Integrating the Sustainable Development Goals into the Strategy of Higher Education Institutions

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Despite the relevance of the UN Sustainable Development Goals (SDGs) and the fact that universities may make valuable contributions towards their implementation, there is a paucity of international studies which may allow an assessment of their degree of engagement or their performance against the SDGs. This paper reports on an international study among a sample of 128 members of higher education institutions (HEIs) located in 28 countries, which aimed at ascertaining the extent to which the SDGs are being integrated into the strategy of HEIs. The focus of this paper is on the means which have been deployed by various universities in order to embed or include the SDGs in their activities. More specifically, this paper explores 1) the scope of integration, 2) the organisational influences, and 3) strategic influencing factors. The research identified the fact that, whereas many organisations are aware of the need for and the relevance of sustainable development and consider it as part of their institutional settings, the same cannot be said for the SDGs, whose level of emphasis is many HEIs is comparatively somewhat limited. In addition, there seems to be a shortage of training opportunities focusing on the SDGs, which could equip university staff to handle this topic. Against this background, the paper describes some measures that may be implemented to make the SDGs more present in HEI programmes, hence maximising their contribution to addressing the global sustainability challenges.

Keywords: Higher education; SDGs; implantation; strategies; integration

1. Introduction

The Sustainable Development Goals (SDGs) reflect the 2030 Agenda of the United Nations (UN) for 2015-2030. While their predecessors, the Millennium Development Goals (MDGs), targeted developing countries, the SDGs were devised to elude the entire planet (Sachs, 2012). The 17 SDGs, formally adopted by all United Nations Member States in September 2015, expand the 8 MDGs to include a broader set of areas and actors involved as they call for collective action (Leal Filho, Shiel, et al., 2019).

Fukuda-Parr (2016, p. 44) highlights the three-year-long negation process and the main differences, “not just in the number of goals and targets, but in their very purpose, conception, and the political process that drove their elaboration”. After the UN Secretary-General Ban Ki-Moon’s high-level global sustainability panel issued a report proposing a set of Sustainable Development Goals to be adopted worldwide, Sachs (2012, p. 2206), stated that “the SDGs is an important idea, and could help finally to move the world to a sustainable trajectory”.

The 2030 agenda is not only broader but also more transformative (Fukuda-Parr, 2016). It is organised into 17 SDGs and disaggregated into 169 targets, spread over five intertwined dimensions: People, Planet, Prosperity, Peace, and Partnerships. The UN and the recent literature have called for an SDG approach that recognises the interlinkages across sectors, societal actors, and countries (Stafford-Smith et al., 2017; United Nations, 2015). In this same line of thought, Allen et al. (2019) consider the systemic impact and the level of urgency and policy gap, to present an integrated assessment approach to assist in establishing priorities in SDG targets definition. This interconnectivity of the different goals calls for interdisciplinarity (Annan-Diab & Molinari, 2017). Indeed, the field of sustainability and sustainable development research has been characterised by a substantial emphasis on interdisciplinary, with multiple emerging areas (Hassan, Haddawy, & Zhu, 2014; Suriyankietkaew & Petison, 2019). Still, this interconnectivity comes with challenges, namely when it comes to linking the various actors. The holistic approach of the SDGs has already raised some concerns in terms of the lack of boundaries and assignment of responsibilities among the governments or the unclear responsibilities of non-governmental actors (Bexell & Jönsson, 2017). In any case, sustainability efforts call for all sectors to act (García-

Feijoo, Eizaguirre, & Rica-Aspiunza, 2020), and a "paradigm shift is required at all levels of the society" (Suriyankietkaew & Petison, 2019, p. 92).

Particularly, HEIs can play an essential role in the path toward sustainable development (Leal Filho, 2011). At the same time, they have been immensely shaped by the sustainability agenda (Franco et al., 2019). On the one hand, implementing of sustainable development in HEIs needs to go beyond policy (Leal Filho, 2011). As Leal Filho (2011, p. 24) puts it,

> "university blueprints (or strategies), declarations, or action plans are useless unless they can be backed up by concrete action in one or more of the following areas: (a) curriculum greening; (b) campus operations; (c) research; (d) extension (i.e. continuing education and further education programmes); (e) concrete projects."

On the other hand, attempts to embed sustainability into HEI policies, curricula, and practices will only be effective if they are strategically supported by a coordinated and integrated governance approach (Franco et al., 2019). This means that HEIs are systemically rethinking their core activities to address the 2030 Agenda in their strategy (Paletta & Bonoli, 2019). Literature reveals cases of integration of sustainable strategies in specific HEIs (Mori Junior, Fien, & Horne, 2019; Paletta & Bonoli, 2019; Purcell, Henriksen, & Spengler, 2019; Ramísio, Pinto, Gouveia, Costa, & Arezes, 2019). As well as at a national level (Bieler & McKenzie, 2017; Do, 2020; Farinha, Caeiro, & Azeiteiro, 2019; Larrán, Herrera, & Andrades, 2016; Shawe, Horan, Moles, & O'Regan, 2019). Despite several positive cases, there is still a lack of a systemic approach to explaining how sustainable development is integrated into HEI (Shawe et al., 2019). Leal Filho et al. (2019) also concluded that more has to be done by HEI in terms of strategic planning for sustainable development, including a "whole systems" perspective to the planning and implementation.

There is no dispute over the fact that universities should continue to engage in implementing sustainability. But not much literature on the extent to which higher education institutions are taken the SDGs into account as part of their programmes. Therefore the added value of this paper is that it intended to find out the current emphasis being given to the SDGs, as part of (and not instead) of general sustainability efforts.

In a cross-country study, this paper aims to explore how HEIs have been integrating the Sustainable Development Goals into their strategy in a systemic and holistic way. This is achieved by employing an international study among a sample of 128 HEIs, which aimed at ascertaining: 1) the scope of integration, 2) the organisational influences, and 3) strategic influencing factors.

2. Integrating the sustainable development goals into the strategy of HEIs

With a combination of education, research, and societal mission, HEIs play a central role in addressing the UN's challenges regarding achieving the ambitious goals and targets designated by Agenda 2030 (Gratzer et al., 2019). Thus, according to Mori Junior et al. (2019), universities are crucial to achieving the SDGs. These institutions are responsible for providing the next generation with knowledge and capabilities to address sustainability challenges and opportunities. Furthermore, universities are "uniquely placed to lead the cross-sectoral implementation of the SDGs, providing an invaluable source of expertise in research and education on all sectors of the SDGs…" (El-Jardali, Ataya, & Fadlallah, 2018, p. 1). However, literature focused on universities' engagement with the SDGs is still scarce (Leal Filho, Skanavis, et al., 2019), thus motivating the need for continuous research on how HEIs could be agents of change by putting the SDGs and sustainability into practice.

As it has been previously argued, in order to be effective, the SDGs should be taken into account at the time of the university strategies formulation and design and in the implementation of processes and practices. These decisions will most likely impact various stakeholders, which is why Mori Junior et al. (2019) affirm that universities should use their expertise and skills to influence other actors to adopt more sustainable policies and practices to achieve the SDGs.

Accordingly, El-Jardali et al. (2018) state that in the process of universities' engagement with the SDGs, for it to provoke a positive societal impact, it is necessary to foster partnerships with governments and communities. At this aim, it is necessary to work with policy-makers and other stakeholders to identify priorities and constraints, determine feasible options, and assess the measures implemented.

In terms of the relation and application of the SDGs, the role of universities is clearly related to SDG 4 (Quality education). However, these organisations can also contribute to achieving other goals such as sanitation and environment, innovation, and global partnership (Utama et al., 2018). Leal Filho et al. (2019, p. 287) affirm that some of the targets within SDG4 "clearly call for action by universities, and many others have direct significance to learning and teaching activities within HEI. Thus, education seems to be an important driving force aligning society with the spirit of SDGs". Nevertheless, SDG 9 (Industry, innovation and infrastructure), SDG 12 (Responsible consumption and production), SDG 16 (Peace and justice strong institutions) and SDG 17 (Partnerships to achieve the goal) are directly connected with the role of HEIs (Utama et al., 2018).

