

Original Article

Sustainability in higher education institutions: analysis of academic publication linked to management

Sustentabilidade em instituições de ensino superior: análise de publicações acadêmicas relacionadas à gestão

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Abstract

Purpose: To analyze and discuss how the topic of sustainability is addressed in higher education institutions (HEIs) in publications linked to the area of management.

Design/approach/methodology: To meet the proposed objective, a bibliometric review was developed based on a qualitative analysis in order to investigate implicit or explicit references to the way sustainability is discussed in academia.

Results: It appears that, although the importance of HEIs in the formation of a sustainable social mentality is well established in theoretical and practical debate, their role portrayed in studies still seems modest and diffuse.

Research limitations/implications: The main limitation of this study refers to the restriction of the results found, as they are based on a selection and the delimitations and methodological choices of the research found in the bibliometric review.

Originality/value: In addition to the relevance of the theme, this study allows a panoramic view of how sustainability is being approached in higher education institutions, as these are important agents that form and guide sustainable development in society. The study also has practical value, as the inferences found can support and direct managers' decision-making in favor of the inclusion of sustainability in academia.

Keywords: Sustainability; University; Management courses

Resumo

Finalidade: Analisar e discutir como o tema da sustentabilidade é abordado em instituições de ensino superior (IES) em publicações articuladas com a área de administração.

Design/abordagem/metodologia: Para atender o objetivo proposto foi desenvolvido uma revisão bibliométrica, a partir de uma análise qualitativa, a fim de se investigar referências implícitas ou

explícitas à forma de discussão da sustentabilidade no meio acadêmico.

Resultados: Constata-se que, apesar da importância das IES na formação de uma mentalidade social sustentável estar bem estabelecida no debate teórico e prático, a atuação delas retratadas nos estudos ainda parece modesta e difusa.

Limitações/implicações da pesquisa: A principal limitação deste estudo se refere a restrição dos resultados encontrados, pois partem de um recorte e das delimitações e escolhas metodológicas das pesquisas encontradas na revisão bibliométrica.

Originalidade/valor: Além da relevância da temática, este estudo permite uma visualização panorâmica de como a sustentabilidade está sendo abordada nas instituições de ensino superior, visto que estas são importantes agentes formadoras e orientadoras do desenvolvimento sustentável na sociedade. O estudo também tem um valor prático, já que as inferências encontradas podem sustentar e direcionar a tomada de decisão dos gestores a favor da inclusão da sustentabilidade no meio acadêmico.

Palavras-Chaves: Sustentabilidade; Universidade; Cursos de gestão

1 INTRODUCTION

The diffusion of the idea of sustainability came about from the perception of the need to avoid a worldwide environmental crisis resulting from human action. From the 1950s onwards, environmental movements took shape and the theme became institutional, with the United Nations (UN) guiding the actions and the debates in this sense. The definition of sustainability is established within this framework, which points to a development capable of satisfying the current generation's needs, without compromising the future ones (Nascimento, 2012).

Assuming three dimensions, sustainability embraces environmental, economic, and social issues and, thus, implies a change in attitude towards natural resources. According to Beuron et al. (2020), universities have a great responsibility in the process of awareness and behavioral change in society based on their teaching practices. Abdulghaffar and Williams (2021) reinforce the same idea and state that educating academic staff and students on how to improve environmental practices is part of the strategy for sustainable development.

Gholami et al. (2015) affirm that higher education institutions play a fundamental role in the formation of a sustainable organizational mindset and suggest that the stimulation of sustainable attitudes begins through efficient communication with

university students. On the other hand, Koch et al. (2013) state that the need for HEIs to act occurs as university students become decision-makers and that, therefore, they must be able to deal with solving socio-ecological problems.

Thus, initially, a study was elaborated to review the academic production on sustainability in management courses, considering the impact that this training area could generate in the organizational world. However, the methodological choices adopted when collecting data generated questions and this study was repositioned. The main one was the non-significant number of publications on sustainability in business courses/schools, considering the terms searched in the Web Of Science (WOS) and Scopus databases. Thus, a broader view was chosen, including the concept of university management or sustainability operational management within universities as relevant elements for this study, so that the new research objective became analyze and discuss how the topic of sustainability is addressed in higher education institutions (HEIs) in publications linked in some way to the administration area.

