 3
Temporal evolution of the portfolio’s publications: 2017/2021



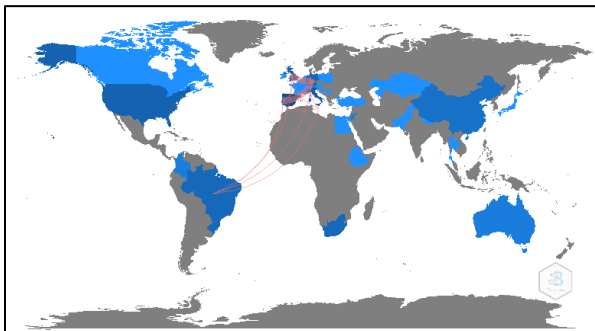
Source: Survey results (2022).

The average number of citations for the 54 articles in the portfolio throughout the analysis was 7 citations per published paper, distributed among 211 authors and co-authors. We also identified an average of 3.91 authors and co-authors per article. To analyze cooperation

between the authors of co-authored publications, the Collaboration Index (Koseoglu, 2016) was identified: We observed that the average number of authors per joint paper was 4.2, indicating that on average just over 4 authors signed the jointly published articles.

Considering the origin of the authors' affiliation, 31 countries were identified in the portfolio. The most frequent country was Spain (32 occurrences), followed by Italy (20), Brazil (10), Portugal (9), the United States (9), the United Kingdom (8) and Germany (6). Figure 4 shows the location of the institutions to which the authors are affiliated and the scientific collaboration between the countries in the portfolio.

Figure 4
Scientific collaboration between countries



Source: Survey results (2022).

Among the researchers who have collaborated the most with authors from other countries are Brazil and Portugal, with 10 collaborative publications from each country. Brazilian authors collaborated more frequently with Germany, Malta, Portugal, and the United Kingdom, each having two publications, as well as one publication with Poland and one with Serbia. Portuguese authors, in turn, published more often with Germany (3 publications), Malta and the United Kingdom (2 collaborations each), the Netherlands, Poland, and Serbia (with one publication in each country).

Chart 1 displays the number of citations for 31 publications included in the corpus of this research, listed in descending order from the most to the least cited. The remaining 23 publications in the portfolio were not cited in the Scopus database and,

as a result, are not displayed in Chart 1. The average number of citations per year was calculated by dividing the number of citations by the number of years elapsed since the date of publication.

Chart 1

Total number and average number of citations per year for 31 articles in the portfolio

Authors	Total number of citations	Average number of citations
(LEAL FILHO et al., 2019)	101	33,67
(OWENS, 2017)	48	9,60
(PURCELL; HENRIKSEN; SPENGLER, 2019)	39	13,00
(KÖRFGEN et al., 2018)	27	6,75
(MAWONDE; TOGO, 2019)	20	6,67
(MORI JUNIOR; FIEN; HORNE, 2019)	16	5,33
(OMISORE et al., 2017)	15	3,00
(PALETTA; BONOLI, 2019)	12	4,00
(CÁMARA; FERNÁNDEZ; CASTILLO-EGUSKITZA, 2021)	11	11,00
(CHANKSELIANI; QORABOYEV; GIMRANOVA, 2021)	10	10,00
(KIOUPI; VOULVOULIS, 2020)	9	4,50
(LEAL FILHO, 2020)	7	3,50
(LEAL FILHO et al., 2021)	6	6,00
(PRANDI et al., 2021)	6	6,00
(ZHU; ZHU; DEWANCKER, 2020)	6	3,00
(DE LA POZA et al., 2021)	5	5,00
(SAITUA-IRIBAR; CORRAL-LAGE; PEÑA-MIGUEL, 2020)	5	2,50
(CHANG; LIEN, 2020)	5	2,50
(TORABIAN, 2019)	5	1,67
(MURILLO-VARGAS; GONZALEZ-CAMPO; BRATH, 2020)	4	2,00
(FRANDOLOSO; REBELATTO, 2019)	4	1,33
(GOODALL; MOORE, 2019)	4	1,33
(FAHIM et al., 2021)	2	2,00
(PRIETO-JIMÉNEZ et al., 2021)	2	2,00
(IBÁÑEZ et al., 2020)	2	1,00
(PEROVIĆ; KOSOR, 2020)	2	1,00
(PIZZUTILO; VENEZIA, 2021)	1	1,00
(MAWONDE; TOGO, 2021)	1	1,00
(HAUSER; RYAN, 2021)	1	1,00
(ELMASSAH; BILTAGY; GAMAL, 2021)	1	1,00
(SMANIOTTO et al., 2020)	1	0,50

Source: Survey results (2022).