Universities are both implementing and reporting their SDGs-related measures. Several case studies have been carried out, evidencing, in the real context, how universities could contribute to achieving a specific goal or embrace the SDGs

framework within their institution. For instance, the work by Rebelatto et al.(2019) shows how Passo Fundo University in Brazil has been contributing to the targets of SDG 7. It is well-known that there are several manners in which universities can engage with energy management, such as the rational use of energetic resources, energy efficiency, and increasing the use of renewable energy – in their teaching, research, campus operations, and outreach dimensions. This study focused on three initiatives: LED lighting, incorporating solar photovoltaic generation, and the free energy market. Brandli et al. (2019), working in the same organisation, conclude that integrating actions related to SDG 15 (Life on land) requires assistance from the university environment and the local community. Also, it is found that the organisation should acknowledge the need to train professionals to work in areas of consumption, soil conservation, and climate change.

Other case studies concerning SDGs implementation in HEIs reports on their incorporation in the curricula by Aleixo et al. (2020), the examination of students' knowledge regarding the SDGs by Zamora-Polo et al. (2019), the development of an instrument to map studies that address SDGs topics by Körfgen et al. (2018), SDGs assimilation in campus operations by Mawonde & Togo (2019), and the university's role as transformational engines to deliver the SDGs by Purcell et al. (2019).

In terms of adopting the SDGs on a more systematic and strategic level, during the year 2017, the Royal Melbourne Institute of Technology (RMIT) in Australia made a public commitment to support and disseminate the principles of the SDGs by undertaking research directed at developing sustainable solutions, providing education related with sustainability issues, equipping the campuses adequately, and reporting on activities that support the implementation of the SDGs (Mori Junior et al., 2019). The case of the Ashridge Hult Business School in the United Kingdom is also worth

mentioning, given that its mission, strategy, governance, and research are in line with the 2030 Agenda. Their expertise contemplates all SDG goals, and 10 out of 17 are closely linked to teaching (SDG 4) and sustainable campus (SDGs 3, 5, 6, 7, 8, 12, 13, 15, and 16) (Ndubuka & Rey-Marmonier, 2019).

Another interesting project was developed in Austria by the Universitäten und Nachhaltige Entwicklungsziele (UniNEtZ). It aims to support the political agenda by integrating sustainability into research and education and reinforcing collaboration between national HEIs. The main objectives are: to develop a catalogue of options on how the SDGs could be achieved; to address SDGs in universities in the areas of research, teaching, and management; and to build capacity amongst academics, researchers, non-academic staff, and students regarding the SDGs (A Körfgen et al., 2019). Even more, this project developed a mapping tool to list all publications related to the topic in the cope of an interdisciplinary process. The research was based on projects and publications related to the SGDs from 13 universities. As an output of the mapping process, 15.000 publications and 17.000 projects emerged from 2013 to 2017.

Additionally, international initiatives have flourished to support SDGs implementation in the HEIs realm, such as the Higher Education Sustainability Initiative and the Principles of Responsible Management Education. Similarly, HEIs themselves have created networks to focus on particular areas such as research to promote the SDGs (e.g. HAW Hamburg in Germany with the World Sustainable Development Research and Transfer Centre and the European School of Sustainability Science and Research) (Leal Filho, Shiel, et al., 2019).

Furthermore, the SDG Accord is a worldwide enterprise developed by the Global Alliance, which was launched in 2017 for tertiary education to show its commitment to the SDGs. According to the 2019 Annual SDG Accord Report, it has the

official participation of 110 organisations and 103 support institutions located in 85 countries (The Global Alliance, 2019). In such report, the results of a survey of 51 institutional signatories – most of them being placed in the United Kingdom – are presented:

(1) 70% of institutions engaged in the study have mapped their SDGs undertakings – entirely or partially, and 62% report on their SDGs advancements.
(2) The scope in which the majority of the organisations are performing well is in strategic and policy SDGs commitment in their top management, governance, and staff levels.
(3) They rate themselves as the poorest in support in society and partnership areas.

Consequently, the supremacy of the case studies methodological approach on the topic, the UniNEtZ project output, and Leal Filho et al. (2019) findings regarding the fact that literature on HEIs engagement with the SDGs. It suggests the need to further develop international research regarding a comprehensive mapping of the SDGs' degree and manner of integration at HEIs worldwide. In such a way, it is possible to collect and systematise information to understand the significant "players" and how this integration has been at a strategic level besides the more operational level. The latter is highly relevant as it showcases the latest developments, trends, and current strengths and weaknesses in the SDGs' transformational processes within HEIs internationally, thus reinforcing feasible pathways for universities pursuing this major challenge.

Indeed, in general, integrating sustainability into strategy is not free of challenges, and there are several internal and external factors that may influence this process. In a literature review about the integration of sustainability into strategic management, not specific to the context of HEIs, Engert et al. (2016) found three emergent issues. First, there may be organisational influences, including internal aspects

such as size, scope, and structure. Even if there seems to be no apparent effect on the size or scope, the need to modify the organisational structure to incorporate the sustainable development aspects may influence the integration. External aspects such as industry type, industry structure, or position within the industry could also affect it. Second, Engert et al. (2016) synthesised internal and external drivers.

On the one hand, internal drivers include cost reduction, economic performance, innovation, social and environmental responsibility, risk management, corporate reputation, and quality management. On the other hand, external drivers include legal compliance and competitive advantage. Finally, supporting and hindering factors for sustainability emerged from the literature review conducted by Engert et al.(2016). These include management control, stakeholder engagement, organisational learning and knowledge management, transparency and communication, manager attitude and behaviour, organisational culture, complexity, and investments. Overall, one can assume all the factors – drivers as well as hindering and supporting factors - can have a strong or weak influence in integrating sustainability into strategy.

3. Methods

The study aimed to understand the extent to which HEIs, in their approach to sustainability, are integrating the SDGs into their strategic management. To achieve this, we will explore how the studied HEIs train their academic community, the organisational structure changes to implement the UN SDG, the influencing factors, and the future needs to promote the HEIs' engagement regarding UN SDG. Based on a comprehensive literature review on SDGs at HEIs and issues related to the integration of sustainability into strategic management, a set of items was identified, and a survey was designed. The instrument comprises 23 variables divided into three parts. The first

part of the questionnaire was designed to collect general information related to HEIs' profiles. The second part was focused on gathering data related to the integration of UN SDG into HEIs strategy. The third part encompasses a set of items designed to identify and describe the main strategic influencing factors related to the UN SDG implementation and future actions demanded by HEIs to engage in this implementation.

The survey was initially designed in English, translated into Portuguese and Spanish, and then piloted and pre-tested by a panel of co-authors and external experts. The final version of the survey was implemented through the Google Forms system and distributed by email, collecting responses 4th May to 17th July). By using the snowball sampling strategy, the instrument was initially shared with the Inter-University Sustainable Development Research Programme (IUSDRP) and also within each co-author's institution. In addition to members of IUSDRP, the survey instrument was circulated among persons who previously attended IUSDRP events (online and physical ones). This helps to understand why countries such as Lybia, Zimbabwe, Honduras, and Ecuador are represented in the study. The questionnaire was answered on a voluntary basis and with a guarantee of anonymity to the respondents. The unit of analysis of this study is the institutions of higher education and not the individuals who answered the questionnaire.

To summarise and aggregate the information about SDGs in HEIs' strategies, the set of statistical analyses adopted, among which descriptive statistics, multivariate analysis, through principal component analysis - PCA, and reliability analysis, using the Cronbach Alpha.

In total, 128 responses were received from 28 countries located on six continents: Africa (Libya, Nigeria, South Africa, Zimbabwe); Asia (China, Malaysia, Philippines); Europe (Estonia, Germany, Latvia, Lithuania, Portugal, Republic of

Kosovo, Spain, Sweden, Ukraine, United Kingdom); North America (Cuba, Honduras, Mexico, United States); Oceania (Australia); and South America (Argentina, Brazil, Chile, Colombia, Ecuador, Venezuela) as shown on Figure 1.

Figure 1 - Geographic distribution of respondents (here)

The majority of respondents (85.94%) belong to South America and Europe. Most South American responses are from Brazil (24.2%) and Colombia (25.8%). In the work of Blanco-Portela, R-Pertierra, Benayas, and Lozano (2018), which aimed to identify drivers and barriers to implementing SD actions in Latin American HEIs, it was found that those Latin American institutions have similar patterns of drivers and barriers to sustainability change as the ones reported for universities in another geographic context.

For the scope of the study, Figure 2 illustrates the main sample features of the respondents: (a) gender, (b) academic position, and (c) type of institution.