To achieve the proposed objective, a descriptive qualitative methodology was carried out, in which a bibliographic review was developed to seek implicit or explicit references to the approach of sustainability in Higher Education Institutions. It is worth highlighting here that HEIs differ from universities by their type of organizational and operational structure. However, for this work, both HEI and universities would be equally satisfactory. Thus, searches were made with the two terms: "*higher education*" and "*universit**", as explained in more detail in the method section.

In addition to the introduction, this study is divided into four sections. The following section presents the literature review on the topic of sustainability and its interface with the academic field. Subsequently, the adopted methodological aspects for the study are discussed, followed by the presentation of the results in the third section, and finally, the concluding remarks are provided.

2 SUSTAINABILITY AND ITS INCLUSION IN HIGHER EDUCATION

The theme of sustainability has inspired a wide debate that starts in the ecological field, flows through the economic sphere, and ends up in the social dimension. The historical path that developed and constructed the meanings of the term “sustainability” is broadly presented and discussed in the literature, and it shows the relationship between the institutional perception and the academic approaches. This path includes the important contributions of the international events all over the years and decades, as well as the theoretical insights to better comprehend and work with the complexity of sustainability.

In this context, the most popular definition of sustainable development emerges, which brings the idea of meeting the needs of the current generation without compromising the future generation and their needs (WCED, 1987). Magliacani and Sorrentino (2021) argue that, from the beginning, sustainability has been linked to the concept of development, pointing to a path in which the needs of the present are met without, however, threatening the ability of future generations to satisfy their own.

As the debate widened, the concept that sustainable development has three dimensions: environmental, economic, and social was defined. The environmental dimension conceives the idea of a production and consumption model that guarantees the ecosystem’s self-repair. The economic dimension, in turn, assumes the so-called eco-efficiency, which points to a technological advance capable of making us independent from the use of finite natural resources. The social dimension, resulting from the combination of the first two, calculates that all men have what is necessary for a life considered to be “decent” (Elkington, 1994, 2001; Henriques & Richardson, 2004; Nascimento, 2012).

Nascimento (2012), however, goes further. For the author, political and cultural dimensions must be highly considered, since moral and intellectual changes pass through the political and cultural spheres. At this point, the discussion on sustainability becomes one of the responsibilities of higher education institutions (HEIs), considering, according to Brandao et al. (2019), that they are participants in society and a reference in terms of knowledge, which, according to Beuron et al. (2020), have the power to

provoke a behavioral change in society as they discuss sustainability and insert the theme in its teaching practices, curricula, and research.

Supporting Leal Filho et al., (2019), universities and higher education institutions are also being called upon to provide pathways for promoting sustainability and implementing the 2030 Agenda, the main global framework for sustainable development developed by the United Nations (UN), which includes 17 goals and 169 targets to be achieved by 2030. According to Serafim and Leite (2021), the role of universities as social institutions has evolved over time. Initially, they were focused on education, then they took on a knowledge creation role (research), and subsequently acquired a third mission, extension. Therefore, the presence of sustainable development in all these functions seems crucial.

Several authors reinforce the importance of the actions of HEIs in the formation of a sustainable mentality. However, they also reinforce the idea that despite this being a notorious fact and already established in the debate, HEIs have played little – and sometimes poorly – their role. Beuron et al. (2020) state that the performance of HEIs in this sense has been unsatisfactory. Abdulghaffar and Williams (2021), on the other hand, point out how confused they have been, and Mader, Scott and Abdul Razak (2013) state that the performance deficiency of the academic world on sustainability occurs due to a lack of leaders in the area and the very lack of understanding on the subject.

Thereby, it is observed that the literature points to HEIs as important agents for the construction of a sustainable developed society, but that, on the other hand, their performance has been disproportionate to the responsibility they have, which makes it possible to conclude that there is a need to improve the discussion and approach to sustainability in higher education courses.

