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# INTERNATIONAL SUSTAINABILITY INITIATIVES IN UNIVERSITIES: A BIBLIOMETRIC STUDY.

# INICIATIVAS INTERNACIONAIS DE SUSTENTABILIDADE NAS UNIVERSIDADES: UM ESTUDO BIBLIOMÉTRICO.

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**ABSTRACT**

Environmental, social and governance practices are relevant to all stakeholders in any business sector, including education, for demonstrating transparency in business. This raises curiosity about the existence, in the international Administration literature, of researches focused on the relationship, in universities and those practices. Bearing in mind that sustainable universities have been an important issue, when examining sustainability in higher education (SHE), particularly as it relates to raising awareness about the deterioration of the environment, more than 1,400 universities around the world have signed an SHE declaration.. Not only universities, but also companies that want to achieve sustainable development need to worry about several aspects: 1) economical, such as type and value of investment, smart products, and market presence; 2) Social, such as good business practices, sustainable consumption and social responsibility related to the safety of collaborators, *stakeholders* and communities; 3) Environmental, which relates to the life cycle of the product encompassing *design*, transport, raw materials for production, and recycling. As the first step in a larger investigation, this *conceptual paper* performs this mapping restricted to publications from the year 2021, through the triangulation between bibliometric research and literature review. The main objective of the present paper was to verify the state-of-the – art of international academic research – published in 2021-on sustainability in universities in published research regarding ESG, to identify any gaps that can be covered in a subsequent larger study. As a result, it was found that, in addition to being treated in isolation, those practices are not located in the educational segment, establishing *gap* that deserves attention.

**Keywords**: Sustainability, universities, ESG practices.

**RESUMO**

As práticas ambientais, sociais e de governança são relevantes para todas as partes interessadas de qualquer setor empresarial, incluindo o educacional, para a demonstração de transparência nos negócios. Isso suscita curiosidade sobre a existência, na literatura internacional de Administração, de pesquisas voltadas à relação, nas universidades e aquelas práticas. Tendo em vista, que as universidades sustentáveis têm sido uma questão importante, ao examinar a sustentabilidade no ensino superior (SES), principalmente no que diz respeito a alertar sobre a deterioração do meio ambiente, mais de 1.400 universidades em todo o mundo assinaram uma declaração SES. Não só as Universidades, mas também as empresas que pretendem alcançar o desenvolvimento sustentável precisam preocupar-se com diversos aspectos: 1) econômicos, tais como tipo e valor do investimento, produtos inteligentes, e presença no mercado; 2) sociais, tais como boas práticas de negócios, consumo sustentável e responsabilidade social com a segurança dos colaboradores, dos *stakeholders* e das comunidades; 3) ambientais, que dizem respeito ao ciclo de vida do produto englobando *design*, transporte, matérias-primas para a produção, e reciclagem. Enquanto primeiro passo de uma investigação maior, esse *conceptual paper* realiza esse mapeamento restrito a publicações do ano de 2021, por meio da triangulação entre pesquisa bibliométrica e revisão da literatura. O Objetivo principal do presente trabalho foi verificar o estado-da-arte da pesquisa acadêmica internacional – publicada no ano de 2021 – sobre

sustentabilidade nas universidades em pesquisas publicadas no que tange a ESG, para identificar eventual(is) lacuna(s) que possa(m) ser coberta(s) em estudo maior subsequente. Como resultado, verificou-se que, além de tratados isoladamente, aquelas práticas não são situados no segmento educacional, estabelecendo-se *gap* que merece atenção.

**Palavras-chaves**: Sustentabilidade, Universidades, práticas ESG.

## 1 INTRODUCTION

Since 2005, as it happens in the rest of the world, Brazilian investors tend to look for socially responsible, profitable and especially sustainable companies to apply their resources. Such applications, called socially responsible investments (SRI), approve sustainable companies, which create value for the shareholder in the long term and that in the face of environmental, social and economic risks, they will be more prepared to face them (ANDRADE *et al.*, 2013).

Motivated by this justification, in 2005, B3-an acronym for the Brazilian Stock Exchange, and which means "Brazil, Stock Exchange, Counter" - in partnership with other institutions[1], joined forces to create a stock index that was a reference for socially responsible investments: the Corporate Sustainability Index (ISE) (ANDRADE *et al*.., 2013). Prepared by the Center for Sustainability Studies of the Getúlio Vargas Foundation (CES-FGV), the ISE is composed of a portfolio of companies that responded to a questionnaire committing to develop corporate sustainability actions (SE). Such questionnaire is part of the concept called Triple Bottom Line, which includes the assessment of environmental, social and economic-financial elements in an integrated manner[2] (ANDRADE *et al.*, 2013).

Environmental, social and governance practices-represented by the acronym ESG, which stands for *Environmental*, *Social*, and *Governance*.- are meaningful to all stakeholders in any business sector. Good social and governance performance plays a significant role in reducing financial risk and strengthening banks ' commitment to good governance and environmental practices. If the risk is low, financial uncertainty decreases, which evidences the involvement of Corporate Social Responsibility (CSR).

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1 Brazilian Association of Pension Funds (ABRAPP), National Association of Investment Banks (ANBID), Association of Capital Markets Analysts and investment Professionals (APIMEC), Brazilian Institute of Corporate Governance (IBGC), International Finance Corporation (IFC), ETHOS Institute (created in 1999) and Ministry of the environment.

2 It should be noted that, although the creation of the Corporate Sustainability Index (ISE) occurred in 2005, one of the first organizations to promote social and/or environmental performance in organizations was the Brazilian Institute for Social and Economic Analysis (IBASE), created in 1997.

There is a need for higher education institutions (HEIs) to generate reports that highlight practices on environmental, social and governance dimensions, considering that higher education institutions have been recognized as critical for the change towards sustainable development (WASS *et al*.., 2010; SHEPHARD, 2010). Similarly, since Agenda 21[3] and since the United Nations published the United Nations Decade of Education for Sustainable[4] Development Initiative, higher education institutions have been recognized as playing a critical role in raising awareness for Sustainable Development (LEE *et al*.., 2013).

Lack of transparency can lead companies to compromise their business with civil society. An important tool for companies to demonstrate the transparency of their business is sustainability reporting. That is, it is a form of diverse *players* - companies, third sector entities, educational institutions, government agencies – submit their reports, adding information that transcends accounting and financial ones, such as their ESGs practices.

After the introduction above, this *conceptual paper* is divided as follows: question-problem, main objective of the research, relevance of the research, justification for the choice of universities as research locus, theoretical framework, the method used, the result of the literature review, and final considerations.

## 2 QUESTION-PROBLEM

The construction of the question-problem of this article took into account three elements:

1) the importance that ESGs have assumed in the contemporary world;

2) sustainability reporting in universities being still in its early stage when compared to sustainability reporting in companies; and

3) the fact that the focus on ESG practices, as well as their integrated analysis, provide communication to the market in a transparent manner.

Thus, the following question-problem was defined: to what extent did the international academic literature on university sustainability in 2021 focus and analyze ESG practices in an integrated way?

[3] Agenda 21 can be defined as a planning instrument for the construction of sustainable societies, on different geographical bases, which reconciles methods of Environmental Protection, social justice and economic efficiency.

