

Sustainability Indicators for Universities: Revision for a Colombian Case

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Abstract

The purpose of this paper is to orient universities on their first versions of the sustainability reports based on the Global Reporting Initiative (GRI) guidelines, which, as mentioned by Hussey et al. (2001), Lozano (2006) and Morhardt et al. (2002) is the best option for sustainability reporting in universities. The paper analyses the sustainability indicators reported by 26 universities following the GRI guidelines, 18 revised by the authors and others reviewed by Lozano (2011), in order to establish a pathway for new universities wanting to elaborate their sustainability reports and also offers a perspective of new indicators that can be covered in forthcoming reports.

Index terms— sustainability index; global reporting initiative; sustainability indicators; universities; higher education institutions.

1 Introduction

any universities are striving on sustainability. One of the pathways is sustainability reporting as tool for making public all the actions on this matter. There are many reporting methodologies that have been put in place in universities, but Lozano (2011) established that the best option is the Global Reporting Initiative methodology, that although it was not designed for higher education institutions covers most of the activities except for research and teaching.

First, universities need to establish a sustainability committee that will be responsible for the sustainability policy and evaluating the data for the report. If there is an existing committee that takes care of environmental issues in the institution, this can be made in charge of the sustainability aspects.

An analysis of the sustainability reports (using the GRI methodology) presented by more than 20 universities worldwide gives a starting point and allows identifying both the most relevant and mostly used sustainability indicators. The list of performance indicators revealed can help higher education institutions drafting the first sustainability report and establishing a milestone for future sustainability reporting.

2 II.

3 Literature Review

Before mentioning the methodologies to determine the sustainability indexes for universities, there is the need to define or make an approach to the definition of a Sustainable University and its implications. According to Velasques, Mingua, Platt & Taddei (2005), a Sustainable University is defined as a higher education institution, as a whole or a part, that tackles, involves and promotes, at a regional or global level, the mitigation of the negative environmental aspects, economic, social and health related, generated by the use of resources for the purpose of teaching, researching, government, extension and work in society in ways that it helps society make its transition towards a sustainable way of life.

The process for the transformation of a higher education institution towards a Sustainable Institution starts, theoretically speaking, according to Velasquez et al. (2005), when someone or a group of persons in the institution dreams or envisions that the members of it (including stakeholders) behave according to the philosophy of sustainable development defined by the Brundtland Commission in 1987.

The model of Sustainable University, according to Velasquez et al. (2005) supposes the conformation of a sustainability committee responsible of creating and establishing the policy, objectives and goals in a way that all of the stakeholders can understand them. The most important task of the committee is creating the sustainability policy for the institution.

According to Bauer (2004), for an effective sustainable development in an institution, it must be permeated to all aspects of the university. Rogers (2004) found that authors in this matter conclude that a sustainable campus must incorporate educational and operative elements in its design. Velasquez et al. (2005) established that in order to disseminate sustainable development along the university, the people involved in the initiative of the sustainable university must improve its knowledge in subjects related to it. On the other hand, the use of technologies that allow a reduction of the negative environmental impacts in a local or global level is a must and requires being done according to the level of implementation of the initiative. It needs to be recalled that increasing the level of knowledge about sustainable development does not produce immediate results.

The model of the sustainable university, according to Velasquez et al. (2005), cannot be completed adequately without defining the appropriate tools to measure, analyse and control the performance of the sustainable initiatives. In organizations, the GRI methodology offers a variety of indicators to diagnose the sustainability performance (Velasquez et al., 2005). Nevertheless, according to Lozano (2004;2006), this methodology was never developed for universities.