It is also important to note that, as Koch et al. (2013), the role of HEIs goes beyond awareness. According to the authors, as university students become decision-makers, universities must enable them to detect socio-ecological problems and judge potential solutions. This need is highlighted when one considers that numerous managers who lead organizations emerge from the academic world.

Adding to the reasons why sustainability should be addressed and practiced by HEIs, Mader, Scott and Abdul Razak (2013) pointed out in their work that the market has shown a growing demand for “*sustainability literate*” professionals, that is, literate in sustainability, ready to work and able to deal with changing scenarios. Hence, knowing this need of the job market and the demands of the contemporary world, how are HEIs responding to these demands? What is the role of management (of the HEI, university, course)? This study seeks to investigate how this approach is carried out through a bibliometric review, whose procedures are detailed in the next section.

3 METHODOLOGY

The present study aims to identify and analyze how sustainability is addressed in higher education institutions (HEIs) through publications in the field of administration.

In this regard, the developed study is characterized by its methodological aspects as descriptive, with a qualitative approach. For operationalization purposes, it was carried out through a bibliometric research.

The search for publications for bibliometrics was conducted in the Scopus and Web of Science (WOS) databases, from the Institute for Scientific Information (ISI).

For this bibliometric study, the following strings were used:

- (TITLE (sustainab*) AND TITLE (management) AND TITLE (universit*)) AND (LIMIT-TO (DOCTYPE ,»ar”));

- (TITLE (sustainab*) AND TITLE (management) AND TITLE (higher AND education)) AND (LIMIT-TO (DOCTYPE , «ar”)).

We chose to use the asterisk in “sustainab*” to capture variations such as sustainability and sustainable, and “universit*” to capture both the university and universities variations. It was decided to address only the title because the terms chosen for the search can easily be used in other areas outside the scope of this study. In addition, it is unlikely that a study in this area will be published without such terms in the title. By focusing the search only on the “TITLE” field, it is intended that the

results obtained are directly aligned with the main focus of the bibliometric study, avoiding the inclusion of articles that, despite containing relevant keywords in other components, are not directly related to the central theme.

To make the study more consistent and precise, the data search was limited to scientific articles only. Scientific articles generally have a rigorous peer review process before publication, which guarantees a certain standard of quality and reliability of the data and information presented. For a complete overview, no time period was selected in the data search, so all the identified works were considered without a temporal limit.

As already mentioned, Scopus and Web of Science (WOS) bases were chosen. In the Scopus database, the search with the first string brought back 64 articles, and with the second, 42 articles. In the WOS database, the first string resulted in 47 articles and the second 35. The two bases with the two strings totaled a result of 188 articles.

The first cutting step was for duplicate, triplicate, or quadruplicate articles, those whose titles could imply that they were not the subject of this study or even the rare documents that were not articles and are classified as such within the database. After this cut, 98 articles resulted in a more detailed screening.

In the analysis of abstracts, articles that were distant from the subject of the research were removed, resulting in 55 articles. A previous analysis of these articles was made with the aid of the software *VOSViewer* and Microsoft Excel.

The research corpus included 55 works that were analyzed in terms of the authors' productivity and the thematic predominance of the work's discussions. The surveys were arranged in an Excel spreadsheet to extract their main elements such as authorship, year of publication, keywords, etc.; and, later, the material was inserted into the software *VOSViewer* to generate the maps that supported the analyzes discussed in the following topic.

After this preliminary analysis, all articles were read in their entirety and other information was extracted, also recorded in an Excel spreadsheet.

4 RESULTS

The analysis carried out from the works collected and worked on in the software *VOSViewer* and Microsoft Excel was divided into two aspects: descriptive and thematic. The descriptive analysis aimed to characterize the research corpus, and the thematic aspect, to identify the interest of researchers in the area when approaching the themes of sustainability and higher education in their articles.

5 CHARACTERIZATION OF THE RESEARCH CORPUS

Through the obtained results, it was possible to identify that scientific production on sustainability in higher education institutions has been leveraged since 2010. Figure 1 shows that until that year only 3 researches were developed, among which the work from author Angelo Nicolaidis (2006), which demonstrated that practices, processes, and courses within the university environment must be aligned to meet demands related to sustainability, and stakeholders need to be aware of the actions.

