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RESEARCH ARTICLE

Scoping Sustainability Practices in Higher Education Institutions: A Bibliometric and Systematic Review

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ABSTRACT

The standing of higher education institutions (HEIs) and their role in shaping the societal mind-set is crucial in promoting sustainable human behavior. Considered as the microsom of the broader societal setting, incorporating sustainability practices (SP) within institution is equally important, beyond merely teaching the courses. HEIs have been taking SP for long, though the degree of informed approaches was low in the past. However, in recent years the concept has become more informed and systematic and the subject is attracting researchers across the world. Thus, this study explores the scope of SP in HEIs worldwide, offering insights into strategies, trends, and gaps. For this, a total 964 articles have been considered for the bibliometric analysis and 44 peer-reviewed articles for systematic review, published between the year 2014 to 2023. The study identifies key dimensions and benchmarks of HEIs in embracing sustainable development. Using bibliometric analysis and thematic synthesis, the result highlights a significant increase in sustainability research, with 2023 marking a notable peak. Likewise, the systematic review exhibit an enormous evaluation of sustainability initiatives in HEIs from scattered efforts to integrative, campus-wide sustainability models. As strong as environmental, social and economic sustainability initiatives have been established, their inclination towards integration reinforces their long-term impacts. Balancing short-term institutional needs and overall sustainability objectives, however, remains problematic.

KEYWORDS: Sustainability, sustainability practices, higher education institutions, campus operation, sustainability assessment

INTRODUCTION

The conceptual foundations varies, yet phrases "sustainability" or "sustainable development" have become buzzwords in present development discourses. Academically, such discourse is earning important space in almost all field of studies. Thanks to the Brundtland Commission's "Our Common Future" Report that

defined sustainable development as "development that meets present needs without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987, p. 43). This simple and plausible definition greatly helped in popularizing the concept of sustainability. Bridging between the definitions sought by the scholars, it can be argued that sustainability is an act and interaction of every individual in their daily human activities. For example, every morning an individual takes a breakfast however, a sustainably aware person should think where it came from (food sourcing), how it was delivered (transportation), how is it prepared (energy consumption), how to clean plates (water conservation), what to do with unfinished food (waste management) and so on. Thus, the scope of sustainability is highly extending: reaching energy to synergy, wood to food, fallacy to policy and many more.

Sustainability in general revolves around three key pillers i.e. environmental, social and economic. According to Kuhlman and Farrington (2010), these dimensions are capitalized for protecting environmental health, societal equity and economic transparency. The tone and the priority of researchers differ however, in aggregate, there is a greater agreement that the wisdom HEIs shape on individual is the base for any development. HEIs can do this by preparing future sustainability leaders; exploring, identifying and innovating the changing sustainability dynamics; offering best practices to the greater society and creating collaboration with communities and stakeholders to combat with sustainability challenges. To support this argument, Cortese (2003) contend that HEIs are not only centers for learning and research but also microcosms of broader societal systems where innovative sustainable practices can be tested and modeled. Thus, in the context when global challenges such as climate change, resource depletion, and social inequality have been intensified, the integration of sustainability into HEIs has become highly crucial. Scholars have proposed several strategies to compact identified global sustainability challenges. Such strategies ranges from curriculum integration, interdisciplinarity, sustainable campus operation, digital transformation, leadership, institutional commitment, community partnership and others.

In global scale, HEIs are found to have initiating various sustainability measures. Such measures include analysis of carbon footprint, green practices and decentralized water systems. For example, Barron et al. (2021) analyzed the state of carbon footprint in HEIs of the United States, however argue that though achieving carbon neutrality is important, it should not be the ultimate objective of HEIs. This mean to say that the sustainability approach should have a holistic shape. Similarly, taking the practice from Ireland, Horan et al. (2019) studied the contribution of HEIs towards a low-carbon society, particularly through the development and promotion of solar photovoltaic (PV) technology. Based on the study, authors have proposed the concept of niche development that refers to the creation and support of emerging technologies and practices that have the potential to disrupt existing systems and contribute to broader societal change. Likewise, Lange Salvia et al. (2020) acknowledge the role of HEIs as a key players in promoting energy sustainability. HEIs can promote sustainability by developing educational programs that focus on renewable energy technologies, energy efficiency, and sustainable energy management. Offering interdisciplinary courses, research projects, experiential learning opportunities, promoting outreach activities and partnerships with local governments and businesses are other major strategies in this regard. In a similar note, Gormally et al. (2019) brings forward the pertinent issue of energy consumption by scientific laboratories in HEIs. The

study argue that continuous operation of fume hoods, climate control systems, and refrigeration units, equipment maintenance needs increases the demand of energy in laboratories.