It is worth mentioning, that according to Shriberg (2002)

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There are many methodologies used by universities to report sustainability indicators. According to Lozano (2011) the most used guides include the ISO 14000 series (especially ISO 14031), EMAS (ECO-Management and Audit Scheme), Social Accountability 8000 standard and the GRI guidelines. Among the different guides, the best option, according to Hussey et al. (2001), Lozano (2006) and Morhardt et al. (2002), is GRI (Global Reporting Initiative), although it is important to mention that this methodology was not developed by universities and that is the reason why it requires being adapted to activities performed in these institutions (Lozano, 2011). One of the required modifications is the inclusion of an education dimension, followed by the core competences of universities (Lozano, 2006). The indicators are organized in different categories that answer to specific aspects of the activities performed by the organization. According to the GRI Indicator Hierarchy (GRI, 2011) the environmental dimension relates to aspects such as materials, energy, water, biodiversity, emissions, waste, procurement, transportation and legislation compliancy, among others. Table 1

The sustainability reports developed under the GRI 3.1 methodology are classified according to the grade of application that are defined with a grade in letters by the categories C, B and A with the option "+" for each measured category that is communicated externally. In the GRI methodology it can be observed that if a business reports the information of 10 indicators, including at least one per dimension (Economic, Environmental and Social), the score, complying also with the profile and management information required, is "C"; but if the report includes a set of 20 indicators, with at least one per dimension, the score is "B". It is supposed then, that if universities using this methodology should at least try to report indicators to obtain a "C" and make the report public to declare its sustainability according to GRI 3.1 methodology.

The GRI methodology has performance indicators that are not relevant to the activities of the universities, and on the other hand, it does not have indicators that show the actions performed in activities like research and teaching, as proposed by Lozano (2006). The main indicators for the curricular components as well as for teaching proposed by Lozano (2006) include aspects related to sustainability as part of the curricula and the research activities. It is worth mentioning that there is no GRI methodology for Higher Education Institutions and the indicators shown are a proposal to measure the sustainability in universities.

On the other hand, Lozano (2011) developed a list of 12 universities that have published their sustainability reports using the GRI methodology, based on an internet search in the universities' webpages, the GRI website (www.globalreporting.org) and a list developed by the author in Lozano (2006). The list is included in Table 2 and was very helpful to reference other universities that use the GRI methodology (see Table ??). From the analysis done to the sustainability reports of the universities, Lozano (2011) reported that there is a tendency documenting the environmental and economic indicators. The economic dimension reporting can be as a result of using the financial information available from the annual reports. The focus on the environmental dimension can be as a result of the environmental connotation of sustainability (Arkinson, 2000; Ostanza, 1991; Diesendorf, 2000; Fadeeva, 2004; Goldin & Winters, 1995; Hart, 2000; Reinhardt, 2004). Nevertheless, this result can represent that the environmental issues are easier to measure, while the social aspects are more immature (Salzmann et al., 2003), making the difficult to monitor, establish and analyze (Lozano, 2011).

From this search, a new revision of the sustainability reports of the mentioned universities (Table 2 and Table 3) was made in order to determine the tendency in the indicators used. As well as what Lozano (2011) reported, it was found that the indicators most presented are in the economic and environmental dimensions. Nevertheless, it could be observed the use of indicators belonging to the social dimension; although it is worth mentioning that in this dimension the indicators less used belong to society performance (SO) category. These results are commented in broader detail in section 1.3.

According to Lozano (2011), the universities show great advances on the environmental indicators, especially

in those that are related to the use of materials, source separation of waste, energy and water consumption, water discharges and solid waste. Nevertheless, there is still work to be done in areas like biodiversity, supplier management, products and services, as well as environmental laws and regulation compliance indicators.

Since the environmental dimension is the most quantified in the sustainability reports reviewed, an analysis of the indicators was made in order to establish the best (the most reported) indicators to be used and serve as referents by universities starting the sustainability reporting path and trying to define sustainability indicators. A normalization of the indicators was not found, which makes it difficult to compare the environmental performance of the different universities nor making a benchmark study. To mention an example, some universities refer their energy consumption to the kWh unit, others to the kWh/m², and few others to the kWh/FTE (FTE: Full Time Equivalent Student) unit.

Thompson The authors used the following elements to normalize their data: FTE, net campus area and cost of the infrastructure. They also mention that among the disadvantages of normalizing the data is the fact that an indicator can hide representative information. Also, the elements to normalize have to be specified to assure that the comparison is made on the same scale or if there is no hidden information. In this sense, for a university with off-campus and face-to-face students, the FTE can only reflect the in-campus students while other universities may reference all the students enrolled in the university.

