

Sustainable Development Goals in Higher Education

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Abstract The idea of sustainable development is based on the balance of social, economic, and environmental aspects of the development, to make the world more equalitarian, healthy and fair. These issues originated the 2030 Agenda for Sustainable Development, signed by United Nations member states and focused on 17 goals. Through teaching, research and community outreach, higher education institutions play a central role in helping local and national governments and communities to achieve those goals. This paper presents a literature review to verify how the relation between higher education and the sustainable development goals has been established and to find out if there are any gaps in the research undertaken so far. Results confirm the relevance of the subject and identify future research opportunities in this field, also considering all learning that will be generated by the new global agenda. The analyzed papers highlight the importance of sustainability reporting and assessment for the institutions and show the need of integrating sustainability goals in the institutions' strategies. It is also shown that there is a lack of researches demonstrating how the institutions have been considering the sustainability goals in their strategic plans.

Keywords: Sustainability, Sustainable Development, Higher Education Institutions, Universities, Sustainability in Higher Education.

1 Introduction

The sustainability and sustainable development (SD) concepts can be interpreted in different ways (Maragakis and Van den Dobbelsteen, 2015; Urbanski and Leal Filho, 2015; Weisser, 2017) but, according to the United Nations Development Programme (UNDP, n.d.), SD must balance social, economic and environmental aspects. The different interpretations of sustainability and SD concepts happen because despite the relative consensus that the sustainability model is based on a three-pillar approach (environmental, economic and social), it may reflect different ways to address the relationship between humanity and the environment (Bizerril et al., 2018).

For the United Nations (UN) all the three aspects are equally important and were considered for the elaboration of the 2030 Agenda for Sustainable Development, which was signed by the Member States in 2015. This Agenda is a plan of action for people, planet and prosperity (UN, 2015). At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries (UN, 2019).

As a result of this global agreement, countries and organizations have been committing to achieve the SDGs. It could not be different to universities and other higher education institutions (HEIs). These institutions have a fundamental role fostering the SD in their local communities and countries (McCowan, 2016; Owens, 2017; Ramísio et al., 2019; Sonetti et al., 2019).

The present study aims to verify how the relation between HEIs and SDGs has been established and to find out if there are any gaps in the research undertaken so far. The paper is divided in five sections as follows. Section 2 brings an overview about how sustainability has been treated in the context of higher education (HE). Section 3 presents the method applied to conduct the literature review. Section 4 presents and discusses the results of the review. Section 5 concludes the article.

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2 Higher Education and the Sustainable Development Agenda

According to UNESCO (2019), besides being in one of the targets of the SDG about education (SDG4), HE is also an important part of other goals related to poverty; health and well-being; gender equality; decent work and economic growth; responsible consumption and production; climate change; and peace, justice and strong institutions.

To face these challenges, besides administrative and operational efforts, HEIs must focus on fully developing all three educational missions: teaching and learning, scientific research, and community outreach (Owens, 2017). That translates to approach sustainability through four main realms: sustainability-focused education and teaching, sustainability-focused research, campus operations and environmental management and community engagement around sustainability issues (Bessant et al., 2015).

To verify the progress of the mission, the research about SD in HEIs has mostly focused attention on sustainability and managerial reports and on the sustainability assessment tools. Scholars believe that reporting and assessing could help HEIs to define the best policies to their SD strategy and to get better results in the future (Alba-Hidalgo et al., 2018; Berzosa et al., 2017; Cronemberger de Araújo Góes and Magrini, 2016; da Silva Junior et al., 2018; Drahein et al., 2019; Lozano, 2011; Maragakakis and Van den Dobbelen, 2015; Shi and Lai, 2013; Urbanski and Leal Filho, 2015). Studies also discuss the importance of planning activities. It is not enough to report and assess sustainable activities. Some authors point that proper planning has become highly relevant (Leal Filho, Skanavis, et al., 2019) and that SDGs should be fully integrated to the HEIs strategy (Berchin et al., 2017; Bieler and McKenzie, 2017; E. Akins et al., 2019; Hayter and Cahoy, 2018; W. Leal Filho et al., 2018; Walter Leal Filho et al., 2018; Lozano et al., 2015; Ramísio et al., 2019; Salvioni et al., 2017; Sepasi et al., 2019).

3 Methods

A literature review was chosen as the method to answer the question presented in section 1. To compose the set of articles used to the study, Scopus database (www.scopus.com) was defined as the research engine due to its popularity, usability and size. The search was carried out in April 2020 applying the terms shown in Table 1.