[4] See explanation of this initiative in Section 8, item 4.

## 3 MAIN OBJECTIVE OF THE RESEARCH

The main objective of this work was to verify the most recent state-of-the – art of international academic research –that is, published in 2021-on sustainability in universities in published research regarding ESG, to identify any gaps that can be covered in a subsequent larger study.

## 4 RELEVANCE OF THE RESEARCH

This research is relevant because companies that intend to achieve sustainable development need to be concerned with several aspects: 1) economical, such as type and value of investment, smart products, and presence in the market; 2) Social, such as good negotiation practices, sustainable consumption and social responsibility related to the safety of collaborators, *stakeholders* and communities; 3) Environmental, which relate to the life cycle of the product, including *design*, transport, raw materials for production, and recycling. Interest in the concept of Sustainable Development has been increasing among scientists and professionals in companies, facing the challenge of producing more and more products with depleted resources, and causing less pollution and damage to meet growing consumption (BOŻENA GAJDZIK et al.,. 2020).

## 5 JUSTIFICATION FOR THE CHOICE OF UNIVERSITIES AS LOCUS OF RESEARCH

For the past 30 years, sustainable universities have been an important issue. When examining sustainability in higher education (SHE), particularly with regard to warning about environmental deterioration, more than 1,400 universities worldwide have signed an SHE declaration (SUWARTHA; SARI, 2013).

The concept of SHE was widely used to find out the existing situation of the University in terms of sustainability not only in western universities, but also in Asia. As recognized in Agenda 21 and in the international declarations and initiatives related to higher education, universities have the potential to contribute to the social, environmental and economic sustainabilities of higher education in order to guide the implementation of the declarations, sustainable development assessment models have been developed or modified especially for higher education, with the main objective of improving the sustainability of *campuses* (LIDGREN; RODHE; HUISINGH, 2006; LOZANO, 2006; LOZANO; YOUNG, 2013; YUAN; ZUO; HUISINGH, 2013; LEE; BARKER; MOUASHE, 2013; SUWARTHA; SARI, 2013; DRAHEIN; LIMA; COSTA, 2018).

Some of these evaluation models stand out, the explanations of which can be found in Section 6 of this *conceptual paper*:

1) the audit instrument for sustainability in Higher Education ;
2) the tracking, evaluation and Classification of sustainability;
3) the GreenMetric;
4) the Green Report Card;
5) the graphical assessment for sustainability in universities;
6) the Environmental Sustainability Assessment Questionnaire and the Self-Assessment; and
7) the sustainability guidelines of the Global Reporting Initiative.

The results of Lozano's (2011) research show that sustainability reporting in universities, both in number of reporting institutions and in reporting level, is still incipient when confronted with sustainability reporting applied in companies. This is corroborated by Gomez *et al*. (2015), WHO report that there are few studies on the application of sustainability assessment models in universities in developing countries, a shortage especially evident in South America.

Sterling (2001, *apud* LIDGREN; RODHE; HUISINGH, 2006) highlighted four main functions that a university could use to assess which of these aspects the studied university currently focuses on, in order to better understand the extent to which sustainability issues have been incorporated into its function: (I) to replicate society and culture and to promote citizenship and socialization function. (ii) to train people for future employment and the vocational function. (iii) to help people develop their potential and the liberal function. (iv) to encourage change towards a better world and a more just society and transformative function.

Six were the principles to be used towards a modern education: 1. All education is environmental education. 2. The goal of education is not the mastery of the subject, but of the self. 3. Knowledge carries with it the responsibility to care. 4. Until one understands the effects of this on real people and their communities, one cannot claim to know anything. 5. The power of example over words. A university must live as it preaches; it cannot, for example, invest its financial weight in irresponsible things. 6. The way learning occurs is as important as the content of certain courses (ORR, 2004, *apud* LIDGREN; RODHE; HUISINGH, 2006)

According to Drahein, Lima and Costa (2019), it is through the curriculum and the structures of the programs, the alternative to implement sustainability in HEI. While the

research conducted by Roorda (2001) did not directly address curriculum issues, sustainability in curricula has been discussed in the literature-see, for example, Peet *et al*.. (2004), Lidgren *et al*.. (2006) and Minguet *et al*.. (2011). This division is necessary to generate more specific issues with an organizational focus and it is expected that when service operations are focused on sustainable development, they will naturally attract actions linked to the curriculum. Adding Smith (1993) in this perspective, it has been, as a basic assumption, that HEIs play an important role in the dissemination of best practices for Sustainability Management, acting as reference models.

Dalal-Clayton and Bass (2002) and Cole (2003) offer a comprehensive list of guidelines for sustainability reporting, with their advantages and disadvantages. The most widely used guidelines include: the ISO 14000 series (especially ISO 14031) and the Eco-Management and audit scheme; the 8000 Social Responsibility standard (SAI, 2007); and the GRI Sustainability guidelines.

In the particular case of universities, Shriberg (2002) offers a comparison of the different guidelines developed. Some examples include the National Wildlife Federation's State of the Campus environment, the Sustainability Assessment Questionnaire, the higher education sustainability indicators 21, and the audit instrument for Sustainable Higher Education. Among the different guidelines, the GRI Sustainability Guidelines document provides one of the best options (HUSSEY *et al.*., 2001; LOZANO, 2006; MORHARDT *et al.*., 2002). Nevertheless, GRI guidelines have not been developed for universities (COLE, 2003). Therefore, they need modifications and complements to include the core competence of universities, the educational dimension, as proposed by Lozano (2006, 2011).

It can be seen that sustainability reporting is important for universities to recognize their role within and outside the academic community by identifying where improvements can be implemented. The power of example over words stands out: a university must live as it preaches, not being able, for example, to invest its financial weight in irresponsible initiatives. HEIs play an important role in disseminating best practices for Sustainability Management, acting as reference models. In universities, ESG reports are important to provide information to their decision makers, assisting management in accountability to society for their environmental, social and economic practices. Therefore, ESG practices shed light on the financial and non-financial practices of universities.

## 6 THEORETICAL FRAMEWORK

### 6.1-Corporate Sustainability

Corporate sustainability (CS) is presented as an investment or a business strategy that includes the adoption of best management practices that meet the current and future needs of *stakeholders*. Investments in CS have been increasingly debated among academics, administrators and other stakeholders in the company, causing questions that have not yet been conclusively answered. In this regard, it is worth highlighting the existence of a conflict of arguments between the benefits achieved with investments in corporate sustainability. On the one hand, there is an argument that business activity has an ethical dimension, which goes beyond the economic and legal dimensions. There is no consensus on the nature of this dimension and on who should be responsible for it (ANDRADE et al, 2013).

