How Does Sustainability Affect Governance in Universities?
A Systematic Literature Analysis

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Higher education, sustainability, and governance are concepts that share inherent complexity. Consequently, their integration is also intricate, requiring a holistic, systematic, long-term perspective, and it can yield positive effects only when supported by adequate planning, motivated personnel, efficient mechanisms for sharing integration principles, and an organizational culture conducive to transformation. This study used a systematic literature analysis technique and examined 102 articles to explore how sustainability impacts university governance, providing an extensive synthesis of the present understanding of this field. Specifically, this study presents a systematic categorization of previous research, identifies the significant areas that have not been well addressed, highlights potential research directions, and makes suggestions to expand the scope of future research. Furthermore, the results from cluster analysis indicate that universities are undertaking new and intriguing initiatives in the context of Sustainable Development Goals. This demonstrates that sustainability has influenced governance by stimulating university collaborative projects. Overall, there appears to be consensus on the need for a systematic and engaging approach to integrating sustainability into the governance of university institutions. This research provides university administrations with valuable information for making sustainable decisions. Likewise, this study draws researchers' attention to the existing research gap and investigates the findings of earlier studies.

Keywords: higher education, sustainability, governance, cluster analysis, systematic literature review

Introduction

The scholarly focus on sustainability and its impact on the higher education sector has steadily increased in recent decades. (Sacchi et al., 2023; Leal Filho et al., 2020; Moon et al., 2018). The concept of sustainable development has always been progressive and influential enough to bring about significant changes in universities. The application of sustainability principles goes beyond the core mission of academic institutions, seamlessly blending their conventional roles as knowledge creators and disseminators with the concept that universities should proactively serve as catalysts for sustainable transformation. Educational institutions fulfill their traditional tasks of generating and sharing information and actively participate as accelerators for sustainable change by implementing sustainability principles. (Bauer et al., 2020).

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Integrating sustainable development concepts into higher education can be traced back to the 1960s to 1970s when green universities were part of the environmental education movement (Corcoran et al., 2004). However, it was only through the Decade of Education for Sustainable Development and the 2012 Rio Summit that tangible evidence of a direct commitment to addressing this matter emerged (Filho et al., 2020). Furthermore, with the United Nations' Agenda 2030, Sustainable Development Goal 4, Quality Education, was established. Target 4.7 focuses on students' need to acquire the skills necessary to integrate critical thinking within sustainable development concepts. This endeavor is realistic and formidable, given that higher education is a highly intricate system entrenched in established management, organization, and performance evaluation methods. Introducing sustainable development concepts into such an environment introduces complexity into the university's organizational framework. Systematic and progressive interventions are imperative, encompassing all the essential tools to ensure that these changes are embraced by staff and stakeholders as a positive transformative shift in the academic sphere. Consequently, the governance system is the only way to effectively incorporate sustainability, a multidimensional structure that, through formal rules, engages "decision-makers, stakeholders, processes, and hybrid practices" to collectively "realize a common goal" (Sacchi et al., 2023).

Governance serves as a mechanism that ensures transparency in performance, strategies, and behaviors concerning the sustainability of universities. Moreover, it legitimizes and fosters dialogue among stakeholders, reshapes organizational culture, transforms organizational norms and values, and integrates these effects within the contextual framework (Roos et al., 2023). In these terms, governance takes on holistic attributes, mirroring the principles of sustainable development, thereby promoting and supporting the integration of sustainability concepts within universities. The institutions of these mechanisms pose a challenge, as it necessitates effecting change rather than mere adaptation (Bauer et al., 2020).

What further compounds the challenge is the prevailing consensus within the literature that governance for sustainable development in higher education must inherently involve the entire institution. The approach should be multidimensional and inclusive of multiple stakeholders, with the institution clearly understanding the purpose of sustainable development and responsibly allocating tasks and responsibilities, shifting away from the conventional top-down approach. This approach should be anchored in the interdisciplinary nature of task forces, open professional dialogues, and integrated issue management (Bauer et al., 2021). All these factors present several implementation challenges, not least of which is the complexity introduced by involving many researchers, professors, and university staff members, which can complicate organizational processes, heighten dialogues among participants, and bring differences of opinion to the forefront.

The intertwining of governance and sustainability within the context of higher education is expected, at least in theory, to fulfill several functions on which scholars have a consensus. Firstly, it should achieve strategic alignment by connecting sustainability principles with the university's mission and vision, providing a broad framework to base strategic planning and the decision-making process (Goni et al., 2017). Secondly, it should ensure accountability and transparency: clear delineation of roles and mechanisms for reporting on the performance of sustainability initiatives enables more effective monitoring by stakeholders and greater precision in setting and attaining objectives (Leal Filho et al., 2021).

Thirdly, governance should enhance the development and implementation of the university's sustainability policies. Through this facet, disseminating sustainable development logic should be swifter and more efficient, improving campus operations and community engagement (Mader et al., 2013). Fourthly, it should enhance resource allocation for sustainability-related projects. Thanks to the oversight provided by a robust governance

system, it is possible to ensure that sustainability projects receive adequate support and funding (Brown, 2010).