The most cited authors, Leal Filho et al. (2019), explore the benefits of introducing the SDGs in education, serving as a catalyst to inspire students in HEIs to engage with the concepts of sustainability. The research technique involved an online questionnaire with 9 questions (7 closed-ended and 2 open-ended) that was applied over 40 days and received 167 responses from 17 countries. In conclusion, the authors made four suggestions for HEIs to address the SDGs: align their curricula and research with the SDGs (1); develop, test, and use new methods of approach (2); develop more applied (practice-oriented) research (3); engage the student community more actively towards commitment and action in support of the SDGs (4).

Owens (2017), the second most cited author, draws attention to two essential factors for higher education to play a renewed role in the sustainable development framework: publicly funded research and regional higher education partnerships. For the author, regional cooperation is a strategy to build capacity in the higher education sector. Regional networks help governments understand how other countries in similar situations have responded to these issues and even guide them in their next steps.

Purcell, Henriksen, and Spengler (2019), authors of the third most cited article, investigate different forms of sustainability strategies within the SDGs, encompassing several case studies from the UK, Bulgaria, and the USA. The study shows that each case study is a living laboratory that emphasizes the importance of partnerships with and within Universities to achieve the SDGs. For the authors, placing sustainability as a central strategic agenda can connect stakeholders within the University with those outside the University to progress toward achieving the SDGs with networks based on a common purpose. There is no one-size-fits-all approach or plan to draw universities and the SDGs closer together.

Table 2 presents the number of articles published in each journal (20 in total) in the bibliographic portfolio.

Table 2
Number of publications per journal

Journals	Number of publications
International Journal of Sustainability in Higher Education	20
Sustainability (Switzerland)	13
Sustainability (United States)	3
Journal of Cleaner Production	2
Administrative Sciences	1
Amfiteatru Economic	1
Education Sciences	1
Environment Development and Sustainability	1
Ethiopian Journal of Health Sciences	1
European Journal of Education	1
Higher Education	1
International Journal of Environmental Research and Public Health	1
International Journal of Life Cycle Assessment	1
International Journal of Management Education	1
International Journal of Work-Integrated Learning	1
Journal of Social Marketing	1
Journal of Teacher Education for Sustainability	1
Multimedia Tools and Applications	1
Pegem Egitim Ve Ogretim Dergisi	1
Sustainability Accounting Management and Policy Journal	1

Source: Survey results (2022).

The International Journal of Sustainability in Higher Education had the largest number of articles, consisting of 37.04% of the publications analyzed. Next, there was Sustainability (Switzerland) with 13 publications, followed by Sustainability (United States) with 3 publications,

and the Journal of Cleaner Production with 2 publications. The remaining 16 journals had only one publication each.

The list of journals included various areas of knowledge inherent to the theme of sustainable development. However, the most frequent area is sustainability and education. Journals in the areas of administration, health, and public health were also featured. This survey demonstrates the complexity and cross-cutting nature of the sustainable development goals, regarding all its different facets and from the perspective of different groups addressing the problem.

The frequency of occurrence and co-occurrence of words

Figure 5 depicts the 50 most frequent terms extracted, respectively, from the abstracts, keywords, and titles (highlighted in Figure 4) of the 54 articles in the corpus, categorized according to the objective, methodology, and results of the study. The word clouds are developed based on the word incidence matrix, in which the size of the terms is proportional to their occurrence.