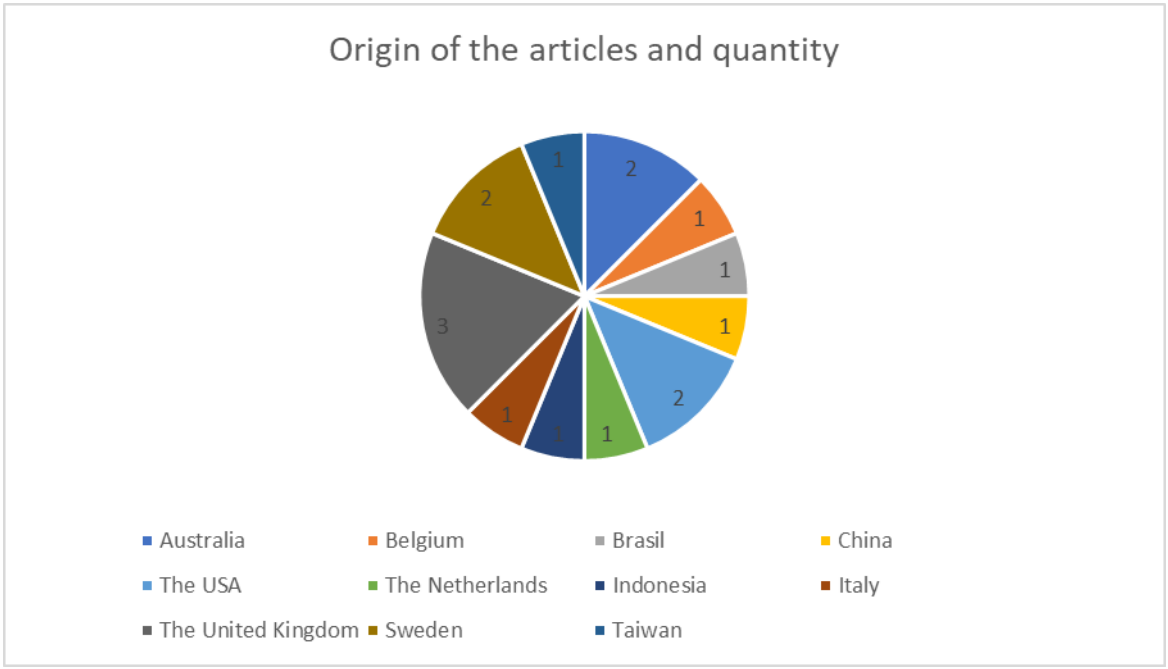
### 6.2 ESG classification (Environmental, Social and Governance)

The importance and benefits of corporate sustainability and accountability have also been introduced in other areas such as corporate governance. Recent research identifies key performance, financial and non-financial, through *Key Performance Indicators* (KPIs) for each of the areas of sustainable development and their integration into the organization's mission, objectives, operations, culture and strategies. Traditionally, business firms have focused on profits as their key KPIs. With regard to the environmental dimension, many of the environmental disasters that have occurred in the last decade demonstrate that companies ' environmental policies are vital for economic sustainability and business maintenance, as well as for the well-being of society. Global environmental initiatives such as the Kyoto Protocol, Copenhagen Accord, the Clean Air initiative, and the International Council for local environmental initiatives (ICLEI), have influenced humanity to look at environmental issues in addition to addressing the responsibilities of organizations to the environment. These initiatives have had a profound effect on how society and the business world have come to view environmental impacts. The social dimension is usually formed by the categories related to workforce, human rights, community and product responsibility (BROCKET; REZAEE, 2012; SOSCHINSKI et al, 2019; ALEXANDRINO, 2020)

### 6.3 Sustainability in universities

In order to highlight the state of the art on sustainability applied in universities, the table placed in Appendix B was elaborated, based on the 16 identified articles related to the research problem.

When the result of the literature review on sustainability in universities around the world is pointed out it is clear that research on sustainability at Universities is incipient and well distributed around the world, as can be seen in Graph 1 below:. Graph 1 shows the origin of the articles found. In 2006, Sweden and the United Kingdom stood out. In 2008 only one from the Netherlands. In 2011 one from the United Kingdom and one from Italy. The year with the most publications found was in 2013, highlighting the countries: Belgium, China, Australia, Indonesia and USA. In 2014 one from Australia and one from the United Kingdom. In 2015 one from Sweden and one from the United Kingdom, finally 2019 Brazil and 2021 Taiwan.




**Graph 1. Origin of the researched articles.**

## 7 METHOD

This inductive research triangulated two means, applied sequentially: bibliometric research and literature review (THIOLLENT, 2009; VANTI, 2002). This qualifies it as a qualitative approach, whose findings shed light on the people behind the numbers and point out faces in the statistics, to deepen understanding, facilitating the study of issues in depth and in detail (PATTON, 2002).

The choice of these means is justified by the purposes of the study: 1) Locate the relevant material; 2) study quantitative aspects of this production through mathematical-statistical tools; and 3) verify the theoretical stage of the subject focused, with the purpose of

raising its new approaches, visions, applications and updates (ARAÚJO, 2006; THIOLLENT, 2009).

On the other hand, the logic of triangulation is based on the premise that no single method adequately solves the problem of rival causal factors. As each method reveals different aspects of empirical reality, several methods of observation must be employed (PATTON, 2002).

As for the purposes, it is descriptive research, which has, as its main objective, to describe characteristics of a certain population or phenomenon, or to establish relationships between variables. One of its most significant characteristics is the use of standardized data collection techniques. Descriptive research is concerned with observing the facts, recording them, analyzing them, classifying and interpreting them, and the researcher does not interfere with them. Thus, the phenomena of the physical and human worlds are studied, but are not manipulated by the researcher (GIL, 2002; MARTINS, 2002).

### 7.1 BIBLIOMETRIC RESEARCH

The planning of this research involved the use of bibliometric scientific mapping from the use of the free *software* RStudio, which is part of the Bibliometrix package and CAPES indexes for the location of the most relevant studies on the subject to be researched, according to the bibliometric criteria used in Qualis-reference (Scopus CiteScore, Web of Science JCR and Google Scholar H indexes), according to capes Circular Letter No. 31/2020 (coordination for the improvement of Higher Education personnel, 2020). The use of RStudio as a tool for comprehensive scientific mapping analysis was initially proposed by Aria and Cuccurullo (2017).

The bibliometric Research – whose deeper detail can be found in Appendix A – was carried out in mid-2021, and followed the following steps:

1) Articles published in the last 3 years on corporate sustainability, ESG and IR on the web of Science, Scopus and Google Scholar platforms were searched, with the selection criteria being the search for the keywords “Corporate Sustainability”, “ESG”, “integrated reporting” and “principles for Responsible Investments” in the title of the article, in the abstract and in the descriptors of the articles.
2) In view of the large number of articles resulting, only the year 2021 was delimited, which meant a final sample of 50 articles.
3) Out of 50 articles, only 16 were related to sustainability in universities and none of them addressed IR.

By way of illustration, Figure 2 in Appendix A shows the most relevant keywords that emerged from the search.

As a result of the bibliometric research, articles published in the last three years available in the web of Science and Scopus knowledge bases were searched, 28 articles were identified when using as keywords in the selection criteria “Corporate Sustainability”, “ESG”, “integrated reporting” and “principles for Responsible Investments”. Appendix A of this research shows these 28 articles with the respective name(s) of the author(s), title, Journal of publication, keywords and DOI.