Fifthly, governance facilitates greater stakeholder involvement, enhancing collaboration among the actors involved in sustainable development and encouraging the sharing of decisions and results (Niedlich et al., 2019). Furthermore, governance allows for monitoring and evaluation of performance in sustainability projects. Metrics and key performance indicators are employed to identify strengths and areas for improvement, thereby contributing to the efficiency of sustainability efforts (Mader et al., 2013). Moreover, it enables a more seamless integration of sustainability concepts into study curricula, fosters research and innovation, and promotes collaboration between the university and private enterprises. Therefore, from a long-term perspective, governance should enhance community involvement, expand the reach of stakeholders, and foster innovative solutions for sustainable development (Cassar, 2022).

Within this context, it becomes evident how the intricate systems of higher education, sustainable development, and governance intertwine. The central challenge lies in comprehending the benefits and drawbacks arising from these interconnections and considering that sustainability governance and performance management approaches diverge across different universities (Roos et al., 2023). With no universally accepted standard in place, insights into these advantages and disadvantages can only emerge through exploring the reciprocal influences these systems exert on each other. Exploring how sustainable development shapes academic institutions' governance is particularly significant, a pivotal issue within scholarly inquiry.

However, obtaining a structured assessment of the available literature, identifying the gaps between existing literature and what still needs to be learned, and determining future research directions can present multiple challenges. Furthermore, an inadequate understanding of a situation may lead to an inaccurate assessment of the policy-level implications for sustainable governance in universities. Previous studies have not made a significant effort to comprehensively gather these scattered observations to guide future research on sustainable governance in universities. Inspired by the lack of organized investigations, research questions (RQ) are:

RQ1: How has sustainability been integrated into the governance of university institutions?

RQ2: What is the current research profile for sustainability applications in university governance?

RQ3: What are the emerging constraints and challenges the literature suggests for this research field?

RQ4: How can this research profile and challenges be utilized to establish the future research direction?

To answer these questions, this study conducts a systematic literature review (SLR) of the current body of literature that examines sustainable governance in universities. An SLR, or Systematic Literature Review, is crucial in presenting a thorough overview of the existing information in a particular study field and identifying the areas where knowledge is lacking. It also helps determine future research directions that need to be pursued (Tandon et al., 2020). Although just a handful of research has examined the influence of governance on university sustainability and provided valuable insights, these investigations predominantly operate under the presumption that governance impacts sustainability. Mainly, these studies have neglected to explore hypothetical connections between universities, sustainability, and management, which has resulted in restricted opportunities for future research.

This study makes the following essential contributions. Firstly, it provides a systematic and comprehensive examination of literature, accompanied by an analysis of the current state of research, thematic categorizations, constraints, and prospective domains of investigation that should contribute to advancing this discipline. Furthermore, this investigation establishes the different research gaps and provides future research directions based on these gaps.

Literature Review

Global challenges, such as the United Nations Decade of Education for Sustainable Development and the Sustainable Development Goals, have influenced universities' progress in integrating sustainability (Mac-lean et al., 2020). Similarly, sustainability is also a challenge in the governance of higher education institutions, as it involves the structures and procedures for making decisions on issues impacting the university, community, and stakeholders (Fehrenbach & Huisman, 2024; Abubakar et al., 2020). According to Abubakar et al. (2020), it is believed that a critical aspect of effectively governing higher education institutions nowadays is to ensure sustainability by aligning their missions and activities with their specific sustainability objectives. At HEIs, sustainability and governance are interconnected; on the one hand, governance encourages stakeholders to take sustainability initiatives. Conversely, sustainability can be integrated into university functioning only if governance processes are solid and effective enough to transform universities (Krizek et al., 2012; Disterheft et al., 2015). Functional leadership with sufficient authority to carry out its responsibilities and ensure effective governance systems in higher education institutions are needed to achieve sustainable development goals (Abubakar et al., 2020). Governance is critical to campus sustainability through research, operations, and pedagogy.

Governance is an essential factor for sustainability that promotes the university's environmental, social, and economic resilience (Leal Filho et al., 2022a, 2022b; Yusoff et al., 2021). Furthermore, strategic planning, efficient communication, and feedback channels are all essential for effective governance in directing campus sustainability (Abdullah et al., 2017). However, engagement in sustainability is voluntary for institutions, and several studies have found that resistance is a barrier. Complex governance, bureaucracies, limited skills, and multitasking responsibilities of sustainability leaders result in rigid university structures (Blanco-Portela et al., 2018). These difficulties include the voluntary nature of involvement, the inflexible organizational structure of universities, the growth of these initiatives, and a stronger focus on sustainability at HEIs (Bautista-Puig, 2021).