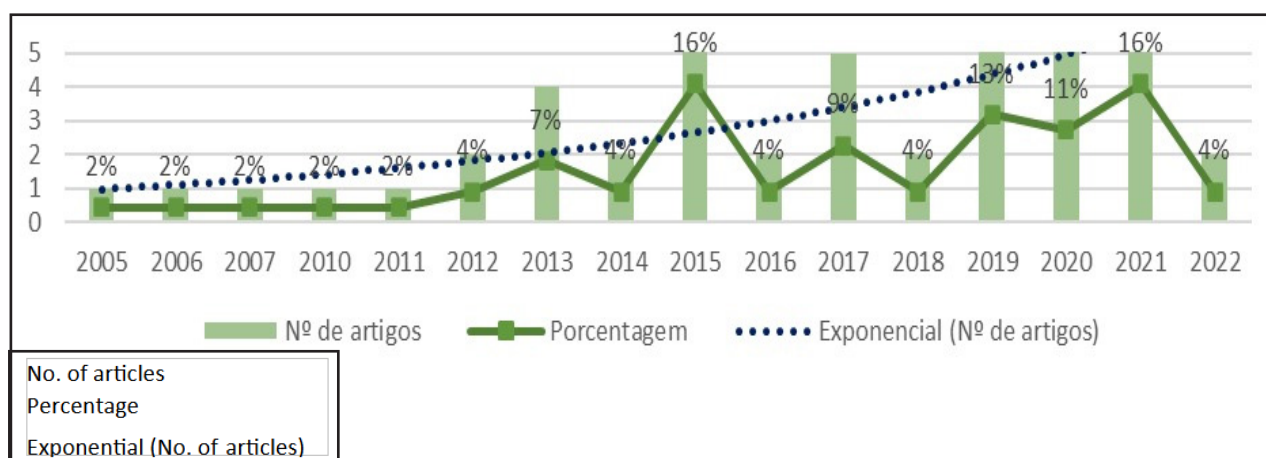
Between 2010 and 2014, 10 pieces of research were produced, among them that of the researchers Koch et al. (2013), which provides a study of university students' understanding of environmental management, indicating the gaps in this understanding and highlighting the need for education to take resource management into account. The authors point out how many university students become decision-makers and that, therefore, they need to develop cognitive skills to solve problems of conservation and sustainable use of biological resources.

The work of Mader, Scott and Razak (2013) also stands out in this period, which points out that among the reasons for the existing deficiency in the execution of the role of HEIs in terms of sustainability is the absence of leaders to advocate and respond for the area, beyond the limited understanding of what sustainability means. Thus, the authors argue that good ideas can be wasted if there is an incorrect understanding of

how to implement them. From this standpoint, the authors conclude that the necessary change must be led with an awareness of where it is intended to go.

The period of highest production, however, started in 2015. The last seven years accounted for 76% of the articles in the corpus, with the years 2015 and 2021 being the most productive, as can be seen in Figure 1.