Over 70% of the participants are from a public HEI. Sixty-two per cent of the respondents identified themselves as female, highlighting the representativeness of women committed to the issues of sustainability of HEIs.

Figure 2 - Characterization of respondents (gender, academic position and type of institution) (here)

An academic career in universities has different configurations in each country; however, many academic jobs include teaching and conducting research in professor or lecturer positions. There was a preponderance of academic staff (65.6% among the surveyed individuals). Over half (55%) of the participants were academic staff (professors, teachers, lecturers), and 26% were researchers with knowledge about sustainable development research. Among the Administrative staff individuals, the most frequently cited positions were director of sustainability sector, committee or project, planning director, graduate coordinator, head of department or school and dean.

4. Results and discussion

In order to explore the integration of the SDGs into the strategy of HEIs, this section presents three components the results of the prioritising fields into the organisational structure as the scope of integration; the strategic influencing factors in achieving the UN SDG integration; and finally the future needs to promote the HEIs engagement regarding UN SDG.

4.1 Integration of Sustainable Development Goals into the strategy of HEIs

About half of the sample reported having performed any organisational change to accomplish the SDGs implementation. These organisational changes included, among others, using tools to monitor and report on the SDGs implementation (43%), a specific plan to deal with the SDGs (38%), and designing an agenda for implementing the SDGs (32%). Some respondents also referred to other examples of organisational changes. Among them, one could highlight "the institutionalisation of a University Environmental System under the domain of the organisation in charge of the Quality Assurance System" or the establishment of an "Environmental Sustainability Board".

When asked about how they perceived the positioning of their HEI in terms of the extent of incorporation of sustainability into the institutional strategy, compared to other HEIs in the country, most of the respondents considered their HEI to be doing equal (34%), better (33%) or much better (16%) than most other HEI in their country. This reveals that the sample represents HEIs that are at the forefront in this matter.

4.2.1 Scope of integration

First of all, the vast majority of the respondents in the sample confirmed that their HEI considered sustainable development as a whole as part of the institutional mission (76%), as part of their vision or goals (83%), as part of their operations (81%) and as a critical driver for the strategic plan (72%). As depicted in Figure 3, these percentages decrease when the question is specifically about the integration of SDGs.

Figure 3. Scope of integration – strategy and operations (here)

Similarly, 85% of the respondents acknowledge formal policies and initiatives on sustainability issues in general, but only around 60% identify them with the SDGs (Figure 4). This is in line with the percentage of respondents that refer to the disclosure of documents in the public domain showing the work of the HEI on the SDGs. The integration of the SDGs seems to be increasing. However, as outlined by Franco et al. (2019), in order to be effective, the incorporation of sustainability into policies, curriculum, and practices of HEI needs to be strategically supported by a coordinated and integrated governing approach. This is aligned with Leal Filho (2011), who argues that implementing sustainable development in HEIs needs to go beyond policy. Also, Poon (2017) found that despite the clear strategic aims and initiatives, there was a

disconnection between policy development and policy implementation, suggesting that to explore the integration of the SDGs into strategy, we need to go beyond the existence of a plan or policies.

Figure 4. Scope of integration – policies and initiatives, and disclosure (here)

The extent to which HEIs offer SDG training programs is limited (Figure 5). Virtually in half of the cases, respondents identified there is not at all or, to a small extent, training for both academic and administrative staff. In In the case of students, the mean slightly increases, showing that almost 60% where there are training programs on the SDGs, at least to a moderate extent.

Figure 5 - Scope of integration – training (here)

4.2. The emerged model – Strategic influencing factors

The survey, designed from a literature review, allowed the authors to explore how the UN SDG initiatives are integrated into the strategic management of HEIs. The validity of the scale and the emerged model after the principal component analysis are shown in this subsection.

4.2.1. Construct validity

A principal component analysis was performed on the 19 items to reveal the latent structure of the strategic influencing factors for SDG implementation in HEIs. The 19

items were grouped into three components, as shown hereafter. The KMO, as a validity indicator for exploratory factor analysis, was 0,943 and all KMO values for individual items were greater than 0.5 (Field, 2018; Hair, Black, Babin, & Anderson, 2014). Bartlett's test of sphericity was also significant ($\mathcal{X}^2(171) = 2490.858, p < .05$). An initial analysis was run to obtain eigenvalues for each factor in the data. The scree test criterion was used to determine the optimum number of factors that kept an expressive amount of unique variance (Cattell, 1966). Thus, considering the inflexion point of the plotted curve, three factors were selected and, in combination, explained 76,30% of the variance, explained by the extracted components after varimax rotation. In **Erro! A o rigem da referência não foi encontrada.**, the three component loadings rotated are shown. All the items from the survey loaded above the acceptable value of 0.4; thus, they were retained. The reliability analysis revealed that Cronbach's Alpha had values much higher than the acceptable level of 0.6 for all components (Field, 2018).

Table 1 - Results of Principal Component Analysis and Reliability Analysis (here)

4.2.2. Design and performance of the model

Figure 6 shows the emerging model that this research proposed from the PCA results. Three general influencing factors compose the HEIs' strategic management that allows the integration of the UN SDG. They are 1) sustainable breeding culture composed of ten items that converge cultural, governance and leadership aspects, 2) management integration which embraces the institutional projection; and 3) the organisational value that comprises financial issues, legal and reputation aspects, and competitive advantage.

Figure 6. Model for SDG integration into HEIs' strategic management (here)

Respondents were asked how they would rate the influence of several factors on the integration of the SDGs into the strategy of their HEI. As noted before, these factors are derived from the work of Engert et al. (2016), which separates them into drivers and supporting and hindering factors. However, for the purpose of this paper, these factors were combined, adapted, and named as strategic influencing factors, and they relate to strategy – resources, capabilities, processes, and systems. In the following paragraphs, each component is analysed considering the answers' frequencies and the item's incidence in the component.

4.2.2.1 Sustainability Breeding Culture

The first component, Sustainability breeding culture, is composed of ten items. Sustainability culture is defined by Stephenson (2018) as a set of beliefs and values of social groups, as well as their language, forms of knowledge, common sense, material products, interactional practices and lifestyle established and held by a given social group (Figure 7). The cited author explores the cultural formation underpinning sustainability outcomes in the field of energy consumption but also reports studies that intend to understand how sustainability culture affects consumption, production, and governance, to name a few possible areas of application of this concept. Figure 7 shows the performance achieved by the ten items that make up the Sustainability breeding culture component.

Figure 7 - Sustainability breeding culture component percentage (here)

Among the most influencing strategic factors that concur to sustainability, breeding culture is the possibility of fostering existing attitudes or behaviours of students towards sustainability (mean 3.77, SD 1.17), the internal commitment to social and environmental responsibility (mean 3.76, SD 1.12), and the possibility to foster sustainable development innovation (mean 3.68, SD 1.08), as shown on Table 1. The results are consistent with the work of Pucci et al. (2018), which analyse how proactive sustainable behaviour might engage multiple stakeholders in developing eco-innovations, enhancing value both for the organisation and for the stakeholders directly or indirectly involved in the organisation's activities.

The influencing factor related to breeding a sustainability culture that scored lower was the possibility of fostering the current level of organisational learning and knowledge management (mean 3.34, SD 1.19), and this value is above the midpoint of the scale. Cotton and Alcock (2013) consider that the embedding of DS in HEIs has been far from straightforward and been patchy – both in terms of curriculum dissemination and in terms of the understandings the meaning of SD in HEIs. Adams, Martin, and Boom (2018) suggest that the success in implementing SD in HEIs can be measured by the level of incorporating aspects of the DS in their organisational culture. The literature shows the role of the internal stakeholders in fostering sustainability in HEIs. For instance, Alkhayyal et al. (2019) concluded about the critical role that faculty members can play in strengthening awareness and knowledge about sustainability in HEI. When it comes to the students, Zamora-Polo et al. (2019) found that students still show low levels of knowledge about the SDGs. HEIs in our sample seem to see the integration of the SDGs into strategy as a way of fostering students' engagement.

4.2.2.2– Management integration

The second component, shown in Figure 8, is called management integration. It was composed of four items with an overall mean of 3.27, being the component with the lowest overall score on the proposed mode.