The field of administration and management is the biggest obstacle to the sustainable development of universities; for example, they do not have the power to require teachers to include sustainability in their curriculum. These obstacles result in a lack of governance structure for SD. (Leal Filho et al., 2017). Another discussion focused primarily on environmental programs, particularly regarding two themes: first, energy consumption and waste reduction and integration into normal university operations, and second, greening of the curriculum (Bautista-Puig, 2021). Internal social and governance restrictions within HEIs significantly impact the implementation of sustainable initiatives (Amaral et al., 2020). The reason why universities cannot fully implement sustainable development is precisely because sustainable development is not just a theory but a call to action and an ongoing effort. In this respect, the Sustainable Development Goals (SDGs) are an opportunity for these institutions.

Methodology

Systematic Literature Review

This study addresses the question of how sustainability affects higher education governance. To answer this research question, a systematic review of the literature was done to fill the gap in literature because SLRs can provide a higher level of objectivity than other types of literature reviews (Pizzolitto, 2023). In particular, the protocol created by Wolfswinkel et al. (2013) was employed to perform the research. SLR is a formulated

question that uses systematic and explicit methods to identify, select, and critically appraise relevant research and collect and analyze data from the studies included in the review (Pizzolitto et al., 2022; Moher et al., 2009).
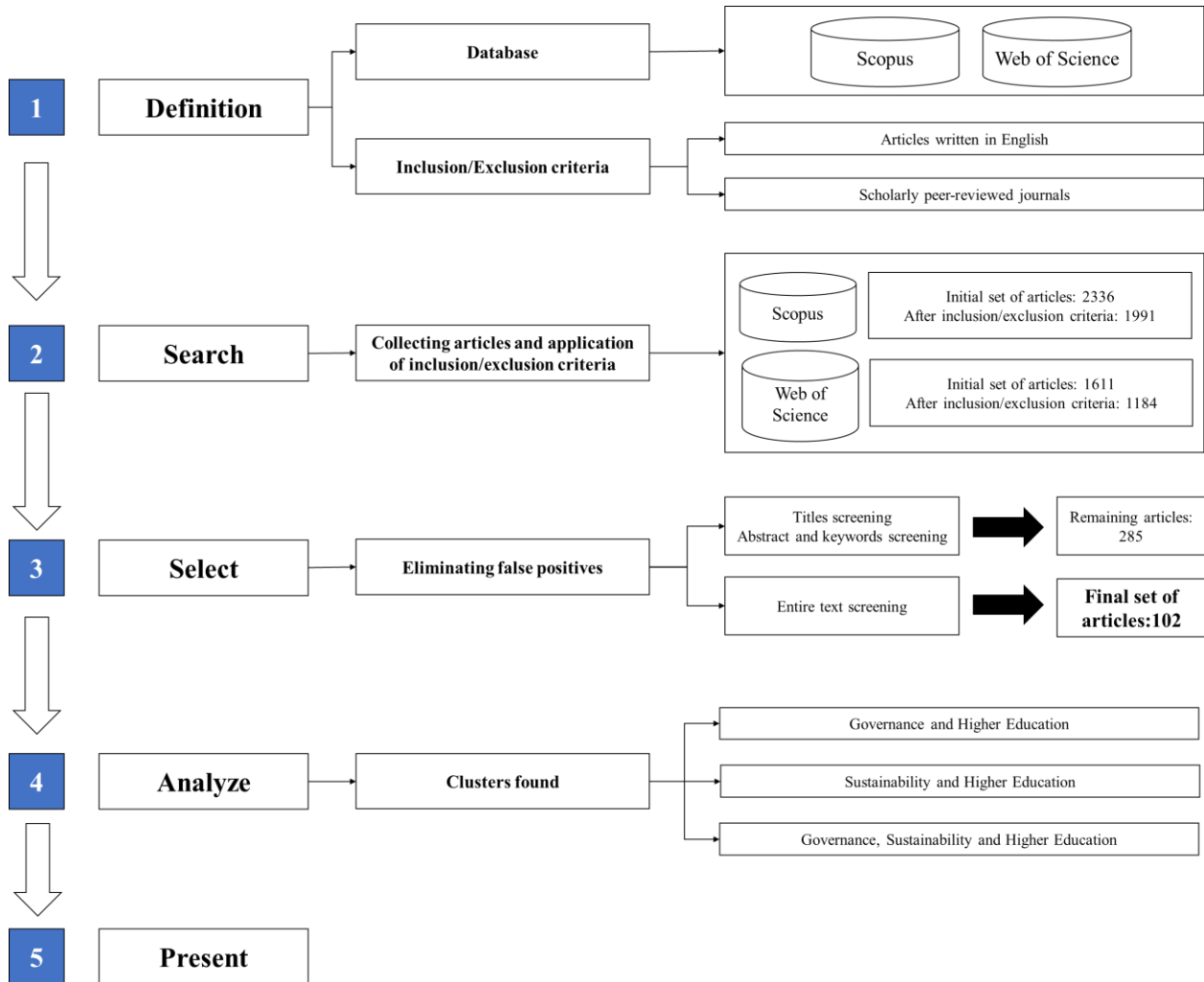

Figure 1. The employed protocol.