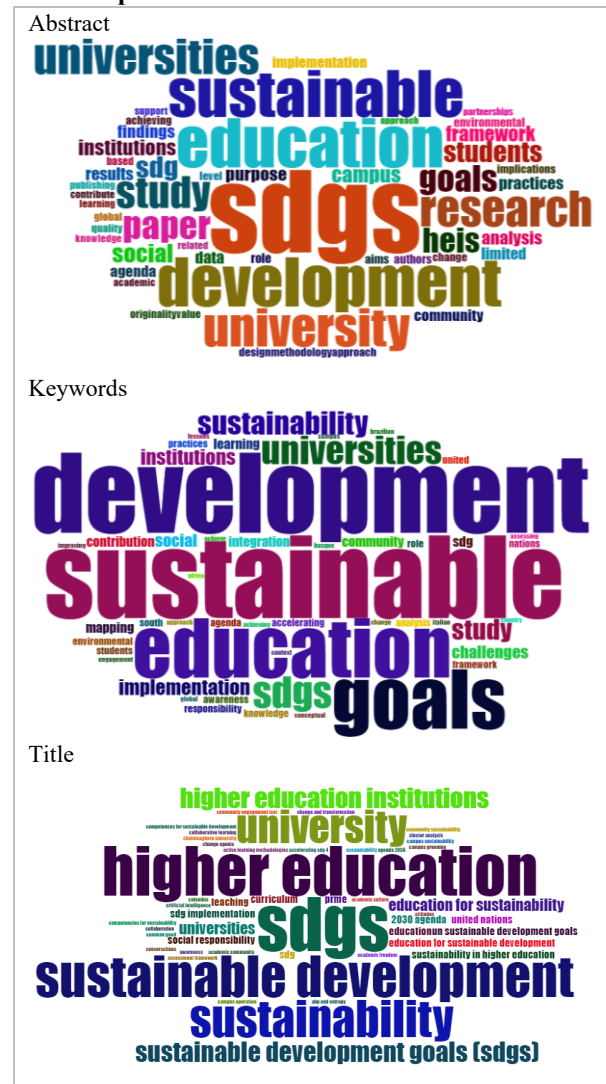
The ten most frequent terms in the abstracts of the 54 articles were: SDGs (209 times), education (125 times), development (124 times), sustainable (118 times), university (97 times), research (90 times), universities (89 times), sustainability (83 times), study (81 times), and paper (71 times).

Regarding the keywords assigned by the authors to identify the 54 articles, the ten most frequent terms were: sustainable development goals (25 times), SDGs (13 times), higher education (12 times), sustainable development (10 times), sustainability (9 times), university (8 times), higher education institutions (5 times), sustainable development goals (SDGs) (5 times), education for sustainability (3 times), and universities (3 times).

As for the words in the titles (Figure 5) of the 54 articles, the ten most frequent terms were sustainable (32 times), development (31 times), education (23 times), goals (23 times), university (23 times), SDGs (12 times), universities (11

times), sustainability (9 times), study (8 times), and implementation (6 times).

Figure 5
Word clouds of the abstracts, keywords, and title of the research portfolio



Source: Survey results (2022).

The approaches used by the authors

Studies on actions regarding the SDGs and their implementation in HEIs vary according to the objective, audience, and location of the study. However, there is a consensus when it comes to the standard techniques used, which depend on the research problems and objectives. We identified some of the most commonly used research techniques. Chart 2 shows the portfolio of these publications.

We analyzed 54 scientific articles, written by 211 authors and co-authors, which were distributed between 20 journals from 2015 to November 16, 2021. Articles from 2015 and 2016 were not selected because they did not meet the selection criteria. Out of the entire portfolio (54 articles), 55% (30 articles) used a qualitative approach, 35% (19 articles) adopted a quantitative approach, and 9% (5 articles) used both qualitative and quantitative approaches (Chart 2). The research strategy most used by researchers was case studies (24 articles). The main contributions of the articles include: providing a diagnosis (21 articles), presenting a framework (11 articles), offering recommendations (9), analyzing programs (such as seminars and courses) (8), using university rankings for evaluation (3), and conducting bibliometric analysis (2).