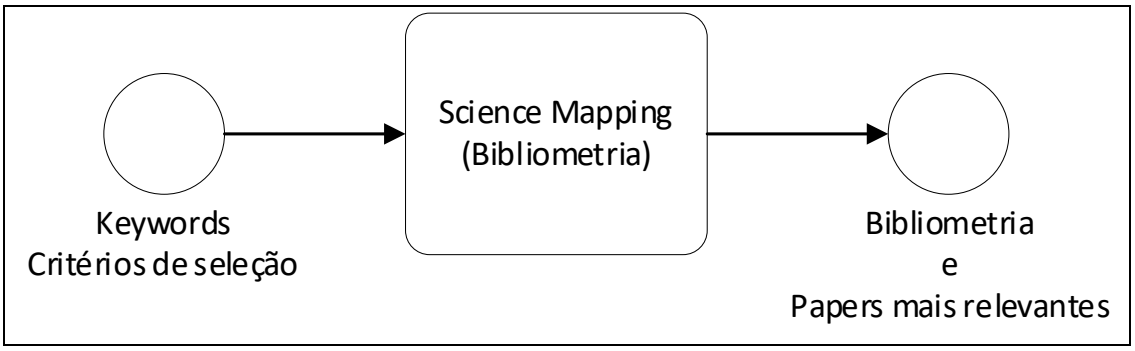



**Figure 1-proposed model for scientific mapping**

Source: own elaboration

The five stages proposed by Zupic and Cater (2015) were adopted as the standard workflow: 1) Study Design; 2) Data Collection; 3) data analysis; 4) Data Visualization; and 5) interpretation. In the first stage, the selection criteria, the search time window, the types of documents to be searched, and the knowledge bases to be used for the generation of data collection were defined.

The complete searches in both databases will be exported in bibtex format and combined into a single data collection, whose structure will be compatible with the *data frame* from the Bibliometrix library, according to Table 1 in Appendix A.

A Multiple Criteria Decision Analysis (MCDA) method will be applied to the data set for the classification of articles. The method to be adopted is the one proposed by Pagani, Kovaleski and Resende (2015) which establishes the following equation for ranking and classification:

$$InOrdinatio = \alpha * IF + \beta * [10 - (\text{Research year} - \text{Issue year}) + \gamma Ci$$

Where:

α = weight to be given to the Impact Factor. Originally 1.

IF = impact factor in the JCR of the journal where the paper was published.

β = weight you want to give to the most recent publication. Usually 1, ranging from 1 to 10 (authors ' suggestion).

γ = weight to be given to the number of citations in the paper. Originally 1.

Ci = number of citations in the paper.

The main article selected will be the one whose InOrdinatio is higher, the second and third placed will be the complementary and/or auxiliary articles for the execution of the work. In the data collection phase, the research was carried out using the pre-established criteria in the study design in the selected knowledge bases. When creating the data collection, there was the exclusion of occurrences that were in both knowledge bases, thus totaling 28 different occurrences.

In the data analysis phase, the biblioAnalysis function was performed within RStudio in our data collection and the following information was obtained: in the time window between 2018 and 2021, 20 sources were searched with 28 documents that used 2,295 references, as evidenced in Figure 3 in Appendix A.

In the data analysis, visualization and interpretation phase, statistics and relationships revealed by the data collection were verified. It is possible to extract from the data collection information about the annual scientific production on the subject and observe if there was an increase in interest in the topic in the chosen time window. An annual growth rate of 51.83% was observed on the subject studied, as shown in Figure 4 in Appendix A.

It is also possible to quantitatively list the most productive authors on the subject researched, as shown in Figure 5 in Appendix A. The statistics also bring the correspondence of the authors to their countries, where one can observe the predominance of Italy, the USA, Brazil and China in the first four positions. It is possible to notice a difference of 1 Article between the four first placed, as shown in Figure 6 in Appendix A. The statistics of the data set also provide us with information about which are the most relevant sources under the search criterion used. The Journal of Cleaner Production and Business

Strategy and the Environment are highlighted as the source of 8 of the 28 articles surveyed (5) according to Figure 7 in Appendix A.

With the research it was possible to identify the total citations by countries. Brazil appeared in first place with an average of 11 citations of the articles researched. Followed by the USA with an average of 6.75 citations of the articles surveyed, as shown in Figure 7 in Appendix A.

The InOrdinatio was applied for ranking and all articles were classified in descending order by the score Scorpus column. Just to highlight the methodology bringing the result of the application of the MCDA iNOrdiatio to bring a first ranking according to figure 8 in Appendix A. The green structure of Figure 9 follows the *bibliometrix dataframe* while the structures in red bring the the *score* indexes from Scopus CiteScore, Web of Science JCR and Google Scholar h-indexes, in addition to InOrdinatio.

After the use of these articles in the bibliometric research to evidence and substantiate the theoretical framework, the delimitation of the research was defined, that is, the sustainability applied in universities. Finding 4,607 results on Web of Science and 5,636 results on Scopus. We chose to filter only articles and year 2021, reaching 258 articles in the Web of Science and 360 in Scopus. We searched for a new filter and there were still many articles, defining open access as the last criterion, leaving 50 in the Web of Science and 88 in Scopus. It was decided to study and research only the 50 articles in the area carried out research in Web Science. When analyzing these 50 articles, it was necessary to use 16 articles that were related to the desired subject.

**7.2 LITERATURE REVIEW**

For the detailed analysis of the content of the 16 articles that referred to sustainability in universities, the order of classification of the articles in Mendeley was used, followed by the full reading of the material.

With Mendeley's star-shaped tagging tool, articles read and that had something to contribute to the research were highlighted. With the tagging, it was possible to draw the attention of the articles whose reading had been carried out that had some aggregating comment to the work. In each article read that brought something interesting to the research, the citable text was marked in yellow and a text box was inserted to insert comments.

After reading the articles, Word and Mendeley were simultaneously used to write this *paper*. As a quote was made using the tool *insert citation* in Word, when the text was finished, the resource was used *insert bibliography* to mitigate the risk of forgetting the inclusion of citations in the list of references.

## 8 RESULT OF LITERATURE REVIEW

The representativeness of sustainable investments from different regions of the world is not homogeneous, given the different stages of maturity in relation to the perception of the importance of ESG factors and the consequent incorporation of sustainable strategies. . The European continent, when compared to the USA and Japan, has been leading this race, due to sustainable investments. .This is because, in these two countries, the representativeness of sustainable investments is lower than when compared to Europe, respectively around 26% and 18% (ARORA; DHARWADKAR, 2011; MUNIR, et al.., 2019; UNGARETTI et al.., 2020; ANTONCIC, 2020).

From the point of view of companies, there is still much to be done so that long-term results in terms of sustainability are achieved. However, on the positive side, it is observed that the increasing focus on environmental, social and governance issues by investors, as well as by society in general, has already had effects on the behavior of companies, either because they are in fact aligned with ESG principles or simply because they recognize that to attract capital this is an increasingly essential factor. Companies can take specific steps to tangibly integrate sustainability risk factors into their financing, into their operational processes and into their internal decision-making. Companies are striving harder for a sustainable performance, incorporating the economical, social and environmental policies in their commercial operations . The corporate governance plays an important role in this regard, on an effective decision-making related to their proactive sustainability practices (ARORA; DHARWADKAR, 2011; MUNIR *et al.*., 2019; UNGARETTI, 2020; ANTONCIC, 2020).

## 9 FINAL CONSIDERATIONS

Research has shown that universities have a discouraging history of long-term environmental efforts. However, it was possible to understand that, as HEIs are complex systems, it is essential that they seek the integration of sustainability in all their activities, responsibilities and mission.