This study used the method described by Moher et al. (2009), PRISMA (preferred reporting items for systematic reviews and meta-analysis), to select and interpret the articles as shown in Figure 1. There are several advantages of using PRISMA. First, it allows us to construct a theoretical framework without any specific background (Corbin & Strauss, 1990). Second, there is no difference in item selection compared to other SLR systems (Post et al., 2020). However, PRISMA is the perfect choice for developing content analysis due to these advantages.

The Employed Protocol

This method includes five phases: definition, search, selection, analysis, and presentation. The database and the study's inclusion/exclusion standards were decided upon during the first phase (Pizzolitto, 2023). The sample only consisted of English-language publications published in scholarly journals and conference proceedings after being peer-reviewed. Only those articles featured in the SCOPUS and Web of Science databases were considered to guarantee that only the best publications would be included. Finally, keywords were given to the article titles,

abstracts, and keywords to search the two databases (Salam et al., 2019). The keywords were sustainab* AND govern* AND higher AND (education OR university).

The second stage involved the search for articles. Numerous exploratory analyses were conducted initially to ensure that all pertinent literature would be included. SCOPUS was used to start the investigation, and 2336 results were found. The list was reduced to 1991 results when the search was restricted to peer-reviewed English-language literature, leaving 1991 findings, as the emphasis was on research about sustainability and governance in higher education. The same protocol was applied on the Web of Science, and initially, 1611 results were found; the list was reduced to 1184 when the search was restricted to peer-reviewed, English-language literature, leaving 1184 findings related to sustainability and governance in higher education.

The 3175 findings from both sources were refined in the third phase, and 3073 false positives were removed when titles, abstracts, keywords, and contents were scrutinized. The 102 articles that comprised the dataset were from SCOPUS and Web of Science. The procedure's final two steps were "analyzed" and "present". The articles' descriptive and content analyses, or the outcomes of these stages, are presented in the next section. The types of papers, the distribution of publications across time, the productivity and connections of the authors, and the methodologies used in the empirical studies were all examined when analyzing the articles.

Inclusion and Exclusion Criteria

By following Moher et al. (2009), this study created a detailed selection procedure that included the following steps: first, we reviewed the titles of all retrieved research articles; second, we evaluated the abstracts and keywords of initially chosen articles; and third, we assessed the entire full text of all articles for compliance with research objectives before making a final inclusion decision. From the databases, 3175 articles were initially found. After limiting the search to peer-reviewed English articles, 3073 unique articles were kept. After screening the titles and abstracts, 285 articles were kept for full-text review, but only 102 met all three inclusion criteria. An overview of the search strategy for a systematic literature review based on the PRISMA (preferred reporting items for systematic reviews and meta-analysis) criteria published by Moher et al. (2009) is adopted.

Results and Discussion

One hundred and two articles were analyzed to assess the effects of sustainability on governance in universities and establish the direction of future research in this field. However, the following results were obtained from a systematic literature review analysis.

Cluster Analysis

Clustering is an analytical technique used in Systematic Literature Reviews (SLRs) to arrange related research, content, or themes in one group. This improves the synthesis, analysis, and management of enormous amounts of data. However, this study finds three clusters from a systematic literature review analysis. The first cluster consists of governance and higher education integration. The second cluster explains the sustainability of higher education institutions. The third cluster connects sustainability and governance with HEIs. Each cluster has a comprehensive analysis presented in the following subsection.

Governance and HEIs

Governance discourse is essential to achieving a stable and productive level where people can have more opportunities and grow. Governance determines who is in charge, who makes choices, how other stakeholders can be heard, and who is responsible. However, governance is exercising economic, political, and administrative

power to oversee all aspects of a nation's affairs. It consists of institutions, processes, and mechanisms that allow people to express their needs, assert their legal rights, fulfill their obligations, and resolve conflicts (Guha, 2019).

According to research, excellent governance can ensure that an organization performs better. Learning quality in higher education is correlated with academic delivery performance (Mutsotso & Abegna, 2010). The success of the learning strategies is also influenced by the pupils' socioeconomic status, motivation, and study techniques. Quality learning is also dependent on the methods of instruction used. A tailored approach may be more helpful for students' performance because the same study strategy may not work for everyone (Dayanandan, 2013). The concept of university governance is extensively debated in political and economic contexts. However, it is still essential to balance available resources and potential (Zaman, 2015). Furthermore, it plays a critical role in the administration and teaching sides of the university (Huang, 2018). Because of this, academic governance is compulsory in universities, which leads the university to financial success, educational standards, and quality (Indiran, 2022). However, the evolution of academic responsibilities and networks over the past ten years has made university governance necessary.

It highlights the requirement for a dynamic organizational structure that permits flexibility and agility to adjust to global changes and advancements. According to specific literature, "academic governance" refers to a broad process and method in universities with goals of financial success, social responsibility, academic standards, quality, and political diplomacy (Indiran, 2022).

In addition, good governance favors educational achievements and contributes to developing various educational policies (Guha, 2019). It is possible to improve educational efficiency by implementing measures such as good accountability, political stability, the efficacy of the government, the quality of regulatory oversight, the rule of law, and the control of corruption (Singh et al., 2008). Regarding the concept of excellence in higher education, a report has concentrated on the areas of excellence in management practices, teaching, research, and student performance (Bautista et al., 2021). Effective governance allows stakeholders of an education institute to share a common vision and purpose.