On the other hand, a review of the possible sustainability indexes was made to integrate the indicators and generate an environmental performance score or key performance indicator that could be applied to higher education institutions. In this search, methodologies like the Dow-Jones Sustainability Index and the Walmart Sustainability Index were found. Nevertheless, for the type of indexes and for the fact that these methodologies were not designed for universities, it was not possible to find one that could be applied in this context. Also, it was considered that at a starting stage where the baseline is being defined by a University it is premature to consider an index for the sustainability performance.

5 III.

6 Results and Discussion

From the analysis of the sustainability reports of the 26 universities studied, it was found that the most reported indicators by the universities, under the GRI 3.1 methodology, are those presented in Table 4, Table 5 and Table 6, where each table corresponds to one of the established dimensions (Economic, Environmental and Social). The indicators listed above resemble those that were found with a frequency higher than 50% of the universe established by the 26 sustainability reports.

7 EN -3

Direct energy consumption by primary energy source.

8 EN -4

Indirect energy consumption by primary source.

9 EN -8

Total water withdrawal by source.

10 EN -16

Total direct and indirect greenhouse gas emissions by weight.

11 EN -17

Other relevant indirect greenhouse gas emissions by weight.

12 EN -22

Total weight of waste by type and disposal method.

13 EN -28

Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations. Also, in the indicators analysis, it was found that most of the reported indicators correspond to the core categories established in the GRI methodology. It was established that only two of the non-core (additional) indicators were reported with a frequency over 50% in the different reports studied (LA-12 and PR-5). It can also be appreciated that in the case of the society indicators (SO), none of them were reported with a frequency over 50%. Nevertheless, it is worth mentioning that the mostly used indicator is SO-1.

14 Global

On the other hand, it was established that the mostly used indicator corresponds to EN-3, which is used to report the total consumption of energy by primary energy source. The other two most reported indicators are EC-1 and LA-1, which are used in the financial statement and the statistics about personnel, respectively. Table 7 presents the indicators that showed the higher frequencies during the study. The results of the study are coherent with ones presented by Lozano (2011) who states that there is a tendency in documenting the indicators of the economic and environmental dimensions. Also, it can be appreciated that universities are walking forward on the environmental dimension, but it can also be mentioned that there has been some advance in the social dimension, especially in areas related to working practices and labor performance. It is worth mentioning that although some universities use society indicators, the use of these indicators is limited and not proportional to the other two dimensions.

15 IV.

16 Conclusions

First, it is worth mentioning, as it was established in the section 1.2, that there is not an adequate sustainability index methodology developed for universities. Nevertheless, the most recommended and used is the GRI methodology, which can be complemented with additional indicators as the ones described by Lozano (2006) which are related to the teaching and research processes.

The starting point for universities is constructing the institutional profile information according to the GRI 3.1 methodology and to the initial conditions wanted to achieve by the University. In this matter, it is worth mentioning, as established by Velasquez et al. (2005), the higher education institution requires having a committee responsible for the report and the issues related to sustainability, as well as leading defining the sustainability policy for the University.

To start the sustainability index reporting process, the sustainability committee of the university needs to make a revision of the FRI 3.1 methodology. The committee also needs to start collecting all the available information that requires for the different environmental indicators. Usually, universities have the consumption data from electricity, water and waste bills. An additional effort needs to be done to establish the information related to the social and economic dimensions, although some of it may be already available, like the financial statements. In a first start, a university can obtain a C grade on its report based on the basic information, counting with a minimum of 10 indicators and at least 1 per dimension.

Besides, the main and mostly reported environmental indicators need to be continuously presented. The units of the indicators need to be expressed in the indicators, and a normalization process of the units needs to be explored, using the three reference units established by Thompson & Creighton (2005) -FTE: number of Full Time Equivalent students, Net Campus Area (number of gross square feet in campus building) and the size of endowment.