HEIs have been recognized as critical to the shift towards sustainable development. Regarding sustainability in universities, several studies around the world have been carried out, and researchers report that this is a relatively new subject and that more research is needed to bring robustness to the subject. It was also noticed that, in developing countries, especially those of South America, this issue needs to be deepened.

Thus, the answer that this research brought to the problem question is that the academic literature on sustainability reporting and ESG practices needs more scientific commitment. Therefore, it has become clear that the matter lacks debate and further investigation.

With this, it is considered that the objective of this research has been achieved, to verify the state-of-the-art of international academic research on sustainability in universities with regard to ESG, to identify any Gap(s) that can be covered in a subsequent larger study.

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**APENDIX A**

**FigurE 2 – Most Relevante keynords**

Source: RStudio (2021)

Most Relevant Keywords

| | Author Keywords (DE) | Articles | Keywords-Plus (ID) | Articles |
|---|---|---|---|---|
| 1 | SUSTAINABILITY | 11 | IMPACT | 8 |
| 2 | ENVIRONMENT | 3 | SUSTAINABLE DEVELOPMENT | 7 |
| 3 | ENVIRONMENTAL | 3 | FINANCIAL PERFORMANCE | 5 |
| 4 | SUSTAINABLE DEVELOPMENT | 3 | BIBLIOMETRICS | 4 |
| 5 | 0 | 2 | DISCLOSURE | 4 |
| 6 | BIBLIOMETRIC ANALYSIS | 2 | GOVERNANCE | 4 |
| 7 | BIBLIOMETRICS | 2 | RESPONSIBILITY | 4 |
| 8 | BUSINESS SUSTAINABILITY PERFORMANCE | 2 | SUSTAINABILITY | 4 |
| 9 | CLIMATE CHANGE | 2 | ARTICLE | 3 |
| 10 | CORPORATE SOCIAL RESPONSIBILITY | 2 | CLIMATE CHANGE | 3 |

**Framework 1 – Bibliometrix dataframe**

Source: Aria e Cuccurullo (2017).

| Field Tag | Class | Description |
|---|---|---|
| *UT* | CHARACTER | Unique Article Identifier |
| *AU* | CHARACTER | Authors |
| *TI* | CHARACTER | Document Title |
| *SO* | CHARACTER | Publication Name (or Source) |
| *JI* | CHARACTER | ISO Source Abbreviation |
| *DT* | CHARACTER | Document Type |
| *DE* | CHARACTER | Authors' Keywords |
| *ID* | CHARACTER | Keywords associated by WoS or Scopus database |
| *AB* | LARGE CHARACTER | Abstract |
| *C1* | CHARACTER | Author Address |
| *RP* | CHARACTER | Reprint Address |
| *CR* | LARGE CHARACTER | Cited References |
| *TC* | NUMERIC | Times Cited |
| *PY* | NUMERIC | Year |
| *SC* | CHARACTER | Subject Category |
| *DB* | CHARACTER | Bibliographic Database |

**Figure 3 – Main information about data**

Source: RStudio (2021)

MAIN INFORMATION ABOUT DATA

| | |
|---|---|
| Timespan | 2018 : 2021 |
| Sources (Journals, Books, etc) | 20 |
| Documents | 28 |
| Average years from publication | 0.923 |
| Average citations per documents | 4.036 |
| Average citations per year per doc | 1.558 |
| References | 2295 |

DOCUMENT TYPES

| | |
|---|---|
| article | 20 |
| article; early access | 2 |
| review | 6 |

DOCUMENT CONTENTS

| | |
|---|---|
| Keywords Plus (ID) | 240 |
| Author's Keywords (DE) | 116 |

AUTHORS

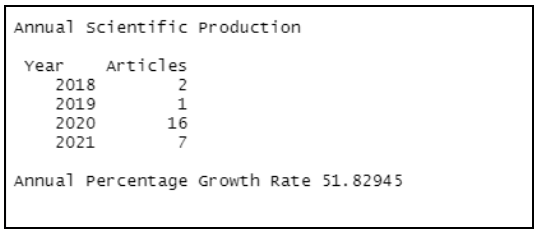
| | |
|---|---|
| Authors | 95 |
| Author Appearances | 95 |
| Authors of single-authored documents | 1 |
| Authors of multi-authored documents | 94 |

AUTHORS COLLABORATION

| | |
|---|---|
| Single-authored documents | 1 |
| Documents per Author | 0.295 |
| Authors per Document | 3.39 |
| Co-Authors per Documents | 3.39 |
| Collaboration Index | 3.48 |

**Figure 4 – Annual Scientific Production**

Source: RStudio (2021)



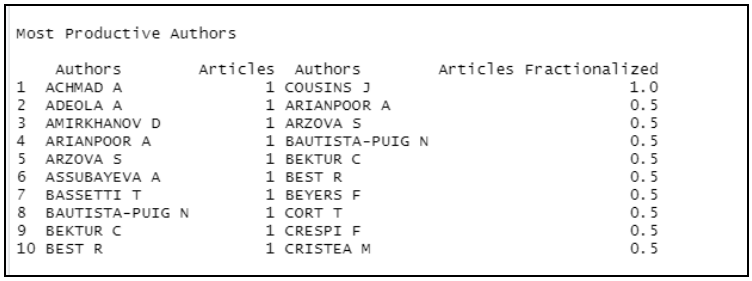
```
Annual Scientific Production

 Year    Articles
    2018        2
    2019        1
    2020       16
    2021        7

Annual Percentage Growth Rate 51.82945
```

**Figure 5 – Most Productive Authors**

Source: RStudio (2021)

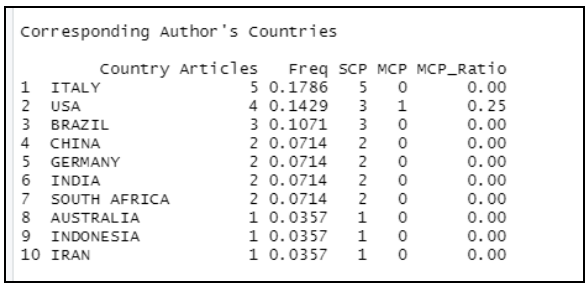


```
Most Productive Authors

    Authors        Articles  Authors        Articles Fractionalized
1  ACHMAD A               1 COUSINS J                          1.0
2  ADEOLA A               1 ARIANPOOR A                        0.5
3  AMIRKHANOV D           1 ARZOVA S                           0.5
4  ARIANPOOR A            1 BAUTISTA-PUIG N                    0.5
5  ARZOVA S               1 BEKTUR C                           0.5
6  ASSUBAYEVA A           1 BEST R                             0.5
7  BASSETTI T             1 BEYERS F                           0.5
8  BAUTISTA-PUIG N        1 CORT T                             0.5
9  BEKTUR C               1 CRESPI F                           0.5
10 BEST R                 1 CRISTEA M                          0.5
```