Table 1 Conditions applied to the Scopus research.

Research (in article title, abstract and keywords)	Results	Filters	Filtered Results	Selected abstracts	Selected articles
(SDG OR "sustainable development goals" OR sustainability) AND ("higher education" OR universit* OR colleg*)	17.510	Languages: PT, EN, ES, FR Year: 2015 and after Document type: article/ review Source type: Journals Subject area: Social Sciences; Business, Management and Accounting; Engineering, Multidisciplinary Keywords: Sustainability; Sustainable Development; Higher Education; University Sector; University; Developing World; Management; Brazil; Higher Education Institutions; SDGs; Universities; Government Sort on: Relevance (800 first results were considered)	2.817	163	60

Quotation marks were used to indicate that those full expressions were being searched. The asterisk was used to indicate that any combination of characters was accepted, i.e. the search for universit* could return documents with the words university or universities. Boolean operators were also used to specify what combination of terms was being searched.

The key terms were searched in titles, abstracts, and keywords, what resulted in 17.510 documents. The results were filtered by language, document type, year, source type, subject area, and keywords. Then, the remaining 2.817 results were sorted by relevance and the first 800 were considered. The following filter

was the reading of the articles' titles, excluding the ones with the weakest relation to the subject. 163 abstracts were selected and from that and submitted to a careful reading, then 60 articles were chosen. Other papers were included by the snowball method, resulting in a source of 66 documents.

The articles were organized in an excel table, where identification data of each article (author, title, journal, and year) was collected. Then it was generated a second table with all the keywords the most used ones were identified. Subsequently, all the abstracts were put together in a text file which was uploaded to the WordItOut online tool (<https://worditout.com>) in order to verify the most frequent words in the abstracts and to generate a word cloud. Then, the articles were read and divided by approach. Other data was also collected from the selected articles, as follows: journals where the articles were published; year of publication; sustainability definition; and countries where the studies were focused (when available).

4 Results and Discussion

As expected, Higher Education and Sustainable Development were the most used keywords in the studied articles. Fig. 1 shows the percentage of papers using each of the 15 most common keywords found in this research. Besides those, other 187 keywords were present in the articles.

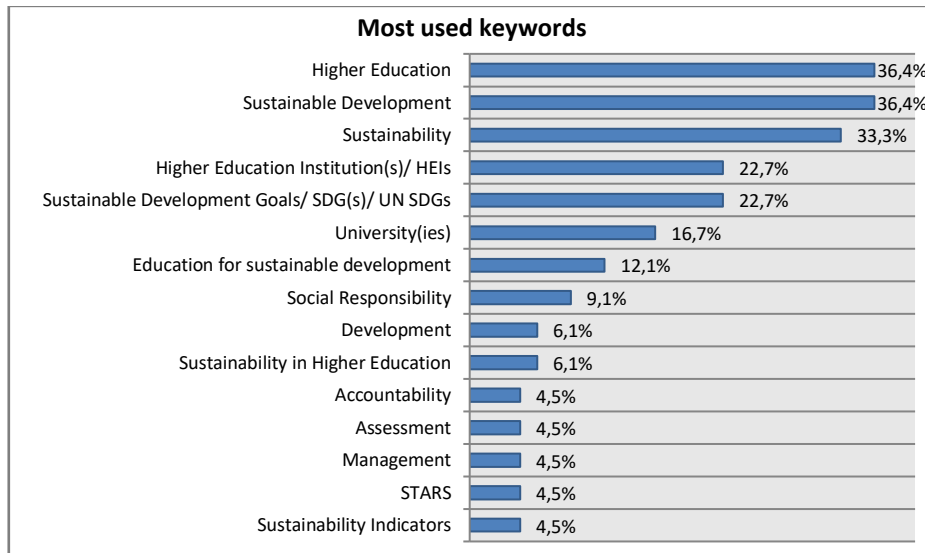


Fig. 1 Occurrence of the 15 most used keywords.

In the abstracts, sustainability was the most used word, as shown in Fig. 2, that presents a word cloud with the 50 most used words in the abstracts. In this image, the size of the words is proportional to their frequency.



Fig. 2 Word cloud with the most used words in the abstracts. Generated by WordItOut online tool (<https://worditout.com>).

Fig. 1 and Fig. 2 demonstrate the importance given to the evaluation of the HEIs performance, with a strong presence of words like indicators, reporting, results and assessment. The social function of the HEIs is also revealed as a significant aspect, given by the high occurrence of terms like change, impact, social and development.