Universities in Hong Kong have established 'Sustainable Campus Consortium (SCC)', aiming at collaborative sustainability effort by sharing resources, knowledge, and best practices to enhance sustainability on their campuses (Xiong & Mok, 2020). Unitedly, the consortium has been able in implementing effective and widespread sustainability initiatives which institutions would hardly achieve solely. Influenced by this consortium, HEIs in Hong Kong have incorporated sustainability goals into institutional missions, strategic plans, and performance indicators, Likewise, curriculum development, adoption of energy-efficient technologies, waste reduction and audit programs, water conservation strategies, green building designs and retrofitting, encouraging the use of public transport, cycling, and walking has been prioritized. Nevertheless, providing incentives for carpooling and electric vehicle use, organizing sustainability-themed events, workshops, and campaigns to educate students, faculty, and staff about sustainable living and working practices are other practices. Slightly varied, though similar practices have been implemented by HEIs across Saudi Arabia (Abubakhar et al., 2020) and Spain ((Bautista-Puig & Sanz-Casado, 2021). According to Schopp et al. (2020) who studied the case of the University of Tübingen in Germany, the university has implemented a comprehensive and integrated approach across its entire institution by embedding sustainability into all aspects of university operations, teaching, research, and community engagement. For example, it offers a range of courses and programs focused on sustainability and environmental issues, supports and promotes research projects that address environmental, social, and economic aspects of sustainability, encourages collaboration across disciplines and implements several environment friendly initiatives including energy efficiency, waste management, green building standards, engaging with the local and global community through outreach programs. The university has established a dedicated sustainability office and appointed a sustainability officer.

Leal Filho et al. (2022) studies the case based mainly in developed economies of Asia. The study reports that some HEIs in Asia have well-developed sustainability plans and others still in the early stages of implementation. Though, trend of integrating sustainability into the academic curriculum, increasingly focusing on sustainability-related research and varied campus sustainability initiatives and community engagement and outreach programs were growing.

Genuine implementation of sustainability approaches relies on the competency and capacity of the working human resource. Some scholars have studied the matter from this perspective. For example, Abbas et al. (2022) investigated the role of Green Human Resource Management (Green HRM), referring to the practice of recruiting, training, and developing employees with a focus on environmental sustainability, as well as encouraging eco-friendly workplace behaviors and policies. The author claim that Green HRM practices have a significant positive impact on the sustainability performance of HEIs which promotes a culture of sustainability within institutions, encouraging faculty, staff, and students to adopt eco-friendly behaviors. Similar study was conducted by Mohiuddin et al. (2022) by conceptualizing and exploring how universities can implement sustainable HRM practices. As per the author, sustainable HRM includes sustainability competencies in hiring processes and seeking candidates who align with the institution's sustainability values, providing training programs that focus on sustainability skills and knowledge, enabling employees to contribute to the

institution's sustainability goals, and incorporating sustainability objectives into performance appraisals and setting targets related to sustainability achievements for staff and faculty. Implementing environmentally friendly practices in office settings, such as energy-efficient lighting, recycling programs, and reducing waste, promoting work-life balance and employee well-being are part of a broader commitment to sustainability. Such commitment also include flexible working arrangements and wellness programs, fostering a diverse and inclusive work environment and ensuring equal opportunities and a supportive work culture.

Sustainable procurement on the other hand emphasizes purchasing goods and services in a way that minimizes negative environmental and social impacts while maximizing positive outcomes. In application of HEIs, according to Leal Filho et al. (2019), such practices include prioritizing eco-friendly products, requiring suppliers to meet environmental and social standards, and seeking products with certifications like Energy Star or Fair Trade.

Attention of HEIs towards sustainability assessment and reporting has globally increased in recent days. Some of such frameworks include Green Campus Program, STARS (Sustainability Tracking, Assessment & Rating System), and the Global Reporting Initiative (GRI) and UI GreenMetrics. These frameworks stand on their own unique strengths and weaknesses, often influenced by institutional goals and contexts. For example, the GRI standards offer a comprehensive approach for disclosing economic, environmental, and social impacts, while STARS provide a detailed assessment of sustainability performance across various institutional areas. This shift towards greater transparency reflects a broader movement towards aligning institutional practices with global sustainability goals, such as the SDGs and also enhance credibility but also address diverse stakeholder expectations (Leal Filho et al., 2022).