**Figura 6 – Countries with the highest numbers of articles**

Source: RStudio (2021)



```
Corresponding Author's Countries

        Country Articles   Freq SCP MCP MCP_Ratio
1  ITALY               5 0.1786   5   0      0.00
2  USA                 4 0.1429   3   1      0.25
3  BRAZIL              3 0.1071   3   0      0.00
4  CHINA               2 0.0714   2   0      0.00
5  GERMANY             2 0.0714   2   0      0.00
6  INDIA               2 0.0714   2   0      0.00
7  SOUTH AFRICA        2 0.0714   2   0      0.00
8  AUSTRALIA           1 0.0357   1   0      0.00
9  INDONESIA           1 0.0357   1   0      0.00
10 IRAN                1 0.0357   1   0      0.00
```

**Figure 7 – Most relevant sources**

Source: RStudio (2021)

Most Relevant Sources

| | Sources | Articles |
|---|---|---|
| 1 | JOURNAL OF CLEANER PRODUCTION | 4 |
| 2 | BUSINESS STRATEGY AND THE ENVIRONMENT | 3 |
| 3 | ENVIRONMENTAL RESEARCH LETTERS | 2 |
| 4 | SUSTAINABILITY | 2 |
| 5 | SUSTAINABILITY (SWITZERLAND) | 2 |
| 6 | AMFITEATRU ECONOMIC | 1 |
| 7 | CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL MANAGEMENT | 1 |
| 8 | ECOLOGICAL ECONOMICS | 1 |
| 9 | ENERGIES | 1 |
| 10 | ENERGY POLICY | 1 |

**Figure 8 – Total citations per country**

Source: RStudio (2021)

Total Citations per Country

| | Country | Total Citations | Average Article Citations |
|---|---|---|---|
| 1 | BRAZIL | 33 | 11.00 |
| 2 | USA | 27 | 6.75 |
| 3 | GERMANY | 18 | 9.00 |
| 4 | ITALY | 6 | 1.20 |
| 5 | NETHERLANDS | 6 | 6.00 |
| 6 | INDONESIA | 5 | 5.00 |
| 7 | POLAND | 4 | 4.00 |
| 8 | AUSTRALIA | 3 | 3.00 |
| 9 | SOUTH AFRICA | 3 | 1.50 |
| 10 | UNITED KINGDOM | 3 | 3.00 |

**Figure 9 – Results from the MCDA InOrdinatio application**

Source: Own elaboration

| 1 | Dados obtidos das bases via Bibliometrix | | | | | | | | | | | Índices | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | AU | TI | SO | AB | DE | ID | DI | LA | DT | TC | PY | FI_JCR | Cite_Score_Scopus | Google H index | Ordinatio | orinatio modificado (com JCR e CiteScore) | Qualis |
| 3 | PALUMBO R;MANESH M;PELLEGRINI M;CAPUTO A;FLAM | ORGAI | JOURN | CITIES | SMAR | ECON | 10.10 | ENGLI | ARTICI | 0 | 2021 | 7,246 | 10,9 | 616 | 18,25 | 20,07 | A1 |
| 4 | BAUTISTA-PUIG N;SANZ-CASADO E | SUSTA | JOURN | HIGHE | BIBLIC | INDUS | 10.10 | ENGLI | ARTICI | 0 | 2021 | 7,246 | 10,9 | 616 | 18,25 | 20,07 | A1 |
| 5 | LUO J;HAN H;JIA F;DONG H | AGRIC | JOURN | SINCE | AGRIC | AGRIC | 10.10 | ENGLI | REVIE | 3 | 2020 | 7,246 | 10,9 | 616 | 20,25 | 22,07 | A1 |
| 6 | BEYERS F;HEINRICHS H | GLOB/ | JOURN | SINCE | NA | MERG | 10.10 | ENGLI | REVIE | 0 | 2020 | 7,246 | 10,9 | 616 | 17,25 | 19,07 | A1 |
| 7 | FERRER A;THOM A;SCAVARDA A | SUSTA | RESOL | URBAI | CITY G | CLIMA | 10.10 | ENGLI | ARTICI | 30 | 2018 | - | 10,7 | - | 38,00 | 43,35 | A1 |
| 8 | XENARIOS S;ASSUBAYEVA A;XIE L;SEHRING J;AMIRKHAN | A BIBL | ENVIR | ENGIN | CENTR | ECON | 10.10 | ENGLI | REVIE | 0 | 2020 | 6,096 | 8,9 | 84 | 16,10 | 17,50 | A1 |
| 9 | NEWELL J;GOLDSTEIN B;FOSTER A | A 40YE | ENVIR | ESSEN | ENERG | ENVIR | 10.10 | ENGLI | REVIE | 27 | 2019 | 6,096 | 8,9 | 84 | 42,10 | 43,50 | A1 |
| 10 | BEST R;ZHANG Q | WHAT | ENERG | ECON | CARBC | SOCIA | 10.10 | ENGLI | ARTICI | 3 | 2020 | 10,084 | 8,7 | 174 | 23,08 | 22,39 | A1 |
| 11 | BASSETTI T;BLASI S;SEDITA S | THE M | BUSIN | THE LI | ENVIR | CORP | 10.10 | ENGLI | ARTICI | 1 | 2021 | 5,483 | 8,4 | 232 | 17,48 | 18,94 | A1 |
| 12 | MAROUN W;PRINSLOO A | DRIVE | BUSIN | EXTER | COMB | SOCIA | 10.10 | ENGLI | ARTICI | 3 | 2020 | 5,483 | 8,4 | 232 | 18,48 | 19,94 | A1 |
| 13 | GARCIA A;ORSATO R | TESTIN | BUSIN | CONSI | CORP | CORP | 10.10 | ENGLI | ARTICI | 3 | 2020 | 5,483 | 8,4 | 232 | 18,48 | 19,94 | A1 |
| 14 | COUSINS J | JUSTIC | ECOLC | NATUF | ADAPT | ACADE | 10.10 | ENGLI | ARTICI | 0 | 2021 | 8,964 | 6,9 | 280 | 19,96 | 18,93 | - |
| 15 | NIU Z;ZHOU X;PEI H | SOCIA | CORP | USING | CORP | POLITI | 10.10 | ENGLI | ARTICI | 2 | 2020 | 4,542 | 5,9 | 135 | 16,54 | 17,22 | - |
| 16 | DROSTE N;DAMATO D;GODDARD J | WHER | PLOS | WE AN | NA | FRESH | 10.13 | ENGLI | ARTICI | 18 | 2018 | 2,740 | 5,2 | 525 | 28,74 | 29,97 | A1 |
| 17 | LA T M;MANGO F;CAFARO A;LEO S | DOES | SUSTA | RECEN | ESG; E | CORP | 10.33 | ENGLI | ARTICI | 3 | 2020 | 5,152 | 4,6 | 312 | 18,15 | 17,88 | |
| 18 | CRESPI F;MIGLIAVACCA M | THE DI | SUSTA | CORP | ESG CI | CORP | 10.33 | ENGLI | ARTICI | 2 | 2020 | 5,152 | 4,6 | 312 | 17,15 | 16,88 | |
| 19 | GAJDZIK B;GRABOWSKA S;SANIUK T | SUSTA | ENERG | THE M | INDUS | SUPPL | 10.33 | ENGLI | ARTICI | 4 | 2020 | 2,702 | 3,8 | 138 | 16,70 | 17,25 | |
| 20 | GOERLANDT F;LI J;RENIERS G | THE LA | INTERI | RISK C | BIBLIC | CLUST | 10.33 | ENGLI | ARTICI | 6 | 2020 | 5,698 | 3,0 | 340 | 21,70 | 20,35 | |
| 21 | DOS S J;MOURA-LEITE R;GOMES ;PEREIRA M;PAGAN M | SOCIA | SOCIA | PURP | TRANS | CORP | 10.11 | ENGLI | ARTICI | 0 | NA | - | 2,5 | - | -1.000,00 | -1.000,00 | |
| 22 | ARIANPOOR A;SALEHI M | A FRAI | MANA | PURP | BUSIN | TRIPLE | 10.11 | ENGLI | ARTICI | 0 | 2021 | - | 2,4 | - | 11,00 | 12,20 | |
| 23 | NITESCU D;CRISTEA M | ENVIR | AMFIT | THE PI | SUSTA | FINAN | 10.24 | ENGLI | ARTICI | 2 | 2020 | 1,625 | 1,8 | - | 13,63 | 13,71 | |
| 24 | SHARMA P;PANDAY P;DANGWAL R | DETER | INTERI | THE PU | ENVIR | FINAN | 10.10 | ENGLI | ARTICI | 1 | 2020 | - | 1,6 | - | 11,00 | 11,80 | |
| 25 | FAISAL F;SITUMORANG L;ACHMAD A | THE RO | JOURN | THIS S | CSR; D | INDON | 10.13 | ENGLI | ARTICI | 5 | 2020 | - | - | - | 15,00 | 15,00 | |
| 26 | CORT T;ESTY D | ESG ST | ORGAI | WE AR | SUSTA | CORP | 10.11 | ENGLI | ARTICI | 0 | 2020 | - | - | - | 10,00 | 10,00 | |
| 27 | BEKTUR C;ARZOVA S | THE EF | JOURN | SUSTA | ENVIR | CORP | 10.10 | ENGLI | ARTICI | 0 | NA | - | - | - | -1.000,00 | -1.000,00 | |
| 28 | BOTAI J;BOTAI C;NCONGWANE K;MPANDELI S;NHAMO L | A REVI | SUSTA | NOTW | ENERG | BIBLIC | 10.33 | ENGLI | REVIE | 0 | 2021 | - | - | - | 11,00 | 11,00 | |
| 29 | SECINARO S;CALANDRA D;PETRICEAN D;CHMET F | SOCIA | SUSTA | SOCIA | BIBLIC | BANKI | 10.33 | ENGLI | ARTICI | 0 | 2021 | - | - | - | 11,00 | 11,00 | |
| 30 | PINHEIRO A;GOVIND M | EMERG | JOURN | URBAI | KEYW | NA | 10.55 | ENGLI | REVIE | 0 | 2020 | - | - | - | 10,00 | 10,00 | |