Figure 1 – Production over time



Source: Own research

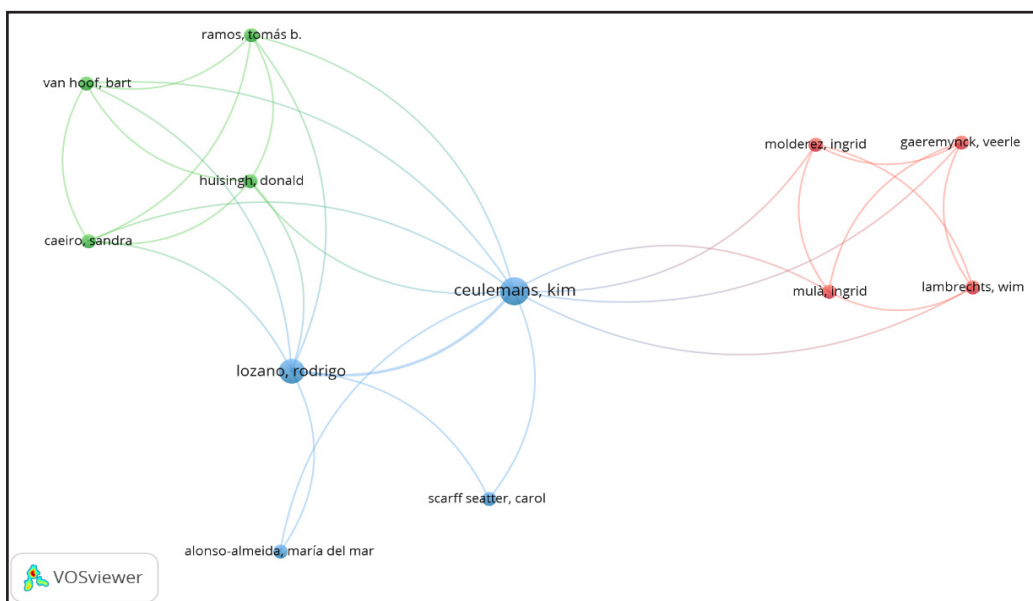
Among the productions between 2015 and 2022, Brandao et al. (2019) stand out. The authors argue that the first step towards establishing environmental management on campuses is to structure a plan focused on sustainability, with real practices of sustainable energy management and purchases of inputs. The authors also point out that there are challenges to be overcome, such as the “theoretical-conceptual” structuring of the environmental management system and the collection and allocation of financial resources. Another highlight from 2019 is the research of Mendoza, Gallego-Schmid and Azapagic (2019), who built a checklist with guidelines for the implementation of economic-sustainable strategies.

Finally, among the 22 studies produced in the last 3 years, which corresponds to 40% of the research corpus, the work of researchers Abdulghaffar and Williams (2021) stands out, who reaffirm the fundamental role of HEIs in raising awareness

about sustainability and conclude that the formulation of strategies for sustainable development in HEIs includes the education of staff and students on procedures necessary for best environmental practices. The dotted line in Figure 1 indicates the production trend, pointing to a growing number of works in this thematic area.

Starting with an analysis of authorship, it was observed that the production was quite decentralized, according to the map in Figure 2 generated by the *VOSviewer*, with most authors, equivalent to 98% of the corpus, producing only 1 article and the maximum number of articles per author being equal to 4. The corpus, composed of 191 authors and co-authors, presented an elite of research (Araújo, 2006) of 14 authors, who produced the equivalent of 10% of the corpus, as shown in Table 1.

Figure 2 – The relationship between authors and co-authors



Source: Own research

Decentralization was also confirmed in the analysis of journals. The corpus presented 55 different journals, 5 of which were responsible for 56% of the productions and the others had only one published work.

Table 1 – Research elite

Reseaech Elite Authors	Qty Documents	%
Ceulemans, Kim	4	2.1%
Lozano, Rodrigo	3	1.6%
Williams, I. D.	2	1.0%
Amorim, Wellynton Silva de	1	0.5%
Andrade de Lima, Maurício	1	0.5%
Andrade Guerra, José Baltazar Salguerinho Osório de Andrade	1	0.5%
Conceição, Diogo	1	0.5%
Fuchs, Paulo	1	0.5%
Montenegro de Lima, Carlos Rogerio	1	0.5%
Neiva, Samara	1	0.5%
Raulino, Carlos	1	0.5%
Soares, João Coelho	1	0.5%
Soares, Thiago Coelho	1	0.5%
Anholon, Rosley	1	0.5%
	20	10%

Source: Own research

6 THEMATIC ANALYSIS

To investigate the areas of interest of the researchers gathered in the corpus, an analysis of the research objectives was carried out, which allowed us to conclude that most of the research was dedicated to analyzing and discussing the ways of approaching and implementing sustainability in HEIs and that the others suggested the development of strategies for better sustainability management in universities and case studies, as shown in Table 2.