Monitoring and self-assessment will be a facet of governance practices to achieve quality in higher education institutions. Deploying quality functions is an essential strategy for dealing with tangible and intangible resources that will serve as a vehicle for academic reforms (Singh et al., 2008). Positive governance affects educational outcomes and aids in the creation of various educational policies. No good governance will negatively impact higher education institutions. An educational institution's stakeholders can share a shared vision and goals thanks to effective governance (Blanco-Portela et al., 2018). Ultimately, managerial practices, teaching, research, and student performance excellence have received most of the attention in the concept of excellence in higher education (Brusoni et al., 2014).

The discussion of the challenges that higher education faces, followed by governance in higher education, has been narrowed down by outlining a few elements (Zaman, 2015). These elements involve authority, accountability, transparency, trust, discipline, active decision-making, effective communication and information accessibility, the effective use of information technology in governance practices, compliance, satisfaction of stakeholders, and research activity as supportive elements for the training of governance in higher education institutes (Guha, 2019).

Sustainability and HEIs. All societal actors must take part in achieving sustainable development, and higher education institutions (HEIs) should actively and fundamentally support sustainability practices in this regard. The acknowledgment of the greening university in the environmental education movement of the 1960s

and 1970s is the foundation of the sustainability movement in higher education (Corcoran et al., 2004). This movement indicates all aspects, including administrative policies, academic standards, and facility management (Bautista et al., 2021). These organizations have worked very hard to incorporate sustainability into their operations. The conferences that have taken place and the agreements and declarations that have resulted from them, particularly those that have occurred since the 1990s, such as the Talloires Declaration from 1990 or the Halifax Declaration from 1991, as well as initiatives like partnerships or networks, such as the Higher Education Sustainability Initiative (HESI) from 2012, are undoubtedly responsible for this progress (Corcoran et al., 2004).

Nonetheless, it has been passionately contested that this signing pledge does not guarantee the integration of SD into their systems. However, A sustainable university is a higher education institution (HEI) that addresses, involves, and promotes sustainability on a regional or global level. It reduces the adverse effects of social, environmental, and economics using their resources to carry out its functions of teaching and research to support society's transition to sustainable lifestyles (Velazquez et al., 2006).

Although it is commonly recognized that sustainability research in higher education contributes significantly to demonstrating the academic brilliance of higher education institutions (HEIs) and their societal effects, prior research examines sustainability in higher education, including curriculum development, campus greening initiatives, research activities, and governance practices. According to Seatter and Ceulemans (2017), Every university engages in sustainability-related activity. Other studies have concentrated on the learning environment, the teachers' abilities, or environmental behaviors (Leal Filho et al., 2022a). However, numerous researchers examined the results of sustainability in higher education (Bautista et al., 2021; Disterheft et al., 2015; Krizek et al., 2012). According to Chambers and Walker (2016), the five areas of sustainability that can be addressed at HEIs are education, research, campus, operations, community outreach, and lastly, assessment and reporting; in this way, the framework for HEIs can incorporate sustainability in various dimensions.

Sustainability always positively correlates with HEIs, having two aspects. First is minimizing waste and energy use, integrating sustainability practices into regular university operations, and the other is greening the curriculum (Bautista et al., 2021). However, internal social and governance restrictions within HEIs significantly impact these institutions' implementation of sustainable projects (Amaral et al., 2020). Other authors emphasize problem-solving among all participants as the primary driver of collaboration as a tactic for sustainability and the importance of cooperation as a strategy for sustainability (Godemann et al., 2014). Universities cannot ultimately adopt SD because it is more than just a theory; it is a call to action and a work in progress. The Sustainable Development Goals (SDGs) present an opportunity for those institutions.

A broad range of publications on sustainability in higher education reflect scientific study's various forms and directions. Even though sustainability research has advanced significantly over the past ten years, snowballing, extending in terms of themes and geographic applications, and deepening in theories and methods, it still faces challenges in higher education. Accordingly, further actions are still required to reboot sustainability research and encourage creativity at HEIs.

Governance, sustainability, and HEIs. In both practice and research, sustainability in the governance of HEIs continues to receive more attention. Even though recent studies indicate that HEIs are undergoing a sustained transformation, including evidence of holistic and systemic methods (Hoover & Harder, 2015), they also state that efforts are frequently divided into several categories and that it is still challenging to integrate sustainable development goals practically (Lozano et al., 2015).

These findings bring up the topic of sustainability in the governance at HEIs. "The process of steering society

and the economy through collective action and by common goals" is one definition of governance (Niedlich et al., 2020). Based on this concept, this study defines "governance" as the process of guiding HEIs through collective action toward the shared objective of sustainable development. Numerous recent studies have investigated this process-related question. These studies can be divided into three categories: Case studies, examinations of factors that cause and hinder, and models and frameworks (Hoover & Harder, 2015); however, currently, the focus is only on content and thematic analysis.