Figure 8 - Management integration component frequencies (here)

The better-scored item of this second component was promote quality management (mean 3.48, SD 1.18). It was followed by the possibility of improving existing management control systems and tools (mean 3.48, SD 1.18), revealing the importance of the integrating SD system into the institutional management system with proper institutionalised targets and established performance monitoring procedures. The results are in line with authors such as Yuan and Zuo (2013) and Leal Filho et al. (2019), that conceive an HEI as a complex and holistic structure composed of various interdependent subsystems that need a systematic management approach in order to make the required transformation to become a sustainable university. At this aim, HEIs must find ways to make SD an integral part of the institutional framework (Lozano, Lukman, Lozano, Huisingh, & Lambrechts, 2013). The level of complexity required for the integration process (mean 3.10, SD 1.17) is challenging to manage and control SD in HEIs. For embedding sustainability into an organisation's culture, it is necessary to integrate SD into the core of the organization's strategies and processes (Cotton & Alcock, 2013).

This component revealed to be influencing the integration of the SDGs into the HEI strategy is related to more structural aspects of the management integration

process. That is to say, the possibility to enhance the quality management systems, as well as the level of complexity in the integration process itself and, finally, the level of investment required for the integration process.

4.2.2.3 – Organisational Value

Figure 9. Organisational Value component frequencies (here)

Among all the strategic influencing under the organisational value component, shown in Figure 9, the only influencing factor that scored higher (mean 3.65 and below) was the potential impact of reputation. This finding may be linked to the findings from Zorio-Grima (2020), who found that public status and prestige, combined with other factors, may help explain the phenomenon of the integration of sustainability in HEI.

All the other factors in this component scored lower (mean 3.35 and below), i.e., the expected economic performance and the possible cost reduction, the existence of laws, regulations and legal compliance, and the competitive advantage in relation to other HEI. These are also the ones scoring lower overall in the model. In line with this, literature exploring sustainability integration into the strategy of HEIs reveals limited attention to the notion of competitive advantage. Some exceptions include Čirjevskis (2015) and Ghinea et al. (2017).

In general, these results seem to suggest that, in the case of HEI, the integration of the SDGs into the strategy is more driven by the potential to engage various internal stakeholders, combined with a sense of responsibility and orientation to the market in

terms of the reputation and innovation for sustainability, than driven by regulative or economic factors.

4.3 Implications for the future: Fostering the implementation of the SDGs in HEIs

Finally, the questionnaire aimed to explore the view of respondents concerning the ways to encourage HEIs to further engage in the implementation of the SDGs (Figure 10). Most respondents (69%) believe more specific government support for implementing the SDGs is needed. As one of the respondents noted, “Universities are aware of their role in implementing the SDGs, but government policies are much slower than the implementation of the SDGs”.

Figure 10 - Fostering the implementation of the SDGs in HEIs (here)

To a much lesser extent, the respondents refer to the need for more institutional support (27%), financial support (15%) or training (13%). Engagement of administrative staff, students and academics do not seem to be an issue, suggesting that this engagement already exists. To encourage HEIs to further engage in the implementation of the SDGs, some respondents further suggested the importance of the “institutional commitment (e.g., the rector)” or the “incorporation of ODS criteria into institutional accreditation processes”. As put by one of the respondents, there needs to be “cultural and generational changes as current top management does not seem to actively promote related values within the organisational culture”. As other respondents refer, “the culture of sustainability and development must be constant and spread by all means of communication, so that it becomes part of all our actions in society.”;

ultimately, “the interaction between educational institutions and society to discuss SDGs is a fundamental principle.” Along these lines, another respondent highlighted that the “Agenda 2030 and its goals, reinforce the role of universities as strategic allies for sustainable development”. Still, and despite the outstanding examples out there, there is still a long way to go. As noted by one student, “more support and understanding from all involved in the academic community about the importance of SDG implementation is needed so that this is an incentive for the institution to develop these issues with more commitment.” And networks can play a role, as illustrated by one of the respondents: “the existing networks of universities strengthen their organisations, objectives and commitments and make more visible to society what they do in relation to sustainability and environmental sustainability.”

5. Conclusions

The paper has reiterated the many benefits that may be brought about by incorporating of the UN Sustainable Development Goals in the teaching, research, and operational practices of higher education institutions. The wide range of themes the SDGs cover, and the many associated issues provide a relatively fertile ground for the use of this comprehensive body of information to the advantage of HEIs.

The paper has identified a number of trends. First of all, it seems that the advantages of using the SDGs are not so evident. Whereas the majority of the sampled organisations confirmed that they consider sustainable development as part of the institutional mission and as part of their vision or goals, many stated that the integration of the SDGs as part of their operations is not yet part of their regular routine. Also,

respondents expect greater support from government agencies to pursue the SDGs in their organisations better.

This paper has some limitations. One of them is the fact that the sample of 128 members of higher education institutions is not large enough to allow definitive conclusions to be made. Also, the study was performed over a time span of a few weeks, the participation was voluntary, and it hence relied on the interest of individuals to contribute to it. Nevertheless, despite these constraints, the research allows a rough profile of the current emphasis on the SDGs in the work of HEIS to be built. This is especially so since it collected and reported on data from 28 countries spread across all geographical regions.

The implications of the papers are threefold. First, it addresses the need for international studies assessing universities' degrees of engagement and their performance against the SDGs. Secondly, it sheds some light on the extent to which the SDGs are being integrated into the strategy of HEIs. In addition, it points out the strategic influencing factors which may determine whether or not (and to which extent) some HEIs engage (or not) with the SDGs.

In respect of the measures which may be implemented so as to make the SDGs more present in HEI programmes, mention can be made to the need for embedding the SDGs into policies, curriculum, research and practices of HEIs, so as to maximise the benefits such integration may bring about. Added to this is the need for SDG training programmes, whose existence seems somewhat limited to date. The fact that half of the sampled institutions mentioned that training on this topic is currently limited is a reason for concern since lack of information and/or awareness is known to hinder efforts to place the topic more centrally on the agenda of HEIs.

Overall, the responses from the sampled countries provide valuable insights into the nature of the nexus HEIS-SDGs, the scope of these relations, and some of the ways it can be improved. It is evident from the study that urgent action is needed so as to place the SDGs more centrally in the teaching, research and operational practices of HEIs, better equipping them to handle the many challenges posed to them presently and in the future.

This paper has illustrated the fact that much can be gained by providing a greater emphasis on the SDGs in a higher education context. The many efforts currently being undertaken internationally towards implementing of the SDGs suggest that greater involvement from the higher education section is required, especially in a world influenced by pandemics, climate change, exacerbation of poverty and social inequalities. Addressing these problems also requires more interdisciplinary research across hierarchical levels and geographical and political boundaries. Here, universities have a pivotal role to play.

6. References

Adams, R., Martin, S., & Boom, K. (2018). University culture and sustainability: Designing and implementing an enabling framework. *Journal of Cleaner Production*, *171*, 434–445. https://doi.org/10.1016/j.jclepro.2017.10.032

Aleixo, A. M., Azeiteiro, U. M., & Leal, S. (2020). Are the sustainable development goals being implemented in the Portuguese higher education formative offer? *International Journal of Sustainability in Higher Education*, *21*(2), 336–352. https://doi.org/10.1108/IJSHE-04-2019-0150

Alkhayyal, B., Labib, W., Alsulaiman, T., & Abdelhadi, A. (2019). Analyzing sustainability awareness among higher education faculty members: A case study in Saudi Arabia. *Sustainability (Switzerland)*, *11*(23). https://doi.org/10.3390/su11236837

Allen, C., Metternicht, G., & Wiedmann, T. (2019). Prioritising SDG targets: assessing baselines, gaps and interlinkages. *Sustainability Science*, *14*(2), 421–438. https://doi.org/10.1007/s11625-018-0596-8

Annan-Diab, F., & Molinari, C. (2017). Interdisciplinarity: Practical approach to advancing education for sustainability and for the Sustainable Development Goals. *The International Journal of Management Education*, *15*(2), 73–83. https://doi.org/10.1016/j.ijme.2017.03.006

Bexell, M., & Jönsson, K. (2017). Responsibility and the United Nations' Sustainable Development Goals. *Forum for Development Studies*, *44*(1), 13–29. https://doi.org/10.1080/08039410.2016.1252424

Bieler, A., & McKenzie, M. (2017). Strategic Planning for Sustainability in Canadian Higher Education. *Sustainability*, *9*(2), 161. https://doi.org/10.3390/su9020161

Blanco-Portela, N., R-Pertierra, L., Benayas, J., & Lozano, R. (2018). Sustainability leaders' perceptions on the drivers for and the barriers to the integration of sustainability in Latin American Higher Education Institutions. *Sustainability (Switzerland)*, *10*(8). https://doi.org/10.3390/su10082954

Brandli, L. ., Salvia, A. L., Rocha, V. T., Mazutti, J., & Reginatto, G. (2019). The Role of Green Areas in University Campuses: Contribution to SDG 4 and SDG 15. In W. Leal Filho (Ed.), *Universities as Living Labs for Sustainable Development*. Springer, Cham.