The articles were divided in seven different approaches. As it can be seen in Table 2, most papers present case studies (21 documents) or discuss sustainability assessment tools (21 documents).

Table 2 Articles divided by approach.

Approach	Documents	Articles
Literature review	8	Bessant, Robinson and Ormerod, 2015; Puppim de Oliveira, Jing and Collins, 2015; Bizerril et al., 2018; Hayter and Cahoy, 2018; Findler et al., 2019; Franco et al., 2019; Sonetti, Brown and Naboni, 2019; Symaco and Tee, 2019
Presentation, use, test, or comparison of existing sustainability assessment tool(s)	10	Lozano, 2011; Maragakis and Van den Dobbelsteen, 2015; Urbanski and Filho, 2015; Bullock and Wilder, 2016; Cronemberger de Araújo Góes and Magrini, 2016; Berzosa, Bernaldo and Fernández-Sanchez, 2017; Alba-Hidalgo, Benayas del Álamo and Gutiérrez-Pérez, 2018; Drahein, De Lima and Da Costa, 2019; Parvez and Agrawal, 2019; Sepasi, Braendle and Rahdari, 2019
Proposition of a new assessment tool or improvement of an existent one	5	Shi and Lai, 2013; da Silva Junior et al., 2018; Zare Banadkouki et al., 2018; Silva and Almeida, 2019; Torabian, 2019
Sustainability assessment in HEIs using no specific tool	6	Lozano et al., 2015; Deus, Battistelle and Silva, 2016; Bieler and McKenzie, 2017; Moon, Walmsley and Apostolopoulos, 2018; Walter Leal Filho et al., 2018; Farinha, Caeiro and Azeiteiro, 2019
HEIs contributions to society	7	O’Keeffe, 2016; Owens, 2017; Radinger-Peer and Pflitsch, 2017; Withycombe Keeler et al., 2018; Mawonde and Togo, 2019; Purcell, Henriksen and Spengler, 2019; Xu et al., 2020
Sustainability implementation in HEIs assessment or report (case studies)	21	Barnard and Van der Merwe, 2016; Salvioni, Franzoni and Cassano, 2017; An, Davey and Harun, 2017; Berchin et al., 2017; Kolb, Fröhlich and Schmidpeter, 2017; Aleixo, Azeiteiro and Leal, 2018; Aleixo, Leal and Azeiteiro, 2018; Oyama, Pasquier and Mojica, 2018; W. Leal Filho et al., 2018; Leal Filho, Skanavis, et al., 2019; Leal Filho, Skouloudis, et al., 2019; Mori Junior, Fien and Horne, 2019; Paletta and Bonoli, 2019; Ramísio et al., 2019; Shawe et al., 2019; Veiga Ávila et al., 2019; Yáñez et al., 2019; E. Akins et al., 2019; Engelman et al., 2019; Filho et al., 2019; Goodall and Moore, 2019
Other	9	Lidstone, Wright and Sherren, 2015; Beynaghi et al., 2016; Boni, Lopez-Fogues and Walker, 2016; McCowan, 2016; Volchik and Maslyukova, 2017; Weisser, 2017; Dlouhá et al., 2018; Mahmud, Nasri and Abdullah, 2019; Zamora-Polo and Sánchez-Martín, 2019

The selected articles came from 29 different journals, however 62,1% (i.e. 41 papers) were published in four journals, what shows the importance of the subject to these periodicals. Journal of Cleaner Production has published 14 articles, followed by International Journal of Sustainability in Higher Education with 13 articles, Sustainability with 11 articles and Sustainability: The Journal of Record with 3 articles. The other 25 journals have published one of the selected articles each.

As explained in the previous section, just articles published after 2015 were considered in the Scopus search. Even with the later inclusion of older documents, it is possible to verify that the subject is a current topic and it has been strongly discussed during the last years.

Fig. 3 shows the number of articles per year. Giving the importance of sustainability discussions and the increasing number of publications per year, we can say the topic is a trend that may last for the next years. As the research was carried on in the first semester of 2020, only one article published in 2020 was selected to this study. That is why it was counted with the 2019 articles in Fig. 3.