Due to the urgent issues arising from the absence of sustainability and the societal obligation of higher education institutions, supporting sustainability might be viewed as a straightforward endeavor for a university (Hoover & Harder, 2015). Therefore, governance procedures and institutions can be considered "good" if they aim to promote a more sustainable society. From this perspective, sustainable governance can be viewed as an inherent aspect of a higher education institution's (HEI) responsibilities in teaching, research, and campus administration. When discussing incorporating the goal of "sustainability" into higher education institutions (HEIs), it is essential to examine various perspectives and the organizational structures and processes that drive sustainability initiatives (Leal Filho et al., 2022a). This distinction aligns with the differentiation of "good governance" that seeks to achieve positive normative goals through involvement, transparency, and analytical comprehension of government.

The literature on organizational change management frequently mentions organizational culture, empowerment and involvement, and internal communication (Verhulst & Lambrechts, 2015). Creating some sustainability office, a predictable budget, alignment with the subjects of the imparted careers, formal networks, and open and frequent communication on sustainability on campus and beyond is part of sustainability in HEIs (Machado and Davim, 2023; Machado and Davim, 2022; Dlouhá et al., 2018; Lozano,2006). However, some researchers have also mentioned that campus sustainability champions or "a dedicated team of sustainability entrepreneurs" (Niedlich et al., 2020; Hoover & Harder, 2015).

This study examines how sustainability can become permanently ingrained in the governance of HEI's agenda and go beyond discrete support points. The term "governance" in this context refers to actors within the HEI who must make formal and informal decisions regarding internal goals, structures, procedures, and measures as well as membership in external networks in the context of sustainability, not (primarily) to political institutions outside the HEI (Niedlich et al., 2020). Collectively binding decisions establish justification, direction, and success standards for sustainability-related actions in HEIs for good governance management.

It is evident that governance and sustainability, within the context of higher education, can have far-reaching impacts that can only be effectively addressed with adequate long-term planning, a workforce that shares these long-term objectives, suitable mechanisms for sharing information, and an organizational culture that facilitates diffusion, acceptance, and adoption (Abdullah et al., 2017). Unfortunately, literature has shown the existence of certain obstacles to this transformation, including the inflexible structure of universities, overburdened staff, and the challenge of instigating a general shift in institutional focus (Bautista-Puig, 2021).

In addition to these characteristics of sustainability in governance, there are numerous other critical aspects at universities, such as dependability and accountability, adequate funding, long-term planning, employee support, and senior management commitment (Leal Filho et al., 2020). Participation and conversation, the engagement of various stakeholders, and co-creative processes are also significant aspects of sustainability in governance at HEIs (Niedlich et al., 2020).

Several studies highlight the need for committed and motivated individuals referred to as "sustainability

champions" in the university's reform processes toward sustainability (Lozano, 2006). Despite the abundance of new material on mechanisms and traits that drive sustainability, there is a paucity of research on the overarching mechanisms for sustainability governance in universities (Hoover & Harder, 2015). The impact of organizational culture on sustainability governance (Robinson & Pedersen, 2021), the relationship to organizational learning and change theory, and the extent to which sustainability governance resilience can be exploited for university sustainability transformations (Niedlich et al., 2020; Hoover & Harder, 2015). However, sustainability plays a vital role in the governance of HEIs.

Systematic Categories

This study examined the contents of the selected papers to gain critical insights into the relationship between sustainability and university governance. Content analysis has been recognized as an excellent method for synthesizing qualitative information and identifying the approaches and classifications used in prior literature. The following categories are used within this topic.

Data analysis techniques categorizations. Data analysis techniques involve transforming raw data into usable information using statistical or logical procedures. This information is then used to facilitate decision-making. It encourages researchers to gather data unbiasedly, presenting the results of different variables and allowing them to evaluate the effects of various prospective scenarios (Prajapati et al., 2019).

In prior literature, different data analysis techniques include factor analysis, cluster analysis, structural equation modeling, difference-in-differences estimations, thematic and content F analysis, correlation analysis, factor and panel regression analysis, and parametric tests like t-tests. The technique that was used the most was fundamental linear regression analysis. Data is collected and analyzed to investigate research questions, validate hypotheses, or refute theories. Table 1 demonstrates the distribution of research articles on sustainable university governance using various data analysis approaches.

Research methods categorization. Statistics indicate that in the past, sustainable governance researchers have utilized 5 study methodologies, categorized as individual and hybrid (Table 1). It has been observed that the conceptual and theoretical models (50 publications) are the research methodology most employed in universities for sustainable governance. Subsequently, there are 10 case studies, 2 case studies with interviews, three survey pieces, and 16 articles on secondary statistical data analysis or mixed with qualitative and quantitative analysis.