Chart 2

Portfolio of articles that make up the research corpus: research approach

No.	Authors	Approaches
30	(COSTA et al., 2021); (STUKALO; LYTVYN, 2021); (SHABALALA; NGCWANGU, 2021); (MAWONDE; TOGO, 2019); (TOGO; GANDIDZANWA, 2021); (HAUSER; RYAN, 2021); (MARTÍNEZ-VIRTO; PÉREZ-ERANSUS, 2021); (EZQUERRA-LÁZARO et al., 2021); (VÁZQUEZ-VERDERA et al., 2021); (FAHIM et al., 2021); (PRANDI et al., 2021); (WUBAH et al., 2021); (NELLES et al., 2021); (HÜBSCHER; HENSEL-BÖRNER; HENSELER, 2021); (DALLA GASPERINA et al., 2021); (HANSEN; STILING; UY, 2021); (BEDOYA-DORADO; MURILLO-VARGAS; GONZÁLEZ-CAMPO, 2021); (WEYBRECHT, 2021); (ADHIKARI; SHAH, 2021); (ELMASSAH; BILTAGY; GAMAL, 2021); (CHANKSELIANI; QORABOYEV; GIMRANOVA, 2021); (LEAL FILHO, 2020); (PURCELL; HENRIKSEN; SPENGLER, 2019); (LEAL FILHO et al., 2019); (MAWONDE; TOGO, 2019); (FRANDOLOSO; REBELATTO, 2019); (PALETTA; BONOLI, 2019); (TORABIAN, 2019); (GOODALL; MOORE, 2019); (OWENS, 2017)	Qualitative
5	(LEAL FILHO et al., 2021); (POZA-VILCHES et al., 2021); (MARTÍNEZ CASANOVAS; RUÍZ-MUNZÓN; BUIL-FABREGÁ, 2021); (CÁMARA; FERNÁNDEZ; CASTILLO-EGUSKITZA, 2021); (MORI JUNIOR; FIEN; HORNE, 2019)	Qualitative and Quantitative
19	(ALAWNEH et al., 2021); (PIZZUTITO; VENEZIA, 2021); (ERAUSKIN-TOLOSA et al., 2021); (PRIETO-JIMÉNEZ et al., 2021); (DE LA POZA et al., 2021); (IVKOVIC; MCRAE, 2021); (TAMRAT, 2021); (ALOMARI; KHATAYBEH, 2021); (ARAS; KUTLU FURTUNA; HACIOGLU KAZAK, 2021); (MURILLO-VARGAS; GONZÁLEZ-CAMPO; BRATH, 2020); (SMANIOTTO et al., 2020); (IBÁÑEZ et al., 2020); (KIOUPI; VOULVOULIS, 2020); (SAITUA-IRIBAR; CORRAL-LAGE; PEÑA-MIGUEL, 2020); (ZHU; ZHU; DEWANCKER, 2020); (PEROVIĆ; KOSOR, 2020); (CHANG; LIEN, 2020); (KÖRFGEN et al., 2018); (OMISORE et al., 2017)	Quantitative

Source: Survey results (2022).

Considering the higher incidence of the qualitative approach and the case study research strategy, Chart 3 presents the main results of the exploratory studies where the analyzed HEIs are

located, considering the factors that influence the implementation of the SDGs (whether exogenous or endogenous).

Chart 3

Main exploratory studies of the portfolio

Country	Factors influencing the implementation of the SDGs	References
Zimbabwe	Drivers: innovation centers; university knowledge (know-how); student participation; Barriers: lack of adequate skills; lack of resources; lack of cooperation from others; not knowing what steps to take; and the belief that it is the government's duty to act.	(TOGO; GANDIDZA NWA, 2021)
Spain	Drivers: collaboration, training, pedagogy, and systemic policies; Barriers: lack of awareness of the SDGs; lack of confidence in the possibility of achieving them; lack of incentive for interdisciplinary and multi-stakeholder collaboration; lack of institutional support.	(EZQUERRA-LÁZARO et al., 2021)
Ukraine	Drivers: Ukrainian HEIs understand the importance of considering the SDGs in their policies; Barriers: this understanding is not consistently activated in policies and strategies and often does not lead to practical implementation.	(STUKALO; LYTVYN, 2021)
United States	Drivers: philanthropic donations, networks and collaborative action, stakeholder commitment and responsibility, group action, diagnosis, and problem-solving; Barriers: lack of funding and human capital; lack of training and mentorship; reduced visibility and lack of access to networks; regional disparities and knowledge gaps.	(WUBAH et al., 2021)
Thailand	Drivers: university policies, faculty awareness, curricula, research, sustainability reports, and partnerships on SDGs; Barriers: lack of understanding about SDGs; resistance from Thai academics that are strictly focused on their own disciplines: low prestige of agricultural education by parents and students; many university administrators not interested in sustainable agriculture; bureaucratic rules and regulations; and lack of solidaction; plans that include or prioritize sustainable agriculture.	(NELLES et al., 2021)
Brazil	Drivers: discussion about the university's role in taking actions that directly affect the implementation of policies that meet the SDGs; training of professionals who meet the SDGs through their conceptions and practices in society; Barriers: various environmental actions already adopted by the university are still disjointed (IDP, Social Responsibility Policy and Institutional Environmental Policy).	(FRANDOLOSO; REBELATTO, 2019)