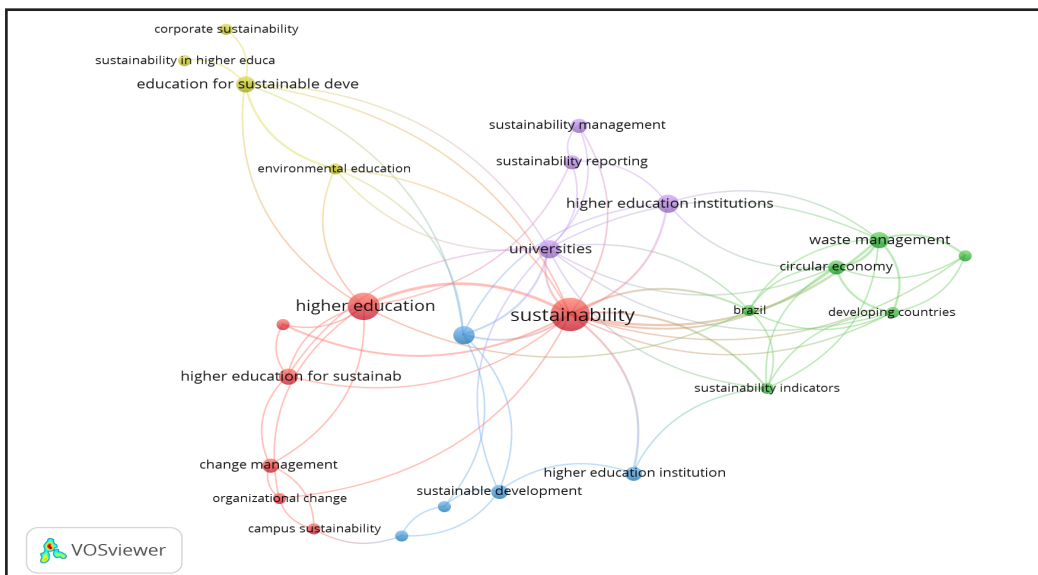
Table 2 – Research objectives

Objective	Freq.	%
1. Analyze and discuss ways of approaching and implementing sustainability in HEIs	40	73%
2. Develop strategies to implement sustainability in HEIs	7	13%
3. Present case studies in HEIs, taking into account environmental issues	8	15%
	55	100%

Source: Own research

With the help of the software *VOSViewer*, the possible themes of the research gathered in the corpus were mapped. In the maps generated by the software, it is possible to detect the frequency of occurrence, the strength of relevance, and the relationship that the keywords of the works have with each other. The occurrence and relevance can be perceived by the size of the nodes of each word since the relationship between them is given by proximity. Figure 3 shows that the keywords of the corpus research formed 5 clusters, differentiated by colors. The red cluster has the greatest strength and includes the terms with the highest occurrence in the corpus: “sustainability” and “higher education”. The terms “universities”, “environmental management” and “higher education institutions” also stand out in terms of their occurrence and relevance, which confirms the researchers’ intention to investigate the relationship between sustainability and higher education.