Authors argue that effective sustainability assessments can lead to improved practices and policies within HEIs. However, the impact is often limited by the level of commitment from institutional leadership and the integration of sustainability into the core mission of the institution (Caeiro et al., 2020). The tool, 'Governance Equalizer' can be useful in this regard which evaluates the effectiveness and balance of sustainability governance structures within HEIs, focusing on several key components of governance, including leadership commitment, policy integration, stakeholder involvement, and resource allocation. The system is holistic and dynamic in nature (Niedlich et al., 2020). There is significant variability in the transparency and comprehensiveness of sustainability reports. Some institutions provide detailed accounts of their contributions to the SDGs, while others offer limited information. The lack of standardization in reporting practices makes it challenging to compare and benchmark the sustainability performance of different HEIs. Difficulty in gathering accurate and consistent data across different departments and activities, limited resources and expertise for preparing detailed sustainability reports and absence of universally accepted reporting standards that could enhance comparability and credibility are major sustainability challenges (Caputo et al., 2021). Highlighting the local sensitivity, Du et al. (2020) challenge the existing global sustainability assessment and reporting frameworks and propose guidelines to prepare context specific tools. Such guideline encourages stakeholder's engagement, alignment with national policies, and integration with institutional goals.

To summarize, systems thinking (understanding the interconnectedness of systems), anticipatory competence (foreseeing future challenges), strategic competence (developing strategies for sustainable solutions), normative

competence (understanding and applying values of justice, equity, and sustainability) and interpersonal competence (collaborating effectively across disciplines and cultures) are the core competence of sustainability (Cebrián et al., 2021). Thus, sustainability competencies are highly dependent on multi-disciplinary and trans-disciplinary collaboration. Collaboration involves key components such as informed and active participation of stakeholders from academia, industry, government, and civil society working together to address real-world problems. According to Baumber, (2022), this is because, transdisciplinary education nurtures enhanced problem-solving skills by promoting creativity, critical thinking, and innovation, as students learn to integrate diverse viewpoints and methodologies.

This study attempts to underscore the key role of HEIs in cultivating sustainability-oriented mindsets and practices. As miniaturized representations of society, HEIs are uniquely positioned to model sustainable behaviors, incubate green innovations, and educate future leaders capable of addressing complex environmental, social, and economic challenges. Thus, by synthesizing a wide range of scholarly perspectives and institutional practices, the study aims to offer a comprehensive landscape of how HEIs around the world are embedding sustainability within their teaching, research, campus operations, community engagement, and governance structures. Through a dual bibliometric and systematic review approach, it maps out strategies such as curriculum integration, green human resource management, energy-efficient campus infrastructure, stakeholder collaboration, and sustainability reporting mechanisms like STARS and GRI. The study's significance lies in its holistic scope, multi-regional insights, and multidisciplinary lens, which together help highlight best practices and existing gaps. It not only catalogues progress but also highlights areas needing standardization, innovation, and stronger institutional commitment.

METHODS

This study tracks the bibliometric analysis followed by PRISMA method for the review of articles related to sustainability practices in higher education (SPHE). For this, the cumulative information of articles published in this area was retrieved using dimensions.ai using the sting words "Sustainability Practices" AND "Higher Education". A total of 800,826 articles published in 10 years (from 2014 to 2023) were reported in doing so. This data was limited by selecting the option of finding key words in 'Title and Abstract'. Doing so, significantly low number of articles (2090) were reported. Again, the data was limited only to research articles (excluding book chapters, proceedings) and 1380 articles reported. Furthermore, selection was made based on accessibility and only openly accessed articles were selected to limit in 964 articles (See Table 1). Open access articles were selected due to the limitation in purchasing capacity of the researcher. This cumulative information was exported and applied for bibliometric analysis using R software.

Table 1

Overview of Retrieved Data for Bibliometric Analysis

Item	Value
Timespane	2014:2023
Sources (Journals, Books, etc)	582
Documents	964
Annual Growth Rate %	27.2
Document Average Age	3.62
Average Citations Per Document	13.44
References	19451

For the purpose of systematic literature review, the data was further limited manually by applying the criteria of citation number. Articles that were cited at least for 10 times were considered for further proceeding. By

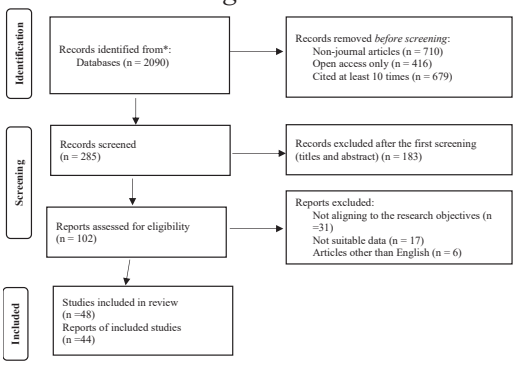
doing so, a total of 285 articles were found to be eligible.