Source: Research results (2022).

"Barriers" are the factors that prevent the progress or realization of actions related to the

implementation of the Agenda. On the other hand, "drivers" are the strengths of the organization that enable or promote the achievement of certain actions in the institution (Budihardjo et al., 2021; Pickton & Wright, 1998).

Although the scenario of each country is very different (Chart 3), it is possible to observe that among the main barriers identified in the implementation the SDGs are: lack of resources; lack of adequate skills; lack of cooperation; and not knowing what steps to take. On the other hand, the drivers for the implementation of the SDGs include: collaboration; capacity building; pedagogy and policies; influence of key individuals on policies; regulations, and support from funding agencies.

Raising awareness and ensuring that everyone on the University campus knows what the Goals are and why they are important are essential in this journey, despite the countless possibilities and different contexts involving the subject, as was noted in the research portfolio. Other actions proposed by the researchers featured in this study are: including the SDGs in the curriculum, promoting debates and events to foster awareness, and discussing a governance framework for the Goals.

Final considerations

Higher education institutions (HEIs) play an important role in achieving Sustainable Development Goals (SDGs). How they are dealing with this demand is an open question. This study aimed to conduct a bibliometric analysis and identify actions and approaches used in research on the implementation of the SDGs in HEIs.

We analyzed 54 articles published in the Scopus database between 2015 and November 16, 2021. Based on the research results, the study on the SDGs topic allowed both: the comprehension of the experiences and behaviors of individuals associated with HEIs for the implementation of the Goals in their institutions and the learning opportunities that the Agenda proposes.

Furthermore, it is worth noting that education

for sustainability is increasing in HEIs all over the world, with a special focus on students' behaviors, organization of events and project development, highlighting that research in the area is descriptive and not empirical. The majority of the publications in the research portfolio adopt a qualitative approach and employ the case study method.

Publications on the subject increased, especially in the final year of analysis (2021). This indicates that actors in these institutions are concerned about achieving the SDGs since the Goals should be met by 2030, and therefore there are 8 years left to achieve them.

Researchers of the topic in various institutions have conducted an institutional diagnosis to plan actions that focus on the SDGs and the implementation of the 2030 Agenda. University rankings, such as the Times Higher Education Impact Ranking and the UI GreenMetric World University Rankings, contribute to such diagnosis, as they enable comparison and the possibility of benchmarking with other HEIs and other partners.

However, we warn that a sustainability policy or strategic planning alone will not generate results. We need to take action and engage students, teachers, and University staff in this process. In this regard, cooperation was seen as both a barrier and a drive in the practices of the HEIs analyzed. The implementation and execution of the SDGs should not be a verification exercise, but a tool to integrate a culture of sustainability in institutions. These latter, in turn, need to consider communicating the results of efforts towards sustainability and the SDGs at HEIs. Sustainability reports such as the Global Reporting Initiative can be an option.

Strengthening the means of implementation and revitalizing the global partnership for sustainable development is also Goal 17 (establishing partnerships and means of implementation) of the Agenda. HEIs are key spaces for this, whether through teaching (training human capital), research (socializing knowledge), or, above all, outreach (connecting with the

community). Achieving the SDGs requires commitment from everyone at all levels.

One of the limitations of this study lies in the single database used, in this case, Scopus (Elsevier). For future research, we suggest using other databases, such as the CAPES Journal Portal. We also recommend a comparative study of the implementation of the 2030 Agenda in HEIs per country, especially in Brazil.

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