Cattell, R. B. (1966). The Scree Test For The Number Of Factors. *Multivariate Behavioral Research*, *1*(2), 245–276. https://doi.org/10.1207/s15327906mbr0102_10

Čirjevskis, A. (2015). Sustainability in Higher Education: Discourse on Dynamic Capabilities of Privately Run Higher Educational Institutions (HEI) in Latvia. *Journal of Security and Sustainability Issues*, *5*(1), 111–122. https://doi.org/10.9770/jssi.2014.5.1(9)

Cotton, D. R. E., & Alcock, I. (2013). Commitment to environmental sustainability in the UK student population. *Studies in Higher Education*, *38*(10), 1457–1471. https://doi.org/10.1080/03075079.2011.627423

Do, N. M. (2020). An overview of strategic responses of Vietnamese higher education institutions. *International Journal of Educational Management*, *34*(1), 35–44. https://doi.org/10.1108/IJEM-02-2019-0074

El-Jardali, F., Ataya, N., & Fadlallah, R. (2018). Changing roles of universities in the era of SDGs: rising up to the global challenge through institutionalising partnerships with governments and communities. *Health Research Policy and Systems*, *16*(1), 38. https://doi.org/10.1186/s12961-018-0318-9

Engert, S., Rauter, R., & Baumgartner, R. J. (2016). Exploring the integration of corporate sustainability into strategic management: a literature review. *Journal of Cleaner Production*, *112*, 2833–2850. https://doi.org/10.1016/J.JCLEPRO.2015.08.031

Farinha, C., Caeiro, S., & Azeiteiro, U. (2019). Sustainability Strategies in Portuguese Higher Education Institutions: Commitments and Practices from Internal Insights. *Sustainability*, *11*(11), 3227. https://doi.org/10.3390/su11113227

Field, A. (2018). *Discovering Statistics Using IBM SPSS Statistics* (J. Seaman (ed.); 5th ed.). SAGE Publications.

Franco, I., Saito, O., Vaughter, P., Whereat, J., Kanie, N., & Takemoto, K. (2019). Higher education for sustainable development: actioning the global goals in policy, curriculum and practice. *Sustainability Science*, *14*(6), 1621–1642. https://doi.org/10.1007/s11625-018-0628-4

Fukuda-Parr, S. (2016). From the Millennium Development Goals to the Sustainable Development Goals: shifts in purpose, concept, and politics of global goal setting for development. *Gender & Development*, *24*(1), 43–52. https://doi.org/10.1080/13552074.2016.1145895

García-Feijoo, M., Eizaguirre, A., & Rica-Aspiunza, A. (2020). Systematic Review of Sustainable-Development-Goal Deployment in Business Schools. *Sustainability*, *12*(1), 440. https://doi.org/10.3390/su12010440

Ghinea, V. M., Dima, A. M., & Hadad, S. (2017). Excellence model for sustainable convergence in the EU higher education. *Amfiteatru Economic*, *19*(Specialiss), 1107–1122.

Gratzer, G., Muhar, A., Winiwarter, V., Lindenthal, T., Radinger-Peer, V., & Melcher, A. (2019). The 2030 Agenda as a challenge to life sciences universities. *GAIA - Ecological Perspectives for Science and Society*, *28*(2), 100–105. https://doi.org/10.14512/gaia.28.2.7

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate Data Analysis* (Seventh Ed). Pearson Education.

Hassan, S.-U., Haddawy, P., & Zhu, J. (2014). A bibliometric study of the world's research activity in sustainable development and its sub-areas using scientific literature. *Scientometrics*, *99*(2), 549–579. https://doi.org/10.1007/s11192-013-1193-3

Körfgen, A, Glatz, I., Maier, S., Scherz, M., Kreiner, H., Passer, A., Allerberger, F., Kromp-Kolb, H., & Stötter, J. (2019). Austrian Universities and the Sustainable Development Goals. *{IOP} Conference Series: Earth and Environmental Science*, *323*, 12156. https://doi.org/10.1088/1755-1315/323/1/012156

Körfgen, Annemarie, Förster, K., Glatz, I., Maier, S., Becsi, B., Meyer, A., Kromp-Kolb, H., & Stötter, J. (2018). It's a Hit! Mapping Austrian Research Contributions to the Sustainable Development Goals. *Sustainability*, *10*(9), 3295. https://doi.org/10.3390/su10093295

Larrán, M., Herrera, J., & Andrades, F. J. (2016). Measuring the linkage between strategies on sustainability and institutional forces: an empirical study of Spanish universities. *Journal of Environmental Planning and Management*, *59*(6), 967–992. https://doi.org/10.1080/09640568.2015.1050485

Leal Filho, W. (2011). About the Role of Universities and Their Contribution to Sustainable Development. *Higher Education Policy*, *24*(4), 427–438. https://doi.org/10.1057/hep.2011.16

Leal Filho, W., Shiel, C., Paço, A., Mifsud, M., Ávila, L. V., Brandli, L. L., Molthan-Hill, P., Pace, P., Azeiteiro, U. M., Vargas, V. R., & Caeiro, S. (2019). Sustainable Development Goals and sustainability teaching at universities: Falling behind or getting ahead of the pack? *Journal of Cleaner Production*. https://doi.org/10.1016/j.jclepro.2019.05.309

Leal Filho, W., Skanavis, C., Kounani, A., Brandli, L. L., Shiel, C., Paço, A. do, Pace, P., Mifsud, M., Beynaghi, A., Price, E., Salvia, A. L., Will, M., & Shula, K. (2019). The role of planning in implementing sustainable development in a higher education context. *Journal of Cleaner Production*, *235*, 678–687. https://doi.org/10.1016/j.jclepro.2019.06.322

Lozano, R., Lukman, R., Lozano, F. J., Huisingh, D., & Lambrechts, W. (2013). Declarations for sustainability in higher education: becoming better leaders, through addressing the university system. *Journal of Cleaner Production*, *48*(December), 10–19. https://doi.org/10.1016/j.jclepro.2011.10.006

Mawonde, A., & Togo, M. (2019). Implementation of SDGs at the University of South Africa. *International Journal of Sustainability in Higher Education*, *20*(5), 932–950. https://doi.org/10.1108/IJSHE-04-2019-0156

Mori Junior, R., Fien, J., & Horne, R. (2019). Implementing the UN SDGs in Universities: Challenges, Opportunities, and Lessons Learned. *Sustainability: The Journal of Record*, *12*(2), 129–133. https://doi.org/10.1089/sus.2019.0004

Ndubuka, N. N., & Rey-Marmonier, E. (2019). Capability approach for realising the Sustainable Development Goals through Responsible Management Education: The case of UK business school academics. *The International Journal of Management Education*, *17*(3), 100319. https://doi.org/10.1016/j.ijme.2019.100319

Paletta, A., & Bonoli, A. (2019). Governing the university in the perspective of the United Nations 2030 Agenda. *International Journal of Sustainability in Higher Education*, *20*(3), 500–514. https://doi.org/10.1108/IJSHE-02-2019-0083

Poon, J. (2017). Engaging sustainability good practice within the curriculum design and property portfolio in the Australian higher education sector. *International Journal of Sustainability in Higher Education*, *18*(1), 146–162. https://doi.org/10.1108/IJSHE-09-2015-0149

Pucci, T., Casprini, E., Galati, A., & Zanni, L. (2018). The virtuous cycle of stakeholder engagement in developing a sustainability culture: Salcheto winery. *Journal of Business Research*. https://doi.org/10.1016/j.jbusres.2018.11.009