Table 2
Inclusion and Exclusion Criteria for Systematic Review

Characteristic	Inclusion criteria	Exclusion criteria
Sting	"Sustainable Practices" AND "Higher Education"	All other than sting
Sting search in	Title and abstract	All other except in title and abstract
Temporal horizon	January 2014 to December 2023	All articles published before January 2014 and after December 2023
Document type	Journal articles	All other except journal articles
Access	All open	Non-open
Language	Only English	Other than English
Alignment	Aligned to research objectives	Non-aligned to research objectives

After this, the title and abstract were individually reviewed by the researcher and irrelevant 183 articles were excluded from study. The remaining 102 articles were further analyzed based on the criteria of alignment to research objectives, data suitability and language. Further 54 articles were excluded in application of these criteria. Finally, best matching 44 articles over remaining 48 articles were selected for full review. This process has been reflected in PRISMA flow diagram (see Figure 1).

Figure 1
PRISMA Flow Diagram



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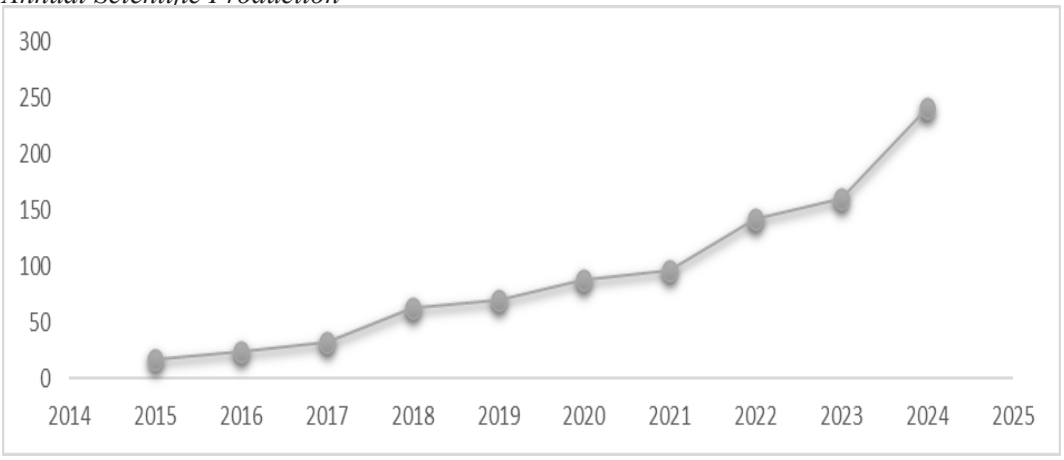
RESULTS AND DISCUSSION

Bibliometric Analysis

This bibliometric analysis is based on key metrics such as annual scientific production, influential journals, prolific authors, geographical distribution of research, and thematic focuses revealed through word cloud and co-occurrence network analyses. The field of SPHE has seen a progressive increase in scientific output over the years, which signifies a growing recognition of the importance of sustainability within academia. Initially, the growth was steady, reflecting a gradually expanding interest among researchers. However, a notable increase occurred in 2023, marking a significant rise in the volume of publications (Figure 2).

Figure 2
Annual Scientific Production

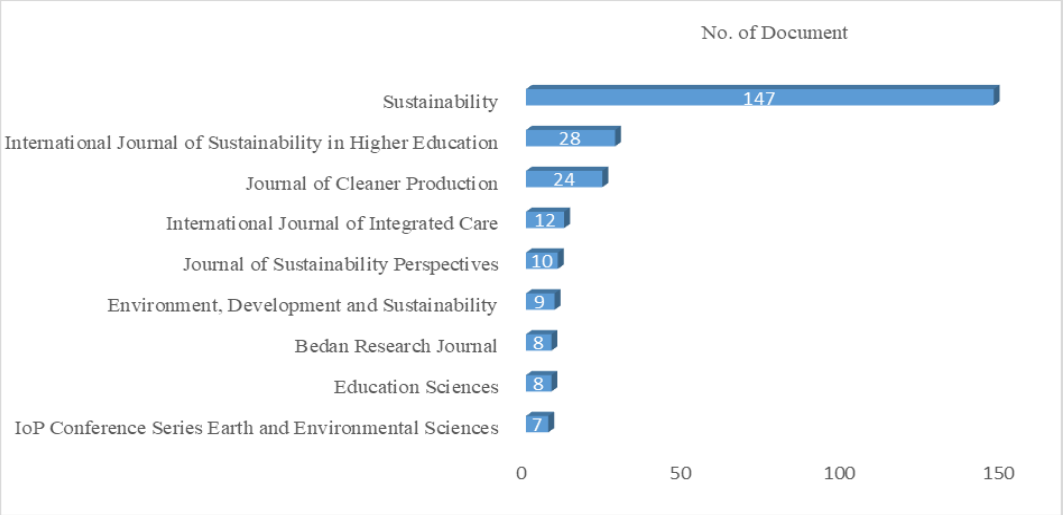


This increase indicates that sustainability practices in HEIs have become a priority area for academic inquiry, potentially driven by global calls to action on sustainability and the integration of the United Nations' Sustainable Development Goals (SDGs) into higher education strategies.