Table 1

Categorization of Literature

Approaches' Categories	Analysis Techniques	Description
	Qualitative	SLR, Theoretical, Conceptual
Research Design	Quantitative	Secondary data, Statistical Model, and Survey bases
	Mixed	Qualitative + Quantitative based
Data Analysis Techniques	Content Analysis	Summarization of available data in both qualitative and quantitative
	Statistical Analysis	
	Conceptual Model SLR	Theoretical Aspects and Systematic Literature Review
	Secondary Data	Collection of data from different secondary sources
Research Methods	Case Studies	Thorough study of a subject and the context surrounding it
	Survey	Questionnaire-based survey
	Interview	Presence and online interview
Research Areas	Governance in HEI	Transformation of former governance into sustainable governance
	Environmental, Social, Economic, and Sustainability in HEI	Green Campus, Green Curriculum, and Accountability

Research Gaps

Data-Related Gaps

The primary data-related concern from prior literature is the generalizability of the study findings, which was frequent observation. The case-based study in the review was limited to a particular country or a few locations, hindering the findings' analytical generalizability (Sacchi et al., 2023; Abubakar et al., 2020). Furthermore, most of the qualitative research included in this review was conducted as single case studies and was limited to a single nation. This limitation is likely to impede the applicability of the findings across other contexts (Cassar, 2022). In addition, this analysis identified the issue of statistical generalizability in multiple primary survey-based quantitative research, where it was difficult to conclude the data that could be applied to a larger population (Lozano et al., 2015).

The second concern is using qualitative research methodologies in certain studies investigating the correlation between university governance and sustainability (Leal Filho et al., 2023; Niedlich et al., 2020). Inherent difficulties of the qualitative research design include restricted sample size, ethical concerns, contextual factors, and the analysis of non-numerical data. Although these are typical constraints of qualitative research, they tend to impact the results and create uncertainty on the study's rigor if the selected research design is not suitable and justifiable (Sacchi et al., 2023; Abdullah et al., 2017).

Analysis Related Gaps

Lack of studies on the impact of sustainability on governance in HEIs. The existing body of research on the relationship between universities, governance, and sustainability has been primarily unidirectional (Sacchi et al., 2023; Amaral et al., 2020), as evidenced by the extensive number of studies that have examined the impact of governance on university sustainability (e.g., sustainable infrastructure, sustainable teaching, and sustainable curriculum). Sustainability also affects governance. However, research on the effect of sustainability on university governance was constrained (Bauere et al., 2018). While the insights offered by studies in the prior literature were valuable, researchers must recognize that neglecting other potential relationships could result in significant policy implications.

Lack of studies on moderating effects. Most prior studies did not extensively investigate moderating factors that impact the relationship between sustainability and university governance (Sacchi et al., 2023; Abubakar et al., 2020). For instance, the research indicated that increased transparency, accountability, resource efficiency, and resilience would contribute to better university governance (Abdullah et al., 2017). However, these mechanisms have not been validated empirically. This concern dominated quantitative research that utilized secondary data sources. Consequently, the previous research investigations could not determine the precise mechanisms through which sustainability could impact university governance; thus, a more profound comprehension of different mediating factors is required. In the same way, the analysis identified several moderate factors, such as social equity, economic sustainability, technological innovation, and integrational equity. However, the previous study offered a restricted comprehension of the factors that can impact and modify the relationship between sustainability and university governance. Further, the moderating aspects should be investigated to enhance understanding of the relationship between sustainability and university governance.

Lack of studies on quantitative analysis. Most studies on sustainability, governance, and universities are qualitative (Goni et al., 2017; Lozano et al., 2015). However, the research is restricted to quantitative analysis. In sustainable governance university research, methodologies such as secondary data analysis, survey data

analysis, and parametric analysis are not included. Several significant limitations and research gaps must be effectively addressed to advance this field. Future research areas are highlighted in the sections that follow.

Future Research Directions

Based on the identified gaps, future studies into sustainability, governance, and universities can be conducted in the following areas, but they are not limited to them.

Extending the Data Collection and Analysis

Most prior research on sustainability in university governance has been mainly qualitative and biased toward quantitative methods (Cassar, 2022; Bautista-Puig, 2021). Future research should use quantitative research methods in studies examining the sustainability of university governance, including observations, questionnaires, interviews, online surveys, web-based surveys, and email-based surveys. However, Survey research is crucial to sustainability in university governance because it enables the effective collection of vast quantities of data and the acquisition of feedback. The primary objective of these methodologies is to authenticate the dependability and validity of the developed theory. It is also necessary to utilize advanced data analysis techniques such as chi-square analysis, cost-benefit analysis, network analysis, correlation analysis, regression analysis, input-output analysis, and cluster analysis.

Examining the Effect of Sustainability on Governance in HEIs

As stated before, the existing literature primarily focuses on analyzing the effect of governance on sustainability at universities (Sacchi et al., 2023; Amaral et al., 2020). Therefore, it is essential to investigate whether implementing sustainable practices in a university guarantees its governance development and maturity. However, future research should focus on filling this gap in the existing literature by developing theories and conducting investigations to explore the potential effect of sustainability on governance in universities.

Considering the Moderating Effects

The framework suggests that various moderators may influence sustainability and university governance relationships. Given these circumstances, variables such as ICT infrastructure and human capital categorization, which define capability building, serve as prerequisites for integrating sustainability concepts into university governance. Therefore, this study suggests identifying and analyzing relevant moderate variables to enhance existing knowledge.