Purcell, W. M., Henriksen, H., & Spengler, J. D. (2019). Universities as the engine of transformational sustainability toward delivering the sustainable development goals. *International Journal of Sustainability in Higher Education*, *20*(8), 1343–1357. https://doi.org/10.1108/IJSHE-02-2019-0103

Ramísio, P. J., Pinto, L. M. C., Gouveia, N., Costa, H., & Arezes, D. (2019). Sustainability Strategy in Higher Education Institutions: Lessons learned from a nine-year case study. *Journal of Cleaner Production*, *222*, 300–309. https://doi.org/10.1016/j.jclepro.2019.02.257

Rebelatto, B. G., Lange Salvia, A., Reginatto, G., Daneli, R. C., & Brandli, L. L. (2019). Energy efficiency actions at a Brazilian university and their contribution to sustainable development Goal 7. *International Journal of Sustainability in Higher Education*, *20*(5), 842–855. https://doi.org/10.1108/IJSHE-01-2019-0023

Sachs, J. D. (2012). From Millennium Development Goals to Sustainable Development Goals. *The Lancet*, *379*(9832), 2206–2211. https://doi.org/10.1016/S0140-6736(12)60685-0

Shawe, R., Horan, W., Moles, R., O'Regan, B., & O'Regan, B. (2019). Mapping of sustainability policies and initiatives in higher education institutes. *Environmental Science and Policy*, *99*(June), 80–88. https://doi.org/10.1016/j.envsci.2019.04.015

Stafford-Smith, M., Griggs, D., Gaffney, O., Ullah, F., Reyers, B., Kanie, N., Stigson, B., Shrivastava, P., Leach, M., & O'Connell, D. (2017). Integration: the key to implementing the Sustainable Development Goals. *Sustainability Science*, *12*(6), 911–919. https://doi.org/10.1007/s11625-016-0383-3

Stephenson, J. (2018). Sustainability cultures and energy research: An actor-centred interpretation of cultural theory. *Energy Research & Social Science*, *44*, 242–249. https://doi.org/10.1016/j.erss.2018.05.034

Suriyankietkaew, S., & Petison, P. (2019). A Retrospective and Foresight: Bibliometric Review

of International Research on Strategic Management for Sustainability, 1991–2019. *Sustainability*, *12*(1), 91. https://doi.org/10.3390/su12010091

The Global Alliance. (2019). *Annual SDG Accord Report 2019 Progress towards the Global Goals in the University and College sector*. https://www.sustainabilityexchange.ac.uk/files/2019_the_sdg_accord_un_high_political_forum_final_online_version.pdf

United Nations. (2015). *Transforming Our World: The 2030 Agenda For Sustainable Development*.

Utama, Y. J., Ambariyanto, A., Zainuri, M., Darsono, D., Setyono, B., Widowati, & Putro, S. P. (2018). Sustainable development goals as the basis of university management towards global competitiveness. *Journal of Physics: Conference Series*, *1025*, 12094. https://doi.org/10.1088/1742-6596/1025/1/012094

Yuan, X., & Zuo, J. (2013). A critical assessment of the Higher Education for Sustainable Development from students' perspectives - A Chinese study. *Journal of Cleaner Production*, *48*, 108–115. https://doi.org/10.1016/j.jclepro.2012.10.041

Zamora-Polo, F., Sánchez-Martín, J., Corrales-Serrano, M., & Espejo-Antúnez, L. (2019). What Do University Students Know about Sustainable Development Goals? A Realistic Approach to the Reception of this UN Program Amongst the Youth Population. *Sustainability*, *11*(13), 3533. https://doi.org/10.3390/su11133533

Zorio-Grima, A. (2020). Driving factors for having visibility of sustainability contents in university degree titles. *Journal of Cleaner Production*, *242*. https://doi.org/10.1016/j.jclepro.2018.10.344

Figure 1 - Geographic distribution of respondents

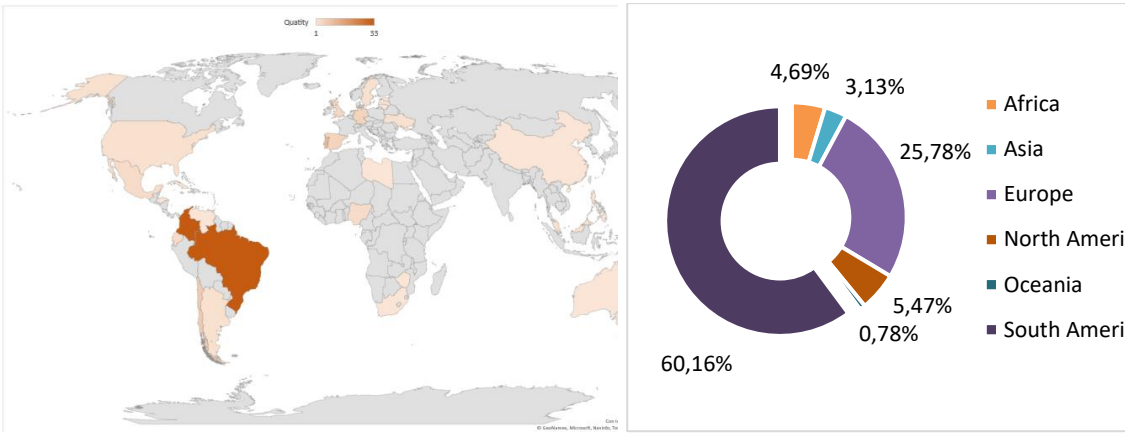


Figure 2 - Characterization of respondents (gender, academic position and type of institution)