The analysis of publication sources on the other hand reveals that the journal "Sustainability" stands out as the leading platform for disseminating research (147 articles) on SPHE.

Figure 3

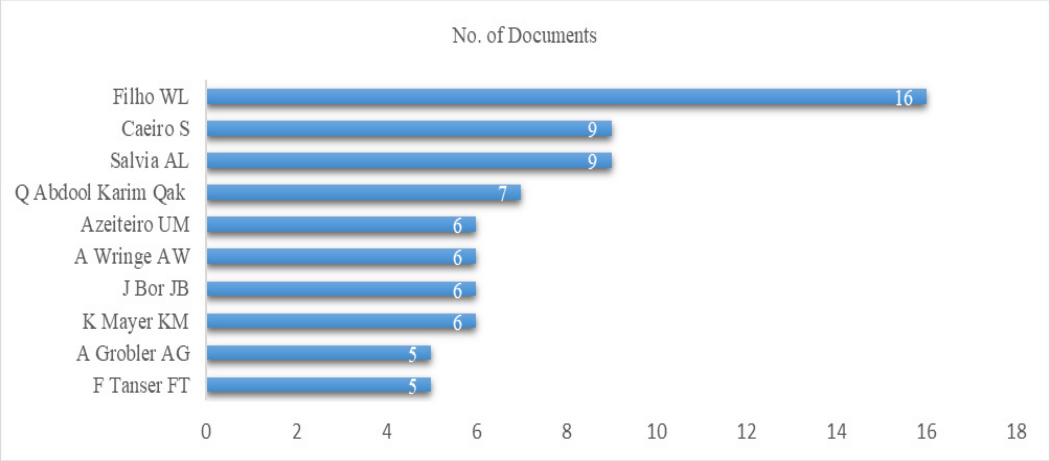
Journals Publishing the Highest Number of Articles



This journal consistently publishes the highest number of articles in this field, far overtaking other journals (Figure 3). The dominance of "Sustainability" reflects its broad scope and appeal to researchers interested in various aspects of sustainability, including those specifically focused on higher education. Other journals also contribute to the discourse but do so to a much lesser extent, which could be due to their more specialized focus or narrower scope within the sustainability domain.

Figure 4

Authors with the Highest Number of Articles



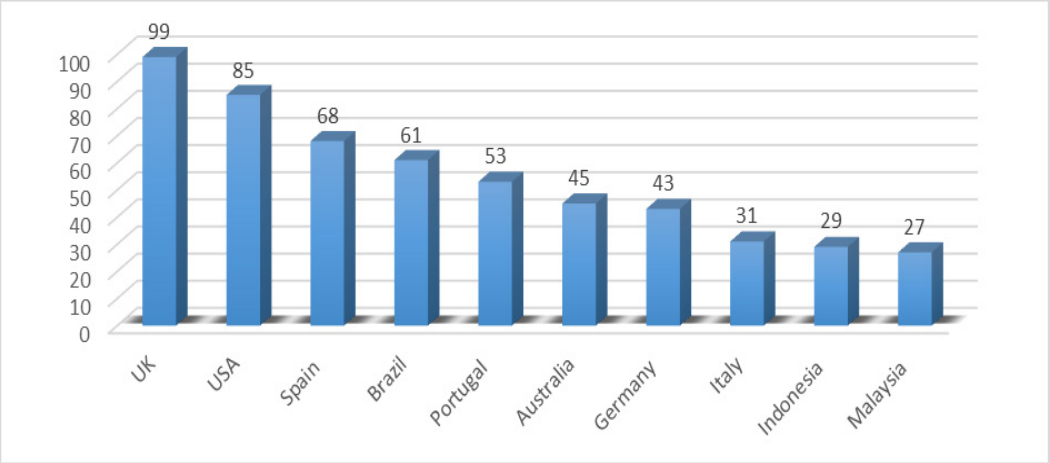
Likewise, figure 4 examines the most prolific authors in the field. The result show that Walter Leal Filho emerges as the leading figure, having published 16 articles. His contributions underscore his significant role in shaping the research agenda in this

area. Following him are Sandra Caeiro and Amanda Lange Salvia, each with 9 articles. Other authors such as Abdool Karim, Wringe AW, Azeiteiro UM have also published notable number of articles in this area. These authors are key influencers in the field, contributing to the development and dissemination of knowledge on how HEIs can adopt and scale sustainability practices. Their collective work forms a substantial part of the academic foundation for future research and policy-making in SPHE.