## APENDIX B – SUMMARY TABLE WITH THE 16 UNIVERSITIES SURVEYED

| Autor (es) | Objetivo | Ano/País | Conclusão |
|---|---|---|---|
| Lidgren; Rodhe; Huisingh | The purpose of the study was to identify barriers to including sustainability-related content throughout Lund University curricula, and eventually to develop solutions to eliminate/overcome these barriers. | 2006 Lund, Sweden | The main conclusions of this article are that Meadow's approach can be a useful tool to<br><br>a) systematically identify and characterise the barriers towards achieving the organisational objective of incorporating SD into courses and curricula; |

| | | | |
|---|---|---|---|
| | | | b. identify ways to overcome these barriers;<br><br>c. increase chances that these barriers are addressed with sufficient leverage. |
| Lozano | This paper presents: (1) a comparison between different tools that have been developed to assess and report upon academic institutions' sustainability efforts; (2) a modification of one of these tools, the Global Reporting initiative (GRI) Sustainability Guidelines, for use in universities;<br><br>and (3) a tool developed by the author, the Graphical Assessment of Sustainability in Universities (GASU), that offers a condensed graphical<br><br>overview of the myriad of indicators from the GRI modification. | 2006 Wales CF10 3AT,<br><br>UK | The GASU was designed to facilitate the analysis, longitudinal comparison and<br><br>benchmarking of universities' sustainability efforts and achievement. |
| Roorda; Martens | This article describes the characteristics and results of an instrument used for the assessment of the integration of sustainable development in institutions of higher education. Reasons for the application of such an instrument are given, followed by an overview of the requirements that can be set for such an instrument in order to be effective. | 2008<br><br>Netherlands . | Lastly, the most recent developments in higher education are described, and the consequences for the assessment process are discussed. A new project is introduced for the development of an updated version of the instrument called AISHE 2.0. |
| Lozano | The purpose of this paper is to review and assess the state of sustainability reporting in universities. | 2011 Leeds, UK | The results show that sustainability reporting in universities is still in its early stages (both<br><br>in numbers of institutions reporting and in level of reporting) when compared to sustainability reporting<br><br>in corporations. |
| Manetti | The aim of the article is to investigate the quality of stakeholder engagement (SE) in sustainability reporting (SR). | 2011 *Firenze, Italy* | The fi rst part analyses the role of SE in SR according to the literature: SE is a fundamental step of the reporting process because of its role in defining materiality and relevance of the information communicated. The second part of the paper is dedicated to an empirical analysis of a sample of sustainability reports. The analysis showed that what is really applied in a wide majority of the cases is a stakeholder management approach rather than an SE approach. |
| Lambrechts; Mulà;Ceule | This article focuses on how these two, seemingly opposing, educational | 2013 Leuven, | Results of the analysis show that competences for SD related to responsibility and emotional |

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| mans; Molderez; Gaeremynck | innovations can be combined to strengthen the integration of SD in higher education. | Belgium | intelligence are widely integrated, while competences for SD dealing with system orientation, future orientation, personal commitment, and action taking are virtually absent. The analysis also shows that many competences for SD could be discovered within the selected study programs, though in an implicit and fragmented way, thus not covering all necessary fields of knowledge, skills, and attitudes. This calls for an adjustment of the study programs to clearly and explicitly integrate competences for SD, especially those related to system orientation, future orientation, personal involvement, and action taking. |
| Yuan; Zuo; Huisingh | This paper was developed, based upon research designed to investigate the awareness of faculty, alumni and student's parents on sustainable development and their perceptions on the 'Green University'. A large-scale questionnaire survey was conducted with representatives of each of these three groups of stakeholders in the Shandong University, one of the largest academic institutions in China. | 2013 China | This research compared the perceptions of these three stakeholder groups with those of the student's perspectives, which were also researched several months earlier at Shandong University. Implications on the 'Green University' development are presented. The research findings provide a useful reference to improve both the sustainability performance in higher education at Shandong University as well as for 'Green Universities' more broadly throughout China and other parts of the world. |
| Lee; Barke; Mouashe | The aim of the present study was to investigate the degree to which universities in Australia have committed to declarations on sustainability by incorporating goals for sustainable development in their vision, mission and graduate attribute statements. Content | 2013 Austrália | The research identified that while many Australian universities publicly endorsed goals and values related to sustainability, the commitment was not reflected in the vision, mission and graduate attributes of business faculties/schools within the same institution. It is argued that if a commitment to higher education for sustainable development is not (at least) endorsed as a publicly espoused value at multiple levels of a university |
| Suwartha e Sari | Universitas Indonesia, in 2010 has developed an online world universities ranking, aimed to offer the portrait of the current conditions and policies related to green campus and sustainability in the universities all around the world. The aims of this paper are to introduce the evelopment and improvement of UI GreenMetric and evaluate the implementation and result of the year 2011. | 2013 Indonésia | The 2011 ranking results show an increment of the number of participating countries. There are more than 25 universities from the United States participated in this ranking. The main prevailing criterion achieved by many universities is the energy and climate change (about 2500 of 2800 maximum score). Most of the indicators in UI Green-Metric are in compliance with the Berlin Principles. The UI GreenMetric ranking provides opportunities for each university to examine their strength and weakness in promoting green university and |