(a) **(b)** **(c)**

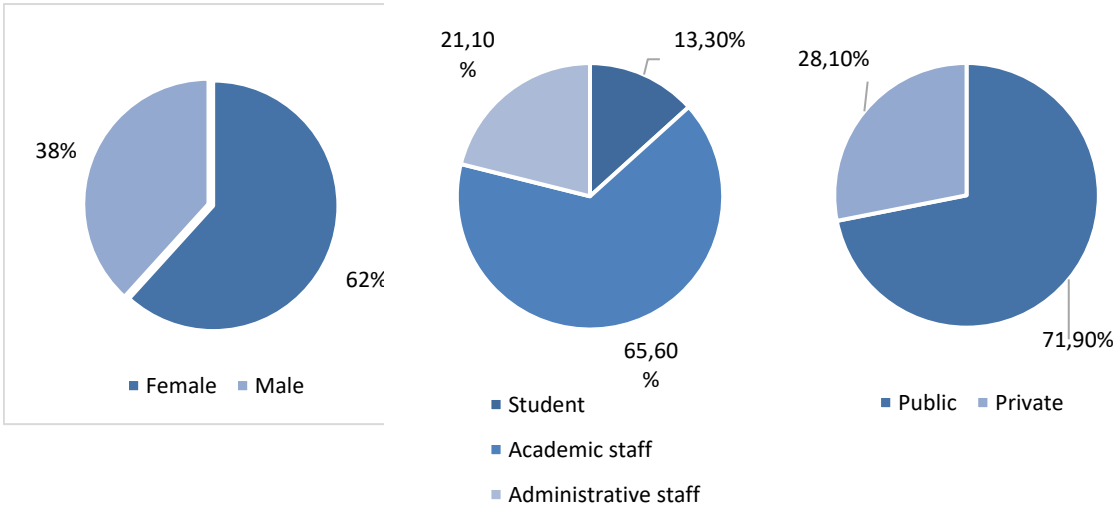


Figure 3. Scope of integration – strategy and operations

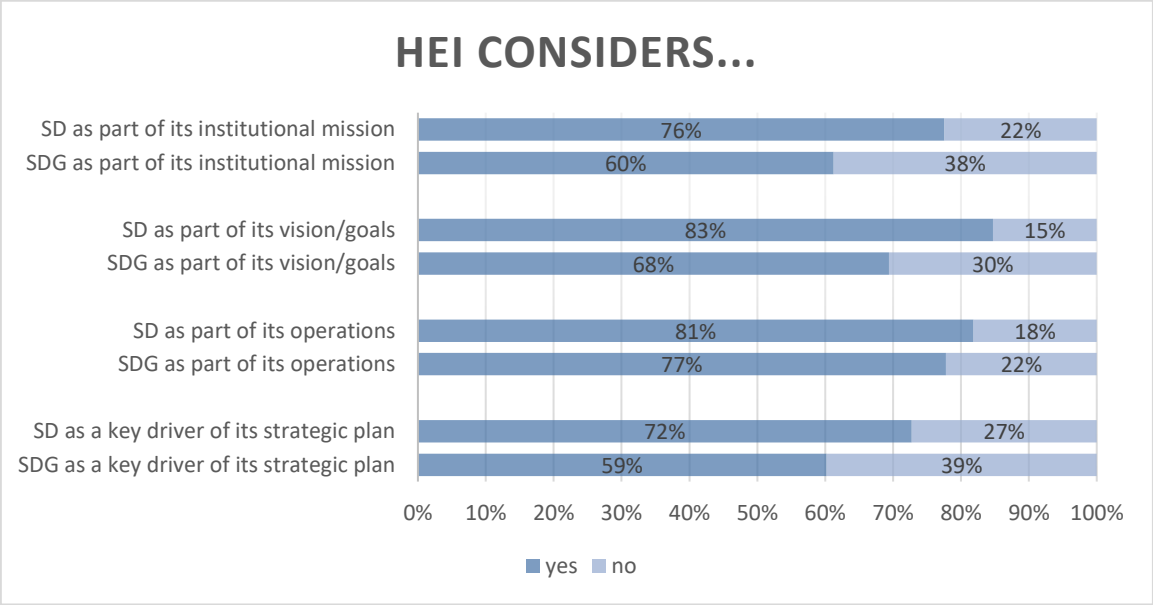


Figure 4. Scope of integration – policies and initiatives, and disclosure

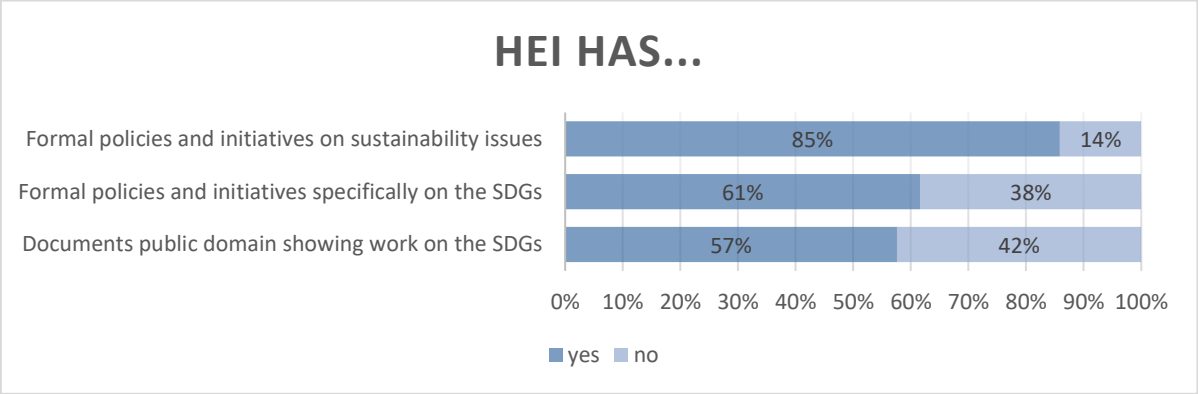


Figure 5 - Scope of integration – training

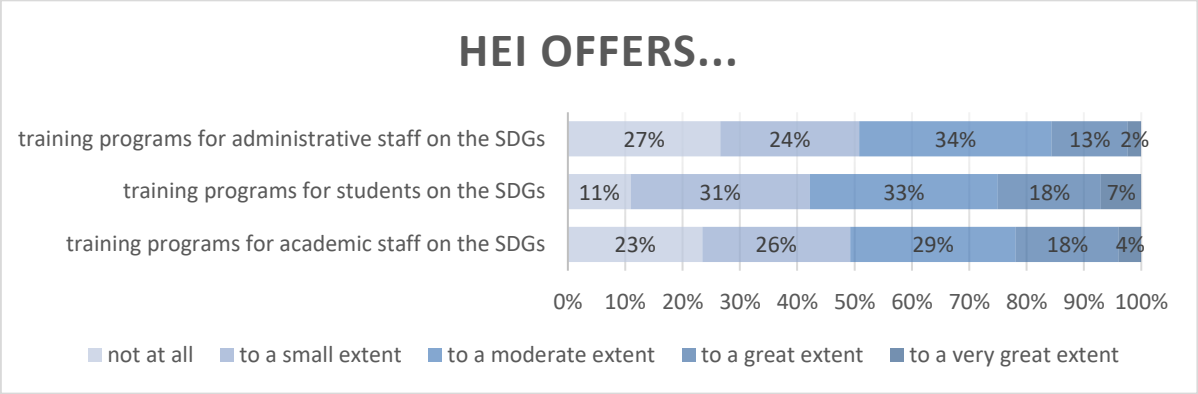


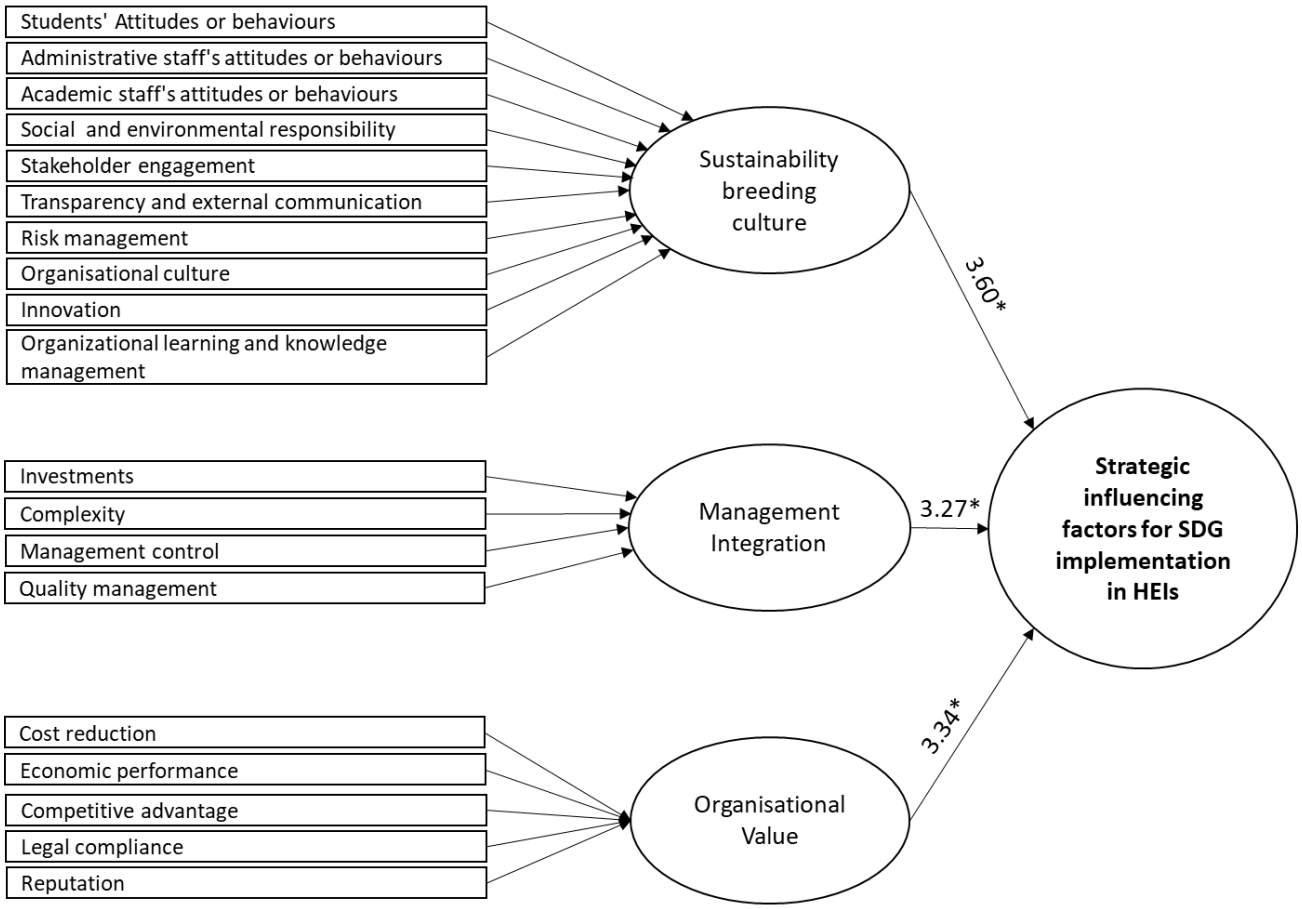
Table 1 - Results of Principal Component Analysis and Reliability Analysis