Similarly, the geographical analysis of publications reveals that the majority of research on SPHE originates from developed countries, including the UK, USA, Spain, Portugal, and Australia (Figure 5). Interestingly, Brazil, a developing nation as classified by the Human Development Index (HDI), also features prominently in the list.

Figure 5

Publication by the Country



This suggests a global interest in sustainability practices in higher education, with both developed and developing countries recognizing the importance of integrating sustainability into academic institutions. The presence of research from countries like Brazil, Indonesia, and Malaysia highlights the relevance of sustainability practices in contexts with different economic and developmental challenges, reflecting the universal applicability of SPHE research.

Again, Figure 6 reflects the word cloud generated from the abstracts of SPHE articles provides a visual representation of the most frequently occurring terms, offering insights into the central themes of the research. Terms such as "education," "sustainability," "development," and "research" are prominent, indicating that these are core areas of focus in the literature. Additionally, terms like "students," "university," "practices," "institutions," "learning," "teaching," and "management" also appear frequently, suggesting that the implementation of sustainability practices within the operational and educational frameworks of HEIs is a key concern for researchers. This thematic analysis highlights how sustainability is being integrated into various aspects of higher education, from curriculum development to institutional management.

Figure 6

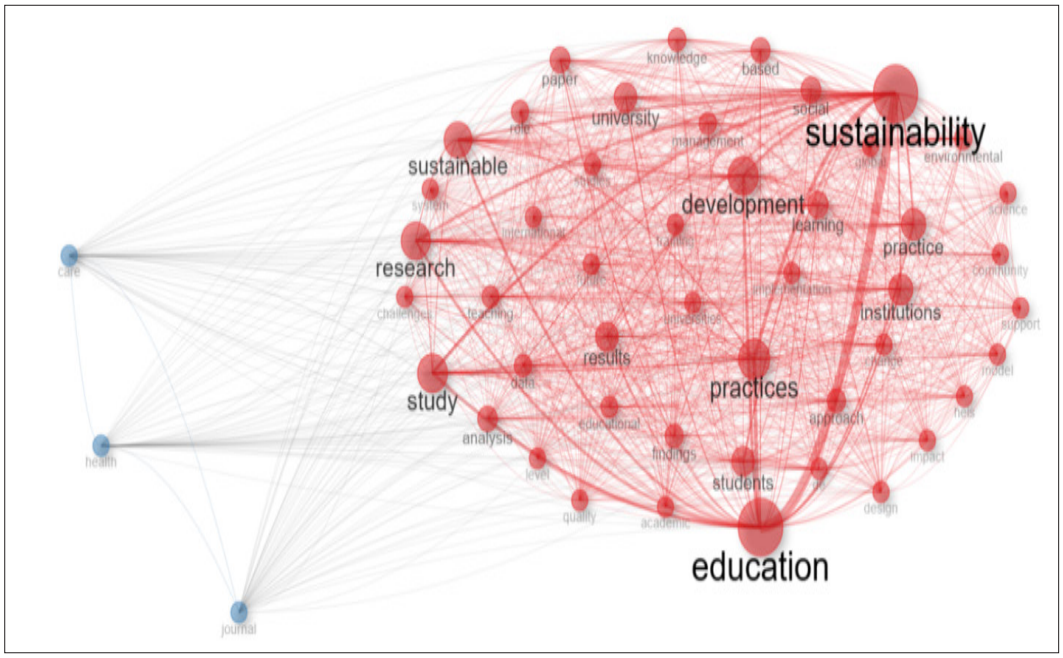
Word Cloud

Finally, the co-occurrence network analysis further elaborates on the relationships between key themes identified in SPHE research. This analysis reveals a dense network of interconnected concepts, with sustainability and education at the core. The strong connections between terms like "practices," "development," "institutions," and "learning" demonstrate how these themes are intertwined in discussions about how to effectively implement sustainability in higher education (Figure 7). The network highlights the complexity and multifaceted nature of sustainability practices in HEIs, indicating that successful implementation requires a holistic approach that considers various institutional and educational dimensions.

This bibliometric analysis demonstrates the growing importance of sustainability within higher education. The increasing number of publications and international scope of research, with contributions from both developed and developing nations, underscores the global relevance of sustainability practices in HEIs. The thematic analyses through the word cloud and co-occurrence network provide a deeper understanding of the key issues and interconnections in this field, offering a comprehensive picture of the current state of SPHE research and pointing towards future directions.