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| | | | sustainable development. |
| Watson; Lozano; Noyes; Rodgers | This paper presents the results from the assessment of the sustainability content of the Civil and Environmental Engineering curriculum at the Georgia Institute of Technology using two complementary approaches: the Sustainability Tool for Assessing UNiversity's Curricula Holistically system and two students' perceptions surveys. | 2013<br><br>EUA | The results from the curriculum assessment indicated that the courses addressed mainly environmental issues, and that the depth of<br><br>coverage could be improved. The results from the students' surveys concurred with the curriculum<br><br>assessment, although there were some differences in regard to social issues. Using both approaches<br><br>provides a more holistic overview of the contribution of engineering courses and degrees to sustainability, and it allows detecting discrepancies between sustainability content in the syllabus and sustainability teaching in the classroom. |
| Hancock; Nuttman | This article focuses on a case<br><br>study of an Australian university program aimed at leveraging staff/student behavioural change and<br><br>wider institutional change by starting with sustainable transport (ST) in a context where the case study<br><br>university was coming from a low base on sustainability outside teaching activities. The case study<br><br>research program aimed to (1) engage with internal and external stakeholders identified with barriers and facilitators to ST, (2) encourage more ST behaviours via explicit Travel Plan strategies and (3) utilize the project to embed ST policy and programs institutionally and act as a catalyst for more extensive and integrated sustainability performance across a multi-camps university. In terms of strategic choice of the<br><br>case study, | 2014<br>Austrália | Universities have been slow to address the issue of their own operational carbon footprint and to publish sustainability reports of their own performance as a means of enhancing corporate image (as is now common for commercial corporations) and this could reflect the performance gap as many struggle in regard to their own organisational sustainability. Higher Education Institutions can play a significant role in building a sustainable paradigm. The case study presented here is part of an institutional journey to sustainability; 'an ongoing, collaborative learning process'. As observe: '(b)ehaviour change is a crucial objective of environmental education programs and the hardest to achieve'. |
| Miller; McAdam; McAdam | the aim of this paper is to examine the changing university business model within a region of the United Kingdom, using a stakeholder perspective that will aid theoretical development and refinement in both the business model and stakeholder fields. | 2014<br><br>UK | This examination is aided by consideration of the university business model as an activity system. Repeat interviews, combined with stakeholder theory, have been used to show how the changing university business model–stakeholder relationship has progressed through different stakeholder stages with resultant changes in content, structure and governance. Furthermore, conflicting objectives between each of the stakeholder groups (i.e. academics, industry liaison staff, technology transfer office staff and government support agency |

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| | | | representatives) have led to the university business model evolving not as a process of co-creation but rather in a series of transitions whereby multiple stakeholders are continually shaping the university business model through strategies that are dependent upon their salience. |
| Sammalisto; Sundstro; Holm | This university case study with data collected by open-ended survey questions explores how faculty and staff express their role in sustainability work within a Swedish university.<br><br>The authors developed a model to illustrate development of sustainability competence and its institutionalization.. | 2015 Sweden | Results show a large variation in perceptions of sustainability from waste separation to a complex understanding and integration of issues into education. Integration of sustainable development<br><br>as a university core competence is difficult for a whole university to reach. Interpretational flexibility<br><br>provides opportunities for discussing the sustainability concept in diverse academic traditions in different disciplines. Top management inspiration on different university levels is essential for integration. Continuous training and routines contribute to movement towards institutionalization of sustainability activities and to following up the process in universities. |
| Daneri; Trencher; Petersen | Findings show that contributions to stakeholder learning and partnership progress can occur through student participation models such as project-based learning, transacademic research, and internships. | 2015 EUA | Experiences from Oberlin College to leverage the Oberlin Project for educational purposes have shed light on potential models for student participation in a communi- ty-wide shift towards sustainability and carbon neutrality. Those found to be significant are project-based learning, transacademic research and internships. In particular, the production of honours theses generates valuable oppor- tunities for transacademic research and the transfer of student knowledge to project activities and stakeholders. This finding builds on previous work exploring potential student learning models in multi-stakeholder sustainabil- ity partnerships |
| Drahein, Lima e Costa | The objective of this paper is to test a procedure for assessing the adoption of sustainable practices in higher education technological institutions services, known as institutes of technology and polytechnic<br><br>universities. The model, named Sustainability Assessment for Higher Technological Education (SAHTE) | 2019 Brasil | The case studies, besides direct observations and document analysis, collected data from 170 interviews to faculty, staff, and students, and they show the lack of governmental incentives<br><br>toward sustainability in Higher Education Institutions (HEI). Although, there is no external incentives that contribute for the adoption of best practices as green offices, the studied institutions show isolated initiatives that mostly are related to solid waste management. There is a consensus among the<br><br>studied HEI directives that their educational programs does not address properly sustainability issues, which create a barrier for the academic |

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| | | | community to perceive the importance to develop a sustainability model for managing HEI institutions. Sustainability in these organizations could be approached in the perspective of service operations and connect their contribution to value creation. In turn, that hinders the implementation of selective waste collection, for instance, a basic service operation that is still incipient in at least six of the seven institutions analyzed. |
| Usak; Yuan; Kuan Chan | The aim of this research is to present the results of a study with the goal of helping educational institutions achieve their sustainability. As<br><br>a succession of quantitative and qualitative analyses and measurements, there are four valuable<br><br>and contributive findings in this research. | 2021 Taiwan | First, total tuition and miscellaneous revenues (TTMR), total university–industry cooperative revenues (TUCIR) and total grants from government (TGG) of higher-education governance (HEG) were able to directly and effectively increase higher-education sustainable value. This definitively indicates that current higher-education students and staff, as well as higher-education experts and professionals, indeed agree that the tuition and miscellaneous fees, university–industry cooperative, and government grant revenues have become the most critical determinants of university environment social governance (UESG). This is because the majority of higher-education institutions do need these revenue resources to advance a succession of environmental protections, social responsibilities, and governance performance for current higher-education institution sustainability development. Second, comprehensive scale of QS rankings (CS-QS) was the most important key determinant to evaluate the university social responsibility development (USRD), which means the majority of higher-education institutions have to pay more attention on the comprehensive scale of QS rankings (CS-QS) in order to make more sustainability count. The third finding is the number of student's publications (NSP), which was the most crucial key determinant to assay return on investments (ROI), meaning current higher-education students, staff, experts, and professionals consent to higher-education institutions having to establish an evaluated system for student's publications to stimulate students to publish their diversified studying outcomes in order to make students recognize their growth after taking courses in higher education. |

*Source:* Own elaboration