Rotated Component Matrix					
Items	Component loads[a]				
	SBC[b]	MI[c]	OV[d]	Mean	SD[e]
The possibility to foster existing attitudes or behaviors of students towards sustainability	**.891**	.267	.160	3.77	1.17
The possibility to foster existing attitudes or behaviors of administrative staff towards sustainability	**.833**	.344	.200	3.54	1.15
The possibility to foster existing attitudes or behaviors of academic staff towards sustainability	**.821**	.348	.193	3.59	1.17
The internal commitment to a social and environmental responsibility	**.806**	.162	.335	3.76	1.12
The possibility to foster existing level of stakeholder engagement	**.715**	.350	.348	3.50	1.09
The possibility to foster existing level of transparency and external communication	**.708**	.381	.348	3.44	1.14
The possibility to foster sustainability risk management	**.695**	.377	.324	3.38	1.15
The possibility to foster the existing organisational culture	**.648**	.589	.115	3.52	1.17
The possibility to foster sustainable development innovation	**.600**	.353	.398	3.68	1.08
The possibility to foster existing level of organisational learning and knowledge management	**.590**	.572	.316	3.34	1.19
Level of investment required for the integration process	.241	**.806**	.261	3.10	1.17

Level of complexity in the integration process	.473	**.753**	.167	3.17	1.14
The possibility to improve existing management control systems and tools	.456	**.668**	.396	3.34	1.20
The promotion of quality management	.426	**.662**	.349	3.48	1.18
The possible cost reduction	.193	.296	**.849**		
The expected economic performance	.141	.344	**.826**	3.24	1.20
The competitive advantage in relation to other HEI	.289	.189	**.706**	3.13	1.15
The existence of laws, regulations and legal compliance	.232	.037	**.703**	3.28	1.16
The potential impact of corporate reputation	.426	.494	**.523**	3.32	1.25
Component mean	**3.6**	**3.27**	**3.34**		
Reliability (Cronbach's Alpha)	**.963**	**.909**	**.877**		
Eigenvalue (rotated solution, varimax)	**6.48**	**4.13**	**3.88**		
Variance explained %	**34.13**	**21.76**	**20.42**		

[a]: component load >0.6 and in bold; SBC[b]: Sustainability Breeding Culture; MI[c]: Management Integration; OV[d]: Organisational Value; SD[e]: Standard Deviation.

Figure 6. Model for SDG integration into HEIs' strategic management



Note: *component mean

Figure 7 - Sustainability breeding culture component percentage

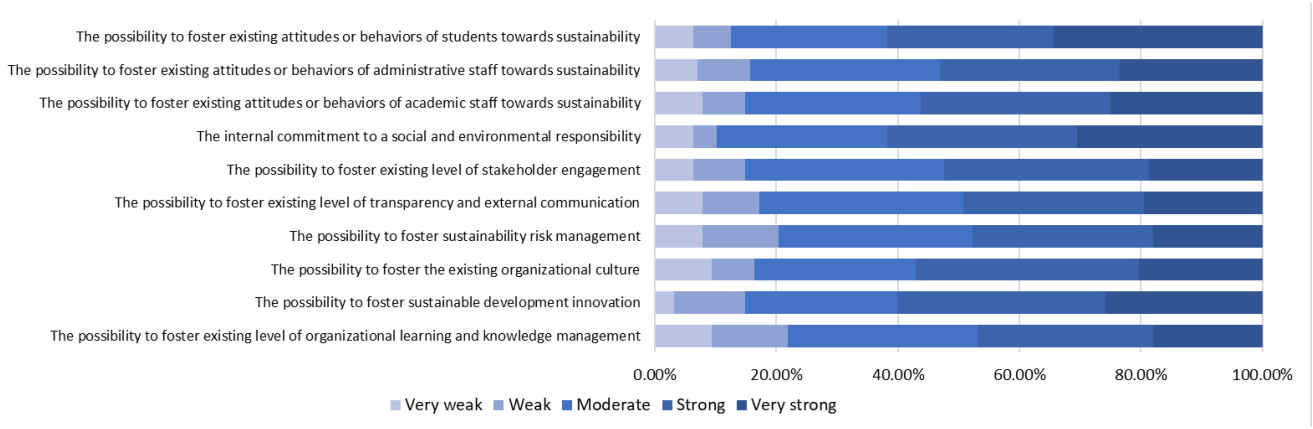


Figure 8 - Management integration component frequencies

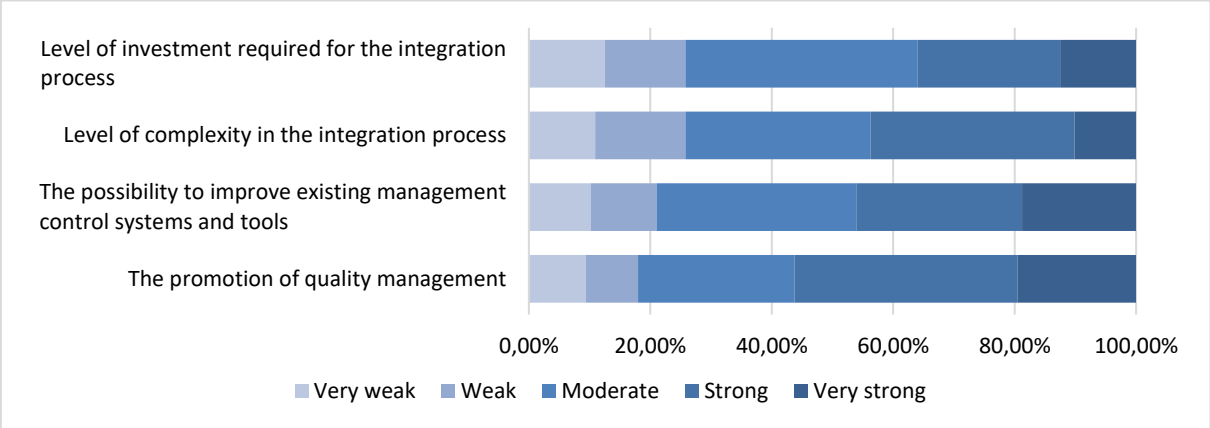


Figure 9. Organisational Value component frequencies

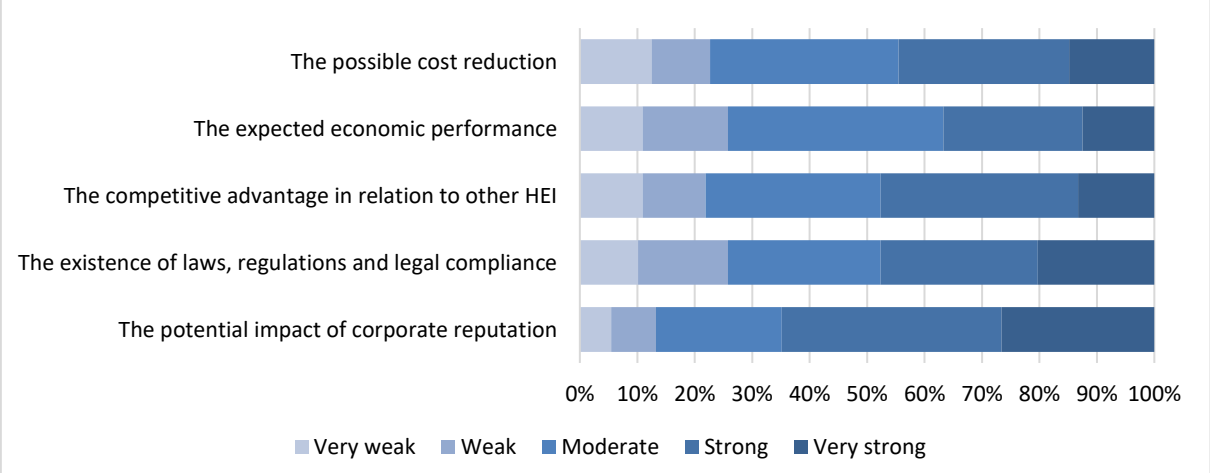


Figure 10 - Fostering the implementation of the SDGs in HEIs