Figure 7

Co-occurrence Network



Systematic Review

HEIs are promoting sustainability through a variety of measures. In terms of the environment, they are strengthening waste management systems, increasing energy efficiency, and implementing renewable energy sources. Further to this, HEIs are also promoting social justice, encouraging community involvement, and incorporating sustainability into their curricula. In order to match financial practices with environmental goals, institutions are investing in green infrastructure and engaging in sustainable procurement.

HEIs are establishing themselves as leaders in environmental stewardship by embracing these diverse sustainability efforts. These initiatives not only lessen the effects on the environment but also educate pupils.

Table 3
Identified Sustainability Practices by Researches under Various Thematic Areas

	Subdomain	Specific activities	Authors
Environmental	Carbon Footprint & Energy	- Carbon footprint analyses and solar photovoltaic (PV) promotion - Energy efficiency measures (e.g., reducing lab energy demand, upgrading HVAC, fume hood management) - Interdisciplinary courses and research on sustainable energy	Barron et al. (2021), Horan et al. (2019), Lange Salvia et al. (2020), Gormally et al. (2019), Garrido-Yserte & Gallo-Rivera (2020)
	Water Management	- Decentralized water systems integrating rainwater harvesting and wastewater recovery - Campus-wide water conservation strategies	Xiong & Mok (2020), Abubakar et al. (2020), Bautista-Puig & Sanz-Casado (2021)
	Waste Management	- Waste audits, reduction, and recycling programs - Composting food waste with on-campus vegetable gardens - Adoption of reusable drink cups to reduce single-use plastics	Wang et al. (2022), Torrijos et al. (2021), Leal Filho et al. (2021)
	Sustainable	- Green building designs and retrofitting for energy efficiency - Integration of sustainability into campus operations and strategic plans	Schopp et al. (2020), Xiong & Mok (2020)
	Sustainable	- Promotion of public transport, cycling, and walking - Incentives for carpooling and electric vehicle use	Xiong & Mok (2020)
Social	Education & Awareness	- Integrating sustainability into academic curricula - Offering interdisciplinary courses, experiential learning, and research projects - Hosting public lectures and sustainability-themed events	Lange Salvia et al. (2020), Schopp et al. (2020), Leal Filho et al. (2022), Bautista-Puig & Sanz-Casado (2021)
		- Establishing sustainability consortiums and dedicated sustainability offices - Embedding sustainability goals in institutional missions, policies, and performance indicators - Engaging internal and external stakeholders	Xiong & Mok (2020), Niedlich et al. (2020)
	Social Equity & Inclusion	- Promoting diversity, equity, and inclusion in academic and operational practices - Implementing policies that ensure equal opportunities and a supportive work culture	Bautista-Puig & Sanz-Casado (2021), Mensah (2019)
	Community Engagement	- Partnering with local organizations for community energy audits and environmental projects - Conducting sustainability awareness campaigns and outreach programs	Schopp et al. (2020), Leal Filho et al. (2022)
	Sustainable Procurement	- Incorporating sustainability criteria into purchasing decisions (e.g., lifecycle cost, eco-friendly products, supplier standards) - Emphasis on digital tools and data analytics for procurement	Leal Filho et al. (2019)
Economic	Green Human Resource Management (HRM)	- Recruiting and training with a focus on sustainability competencies - Integrating sustainability into performance appraisals, workplace practices, and employee well-being initiatives	Abbas et al. (2022), Mohiuddin et al. (2022)

DISCUSSION AND CONCLUSION

Over the past decade, the role of HEIs in nurturing and promoting sustainability has expanded from a conceptual ideal into a practical and institutionalized reality. The findings traced through bibliometric and systematic reviews reveals a growing momentum in this scope. HEIs are increasingly seen as active participants in shaping sustainable societies, not only as centers for learning and research. As demonstrated in the review of 964 bibliometric entries and 44 systematically analyzed peer-reviewed studies, the scope of sustainability practices within HEIs is both vast and rapidly evolving. Earlier efforts in HEIs often approached sustainability in isolated, domain-specific ways. But recent trends point towards a notable shift. The year 2023, in particular, marked a peak in academic output on sustainability in higher education, suggesting a deepening institutional commitment and an increasingly integrated model of engagement. Sustainability is no longer relegated to environmental clubs or elective courses; rather, it has emerged as a cross-cutting institutional value.