As for the economic and social dimension, it is recommended that higher education institutions running for the first sustainability report search for the required information necessary for the indicators report presented in Table 8. When a university manages to generate the information required in all the indicators shown in Table 8, the higher institution can run for a report that could be graded with B and that could be upgraded to B+ if the report is externally assured.

17 Global

18 EC-3

Coverage of the organization's defined benefit plan obligations.

19 EC-4

Significant financial assistance received from government.

20 EN -1

Materials used by weight or volume

21 EN -2

Percentage of materials used that are recycled input materials.

22 EN -3

Direct energy consumption by primary energy source.

23 EN -4

Indirect energy consumption by primary source.

208	24 EN -8
209	Total water withdrawal by source.
210	25 EN -16
211	Total direct and indirect greenhouse gas emissions by weight.
212	26 EN -17
213	Other relevant indirect greenhouse gas emissions by weight.
214	27 EN -22
215	Total weight of waste by type and disposal method.
216	28 EN -28
217	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with
218	environmental laws and regulations.
219	29 LA -1
220	Total workforce by employment type, employment contract, and region, broken down by gender.
221	30 LA -2
222	Total number and rate of employee turnover by age group, gender, and region.
223	31 LA -4
224	Percentage of employees covered by collective bargaining agreements.
225	32 LA -7
226	Rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities, by
227	region and by gender.
228	33 LA -8
229	Education, training, counseling, prevention, and risk-control programs in place to assist workforce members, their
230	families, or community members regarding serious diseases.
231	34 LA -10
232	Average hours of training per year per employee, by gender, and by employee category.
233	35 LA -12
234	Percentage of employees receiving regular performance and career development reviews.
235	36 LA -13
236	Composition of governance bodies and breakdown of employees per employee category according to gender, age
237	group, minority group membership, and other indicators of diversity.
238	37 LA -14
239	Ratio of basic salary and remuneration of women to men by employee category, by significant locations of
240	operation.
241	38 HR -4
242	Total number of incidents of discrimination and corrective actions taken.
243	39 PR -5
244	Practices related to customer satisfaction, including results of surveys measuring customer satisfaction. ^{1 2}

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Dimension	Category	Number of Core Performance Indicators	Number of Additional Performance Indicators
Economic	EC -Economic	7	2
Environmental	EN -Environmental	17	13
	LA -Labor Practices & Decent Work	10	5
Social	HR -Human Resources	9	2
	SO -Society	8	2
	PR -Product Responsibility	4	5
	Total	55	29

Figure 1: :

2

Institution	Year of Publication	Number of Pages
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Figure 2: Table 2 :

Institution different higher education institutions, the environmental Year of Publication performance indica

University of Calgary, Canada comparison between the different institutions is wanted. 2010-2011
ETH, Zürich, Switzerland 2009-

2010

Hogeschool-Universiteit, Belgium 2009-2011, Brussels

Universidad del Bio-Bio, Chile 2010

Escuela Técnica Superior de Ingenieros

Industriales, Universidad Politécnica de 2009-2010

Madrid,Spain

UniversidadeFeevale, Brazil 2011

Universidad de Cádiz, Spain 2010-

2011

Universität Bayreuth, Germany 2007-2008

Anhanguera Educacional, Brazil 2011

UNED, Spain 2009-2010

Universidad Tecnológica del Caribe, 2009

Colombia

Figure 3:

4

Figure 4: Table 4 :

5

Sustainability Indicators for Universities: Revision for A Colombian Case
difference in size, mission, budget and culture of the

Figure 5: Table 5 :

6

Year 2017
6
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Journal of Researches in Engineering

Figure 6: Table 6 :

7

J

Figure 7: Table 7 :

8

	Indicator	Frequency Range
	LA -4	
	LA -7	
	LA -10	
	LA -13	
	LA -14	
	EC -3	
	EC -4	
	EN -17	
Year 2017	LA -11 LA -12 EN -28 LA -8	51 -60%
8	HR -4 PR -5	
I		
() Volume XVII Issue V Version		
J		
Journal of Researches in Engi- neering		

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Figure 8: Table 8 :

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