Broadening Geographical Emphasis

Concerning the generalizability of the existing findings (Fehrenbach & Huisman, 2024; Snyder, 2019) was, as previously mentioned, the most significant concern. In qualitative research, analytical generalizability may be attained through replicating comparable findings across multiple case studies. In other words, when the arguments are based on literature and the findings impact a specific theory, development, or theoretical sequence of events that can explain similar events in other situations or contexts. The results of case studies may be generalizable to theoretical arguments. Therefore, future research can consider the replication of case studies across various contexts and nations to broaden and generalize hypotheses. Implementing such a methodology is expected to yield a comprehensive understanding of the scope in which sustainability may impact university governance and the prerequisites and contingencies that follow it. In quantitative research, the issue of statistical generalizability (Amaral et al., 2020) may be addressed by choosing a sample that is a good representation of the entire population and is not biased. In the future, researchers need to be careful about their sampling strategy,

explain why they chose the way they did, and use random sampling to avoid sampling bias.

Implications

This research provides university administrations with valuable information for making sustainable decisions. The findings can assist in identifying areas that could benefit from sustainability implementations and novel applications that can further improve efficiency. This requires that universities concentrate on the contribution and how sustainability could enhance governance models. Subsequently, managers would be responsible for fostering favorable perspectives regarding sustainability and strengthening good governance. Furthermore, a sustainable campus is also necessary for university sustainability, affecting governance. However, university governance must be adaptable and receptive to new situations and requirements. Administrative and leadership support is required to set policies and objectives for a sustainable campus. The role of university management is crucial, particularly in ensuring the implementation and achievement of the campus' sustainable policy (Leal Filho et al., 2023; Abubakar et al., 2020). Decisions about the institution's sustainability involve collective decision-making and the active participation of individuals at all levels. Competent leadership has the power to shape and advance sustainability initiatives. Considering the perspectives of all stakeholders in the decision-making process supports recognizing the requirements and distribution of pertinent information on the university's sustainability. However, a sustainable campus will improve the efficiency of governance at universities.

Likewise, this study draws researchers' attention to the existing research gap and investigates the findings of earlier studies that raise concerns with data collecting, generalizability, and research methodology (Sacchi et al., 2023; Abubakar et al., 2020). However, the limited geographic scope of case studies and the lack of thorough comparative studies at this time must be considered by researchers (Khan et al., 2021). Although literature includes numerous cross-country studies that offer a valuable means of conducting a broad comparison across a wide range of nations, these studies typically fail to clarify the underlying processes of the observed impacts or provide a comprehensive explanation for the observed disparities (Sacchi et al., 2023; Khan et al., 2021; Abubakar et al., 2020). Instead, the correlations between sustainability and governance might appear in various manners depending on the university. A university should avoid imitating the sustainability strategies of other universities without thoroughly examining and considering the socio-political, cultural, and economic disparities.

Conclusion

Governance, higher education, and sustainability are complex phenomena that complicate their integration. Governance encompasses all structures and procedures facilitating decision-making within the entire university institution. These decisions do not merely affect the university; it is increasingly clear that the reach of governance extends far beyond, encompassing the community where the university is situated and all stakeholders involved in its activities. Achieving strategic alignment between universities and sustainability is a challenge that necessitates a holistic, systematic, and long-term perspective. Governance tools require a certain level of maturity and robustness to be integrated with the concept of sustainability, as such integration is organizationally transformative.

However, this systematic literature review presents an exploratory study to explain how sustainability principles have been integrated into the governance of university institutions. To achieve this goal, this study used systematic literature review analysis and employed PRISMA (preferred reporting items for systematic

reviews and meta-analysis) to select and analyse articles. These articles were selected using an objective method of title, abstract, and keyword assessment, and the 102 most relevant articles were selected. The findings from these contents revealed exciting results in three steps; the first step is based on cluster analysis, which shows that environmental sustainability, like greening campus, and social sustainability, like transparency and accountability, enhance good governance. The second result is based on the systematic categories of literature, which suggests that prior research has been done on different categories, as presented in Table 1. Finally, this study employs an SLR methodology to comprehensively identify the various research gaps and opportunities for developing future research in sustainable governance in universities. This study identifies two main categories of research gaps: data-related research gaps and analysis-related research gaps. Based on these gaps, this study will find the direction of future research.

Moreover, this research has some restrictions and limitations as well. To guarantee the quality of publications collected, this review used databases. This method unavoidably left out publications like books, conference reviews, grey literature, and other sources of information that would have been helpful for the topic, triangulating details, or enhancing the analysis's findings. Therefore, the subject of the analysis and additional sources of information should be included in future research. Finally, this study used the results of prior investigations as a source of secondary data to accomplish the goals of this study. Future research, however, can gather primary data via surveys from significant participants from higher education institutions. Moreover, future research could investigate the effects of various governance models on sustainability outcomes and identify the best practices that may be adapted to varied institutional contexts.

Conflict of Interest

The authors affirm there is no conflict of interest.

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