Environmental initiatives remain central to this movement. Studies such as those by Barron et al. (2021), Horan et al. (2019), and Salvia et al. (2020) show how institutions have been auditing their carbon footprints, retrofitting their campuses for energy efficiency, and even developing interdisciplinary curricula centered around renewable energy and energy policy. Laboratory energy use, for example—once overlooked—has become a focal point in energy conservation efforts, as highlighted by Gormally et al. (2019). Likewise, water conservation and decentralized water management systems have been implemented in various contexts, including in Hong Kong and Saudi Arabia (Xiong & Mok, 2020; Abubakar et al., 2020). These examples underline how sustainability is becoming a physical, operational reality on campuses, not just a philosophical one. At the same time, institutions like the University of Tübingen have adopted campus-wide sustainability strategies that embed environmental values into teaching, research, and community engagement (Schopp et al., 2020).

Yet, the environmental aspect is only one leg of the three-pillar model of sustainability. Social sustainability and economic sustainability are other important pillars. As the reviews indicate, education for sustainable development is now more than curriculum content—it is pedagogy, student engagement, community involvement, and institutional governance. Salvia et al. (2020) and Leal Filho et al. (2022) highlight the importance of integrating sustainability into formal education through interdisciplinary programs, experiential learning, and public-facing events. On the other hand, collaborative governance structures, such as the Sustainable Campus Consortium in Hong Kong (Xiong & Mok, 2020), exemplify how universities are embedding sustainability into their organizational operations. From establishing sustainability offices and policies to engaging local communities and global partners, HEIs are acting as nodes in a wider network of change. As Niedlich et al. (2020) argue, such systemic approaches to governance can enhance both internal coherence and external impact.

Social equity has also emerged as another vital concern. Institutions are increasingly aware that their sustainability efforts must be inclusive—promoting diversity in hiring, creating equitable workplace environments, and ensuring access and fairness in academic settings (Bautista-Puig & Sanz-Casado, 2021; Mensah, 2019). Sustainability, after all, is as much about who benefits as it is about what is preserved. In the similar way, economic sustainability, often less visible, has received significant attention as well. Green procurement practices, as described by Leal Filho et al. (2019), are being aligned with environmental goals, pushing institutions to source ethically and prioritize

eco-friendly materials. Equally, the human resource dimension is being transformed. Green HRM practices, explored by Abbas et al. (2022) and Mohiuddin et al. (2022), show how recruitment, training, and performance appraisal systems are being reconfigured to support sustainability values and competencies.

Despite these advancements, challenges persist in assessment and standardization of sustainability practices. Although frameworks like GRI, STARS, and UI GreenMetrics have been adopted by many HEIs, their uneven application and lack of cross-institutional comparability limit their utility (Caeiro et al., 2020; Caputo et al., 2021). The Governance Equalizer, a tool proposed by Niedlich et al. (2020), attempts to bridge this gap by evaluating the institutional governance structure surrounding sustainability, yet it remains underutilized. Du et al. (2020) further challenge the global frameworks, advocating instead for context-specific tools that resonate with local institutional realities and stakeholder needs.

What these diverse practices and reflections collectively suggest is that HEIs are not only engaging with sustainability in terms of compliance or reputation—they are increasingly embedding it into their core missions. This transformation is both educational and organizational, requiring not only knowledge but also governance, infrastructure, and cultural alignment. Ultimately, the course of sustainability in higher education is promising but contingent. The evidence affirms that universities can indeed be microcosms of broader sustainable societies—modeling ethical procurement, cultivating inclusive work environments, and shaping future leaders with competencies in systems thinking, strategic foresight, and collaborative problem-solving (Cebrián et al., 2021; Baumber, 2022). However, realizing this potential requires continuous leadership commitment, stakeholder engagement, and innovation in assessment and implementation strategies.

As HEIs move forward, their role as laboratories of sustainability should be further translated into places where ideas are not only taught but promoted through lived experiences. In the face of climate change, social inequality, and resource constraints, the work being done in and through higher education offers not just hope, but a roadmap for systemic, sustainable transformation. HEIs are making substantial progress towards sustainability, yet there are challenges in establishing are challenges fully integrated, long-term strategies. Environmental, social, and economic sustainability initiatives must move beyond separate projects to be embedded in overall frameworks congruent with institutional missions. Strengthening governance, transdisciplinary collaboration, and leveraging digital innovations are at the heart of placing sustainability at the center of institutional priority and not at the margin. Such challenges require continued research, cross-sectorial partnerships, and an embracing of systemic change.

STUDY LIMITATIONS

While this review provides a comprehensive overview of sustainability practices in HEI. However, the reliance on secondary data sources and the varying methodologies of the included studies may limit the generalizability of the findings. Additionally, the focus on only journal articles that too only open access articles and the defined time span of 10 years may have excluded valuable insights from others. The heterogeneity of the studies reviewed, in terms of research design, geographical context, and institutional focus, also presents challenges in drawing uniform conclusions across different settings.

AUTHOR CONTRIBUTIONS

I declare that this manuscript is originally produced by me.

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