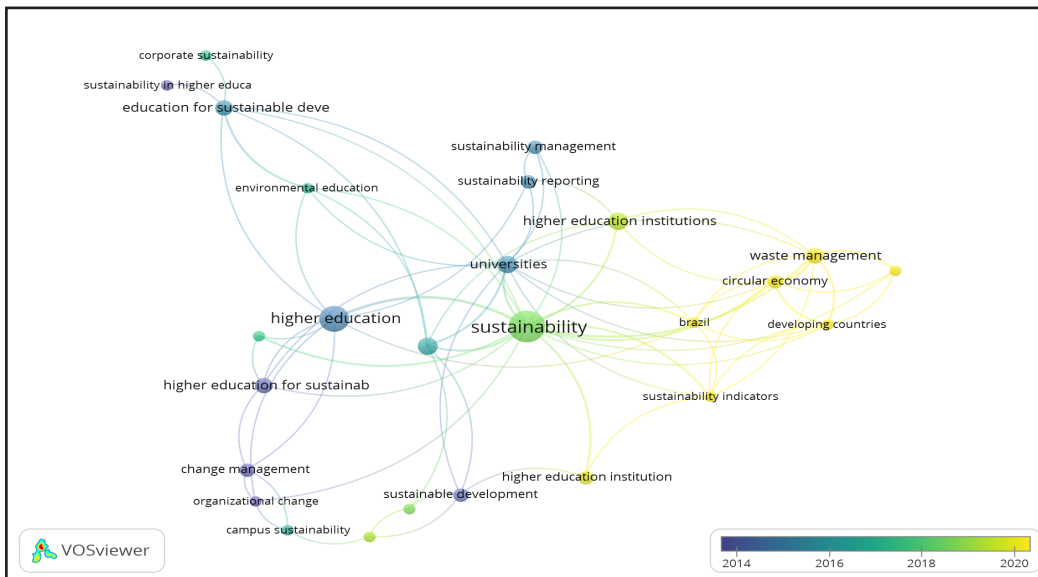
Figure 3 – Keyword network



Source: Own research

Figure 4 also shows that in the last 3 years – the most productive – research focused on waste management, circular economy, and sustainability indicators and that Brazil was among the discussions.

Figure 4 – Keywords in time



Source: Own research

It is worth noting that 36 of the 55 articles discussed sustainability on campus, 30 involved teaching/learning practices, 16 also addressed research carried out within the scope of the HEI/university, 18 captured sustainability experiences linked to contact with the community (Community outreach), and 20 entered the field of sustainability as a university strategy. These numbers consolidate the information in Figures 3 and 4, as the most evident keywords are linked to sustainability on campus or the operationalization of sustainability practices. At the same time, this relationship shows that the works found and chosen for this bibliometric study demonstrate that the studies are dispersed in terms of possible themes. This may reflect that the articles stopped contemplating the practices that HEIs do to contemplate a more focused objective; or that the practices of HEIs are still fragmented, without considering sustainability on campus, in teaching, in research, and in contact with the community as a holistic process.

Finally, it is also important to point out that only 11 of the 55 articles discussed sustainability practices in business schools/administration courses. Thus, even if relevant participation of administration courses (20%) was detected, it is clear that

most of the studies present other forms of sustainability management within HEIs, which is the main meaning of the word “management” in the strings of this study.

7 FINAL CONSIDERATIONS

This work aimed to investigate how sustainability is approached in higher education institutions. For this, 55 academic works were gathered and analyzed qualitatively, with the help of bibliometric software, to perceive implicit or explicit references to the approach to the theme in universities.

The results showed, firstly, that the topic gained strength in academic discussion from 2005 onwards, intensifying in the last seven years and tending to develop even more in the coming years. The production, however, proved to be decentralized, with little interaction among the authors.

In terms of thematic analysis, it was noticed that most of the works were also focused on understanding how sustainability is discussed and implemented in HEIs. It also verified the objective of elaborating strategies for implementation and sustainable management, in addition to the development of case studies in specific institutions to understand the way sustainability or developing strategies work for better environmental management.

The general consideration of the works gathered in the corpus is that, despite the theoretical/practical debate highlighting that they are important agents in the construction of a sustainable mentality in society, the performance of the HEIs portrayed in the studies seems modest and diffuse. However, this inference is based on the cut made by the methodological choices of this study and by the methodological cut of the research found in the bibliometric review. If other choices had been made for the strings and different decisions had been made in the cuts, or even if other bases had been addressed, other results could emerge and other conclusions could be drawn.

It is suggested that future studies should consider alternative methodological choices and approaches, expand the dataset to include additional scientific databases, and further deepen qualitative analyses.

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1. Definition of research problem	√	√	√	
2. Development of hypotheses or research questions (empirical studies)	√			
3. Development of theoretical propositions (theoretical work)	√			
4. Theoretical foundation / Literature review	√			
5. Definition of methodological procedures	√	√	√	
6. Data collection	√			
7. Statistical analysis	√	√	√	
8. Analysis and interpretation of data	√			
9. Critical revision of the manuscript				√
10. Manuscript writing	√	√	√	√
11. Other (please specify)				

Conflict of Interest

The authors have stated that there is no conflict of interest.

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