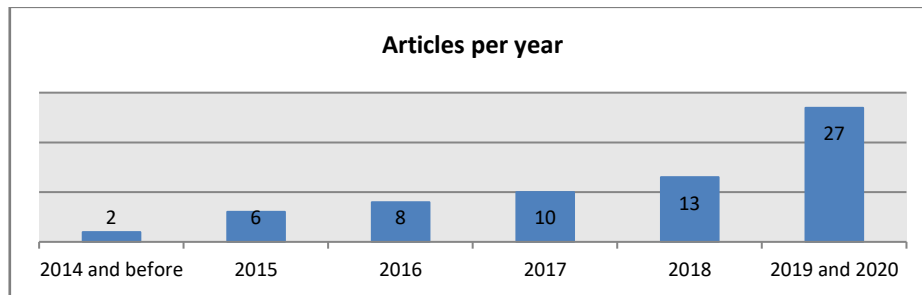


Fig. 3 Published articles in each year.

The sustainability concept has evolved during the years and it can vary accordingly to the understanding of who implements and discusses it. In this study, the articles were divided into two categories. The first one defines sustainability mostly or exclusively as environmental actions. The second one defines sustainability as the balance of environmental, social, and economic aspects. The analysis shows that most articles defined sustainability as a balance of environmental, social, and economic aspects (52 articles, or 78,8% of the total). There were 10 articles (15,2%) whose sustainability definitions were mostly connected to environmental aspect. Other 4 articles (6,1%) were not clear about the sustainability definition.

The selected studies reported cases from 37 countries, as illustrated in Fig. 4, which emphasizes the relevance of the subject.



Fig. 4 Countries studied in the articles.

The articles conclusions and main statements lead to seven central ideas that can summarize the relationship between HEIs and SDGs:

1. The SDGs are important tools to lead society and governments into solving humanity's biggest issues. Nevertheless governments face great challenges to reach these goals.
2. HEIs have a central role in helping countries and local communities to achieve the SDGs and should receive all kinds of support from governments, civil society and from other HEIs through networks, because developing HEIs contributes to global, national, and local development.
3. Despite the existence of the SDGs, the sustainability concept is fluid and HEIs can understand it in different ways. In some HEIs, SD is still seen almost exclusively by the environmental aspect.
4. Despite the implementation of SD in HEIs being compartmentalized throughout the institutions, the aspects of sustainability should be holistically integrated and the SDGs should be part of each HEI strategic plan, with top-down and bottom-up strategies working together.
5. Sustainability assessment is an important tool that can help institutions to work their policies and there is still room to develop new tools or to improve the existing ones.
6. Besides all the efforts and the decades of discussion, the implementation of SD oriented policies in HEIs is still new and the practices and reporting need to be developed and improved.
7. Planning has a central role in implementing sustainable practices and policies. That gives HEIs clear and measurable goals and guides their actions towards the SD.

The listed main ideas prove once more the relevance of discussing sustainability and the urge of all kinds of institutions to act and commit for the global achievement of the SDGs, especially HEIs, as indicated by UNESCO (2019) and demonstrated by all 66 papers.

The studies emphasized the importance of HEIs management to make the implementation of sustainability policies possible by planning, reporting, and assessing. The analyzed literature gave more importance to reporting and assessing activities, but it is also shown that is fundamental to integrate the institutional sustainability policies to the HEIs strategic plans (Bieler and McKenzie, 2017; Leal Filho, Skanavis, et al., 2019; Lidstone et al., 2015; Purcell et al., 2019; Torabian, 2019; Zare Banadkouki et al., 2018). The smaller number of papers dedicated to the analysis of the HEIs planning documents in comparison to the ones focused on assessment can be identified as a gap in the research about HEIs initiatives towards SD conducted so far.

5 Conclusions

Research has shown strong relation between HEIs and the SDGs and highlighted the relevance of the subject, since the 2030 Agenda is a global concern and HEIs play a key role helping society to achieve the SDGs, not only by educating people to face sustainability challenges, but also by providing technical solutions, supporting and promoting social changes to their communities and countries through management, teaching and learning, scientific research, and community outreach.

An evidence of the importance of HEIs sustainable initiatives is the variety of sustainability assessment tools and studies intending to improve them or to create new ones. But measuring the results is not the only way to value and encourage HEIs sustainability initiatives. The fulfillment of the universities role to promote SD will only be achieved when the SDGs become part of the HEIs strategy. That is a gap in the research about sustainability in HEIs, since not so many works focused on strategic planning for sustainability have been published in comparison with the number of studies focused on reporting and assessing sustainability.

Therefore, as this review results indicate, there is a possibility of future studies about the HEIs sustainability commitments in their strategic plans. Future research could also develop new tools to connect HEIs strategic plans to assessment tools and results in sustainability.

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