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Promoting sustainable development via stakeholder engagement in higher education

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Abstract

Background Higher education institutions (HEI) are uniquely positioned to contribute to sustainable development through education, research, community engagement, and policy influence. In this context, stakeholder engagement is recognised as an important strategy, since involving diverse groups in decision-making processes, HEIs can harness a wealth of perspectives, expertise, and resources, fostering more inclusive, innovative, and effective approaches to sustainability. There is a perceived need for studies that explore the contribution of various stakeholders in higher education, and suggest ways to optimise their participation in processes. Against this background, this paper seeks to bridge the gap between theoretical frameworks of stakeholder engagement and practical applications within the context of sustainable development in higher education.

Results By examining 29 real-world case studies and best practices, this paper provides actionable insights and guidance for HEIs to enhance their sustainability efforts. Findings from the analysis of cases in Europe, Africa, Asia, and North and South America were consolidated into ten guidelines for HEIs seeking to promote sustainable development through stakeholder engagement. The analysis of trends identified three clusters: (i) HEI's role in sustainable development through stakeholder engagement and Sustainable Development Goals (SDGs); (ii) human-centred sustainability via transformative learning and community empowerment; and (iii) education and interdisciplinary approaches to sustainability.

Conclusions The nature of the work performed, and the scope of the activities of HEIs put them in a key position to drive sustainable development by engaging diverse stakeholders across academic and societal contexts, including students, faculty, administration, industry partners, and the broader community. Inclusive participation and interdisciplinary educational programmes that integrate sustainability across curricula are key to effective stakeholder engagement. In addition, institutional commitment, including strong leadership and strategic policies, is essential for advancing sustainability initiatives, while partnerships with local communities and industries amplify the practical impact of sustainability efforts while addressing real-world challenges.

Keywords Sustainable development, Stakeholder engagement, Stakeholder management, Higher education, Universities

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Introduction

Sustainable development is a multifaceted concept that demands the integration of economic growth, social equity, and environmental protection, ensuring that the needs of the present are met without compromising the ability of future generations to meet their own needs [73, 77, 80, 84].

The significance of sustainable development lies in its comprehensive approach to improving the quality of life for all people without increasing the use of natural resources beyond the capacity of the environment to supply them indefinitely [25]. It addresses the global challenges we face, including poverty, inequality, climate change, environmental degradation, peace, and justice. The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 SDGs, which are an urgent call for action by all countries in a global partnership [9, 61, 78].

The intricate balance between the three dimensions (social, environmental and economic) emphasises the complexity of achieving sustainability and underscores the critical need for the engagement of a wide range of stakeholders. This engagement is not just beneficial but necessary for fostering a shared vision of sustainability and for the practical implementation of solutions that are both effective and equitable [57].

Today, there is an extensive research stream on stakeholder theory, documenting the benefits of stakeholder engagement. A stakeholder is defined as any group or individual that can influence or be influenced by the achievement of the organisation's objectives [31]. Further specifying, Savage et al. [23, 67, 68].

Stakeholder engagement in HEIs has become an increasingly significant topic, as these institutions continually seek innovative approaches to interact with and involve both their internal and external stakeholders [20]. To date, there is a growing research stream that applies stakeholder analyses to HEIs, revealing complex findings and diverse applications [75] [20]. For example, [42, 43] highlight the significance of knowledge and information sharing, mutual trust, stakeholder involvement in decision-making, and interest alignment to strengthen relationships and create greater value between HEIs and their stakeholders. In this context, sustainability and its promotion have become particularly important topics in the interactions between HEIs and their internal and external stakeholders [20]. Stakeholder engagement serves as a key mechanism for driving sustainable development and aligning the interests of HEIs with broader societal goals. As universities move towards a more sustainable future and reshape their relationship with their stakeholders, a shift in perspective appears promising, placing HEIs at the centre of stakeholder engagement. This reshaping of relationships is not only crucial for fostering sustainability but also necessary to differentiate themselves from other HEIs, positively setting them apart and ensuring long-term success. This need for differentiation underscores the importance of reshaping stakeholder relationships, aligning them with sustainability goals. As a result of their critical role in education, research, and societal interaction, HEIs are uniquely positioned to engage stakeholders and act as catalysts for sustainable development, as highlighted by [20]. Figure 1 depicts a conceptual framework illustrating the role of HEIs in stakeholder engagement for sustainable development.

Key stakeholders in sustainable development include national governments, local authorities, the private sector, civil society, HEIs and the general public. Each group has a unique role to play and a vested interest in the sustainability of economic, social, and environmental systems, which can be described as follows:

(a) National governments are responsible for creating policies that drive sustainable development. They can enact laws that protect the environment, support social equity, and foster economic growth that benefits all layers of society. These, in turn, are implemented by local governments, which oversee the steps needed to realise government policies [26, 39].
(b) The private sector (businesses) contributes by adopting sustainable practices that reduce

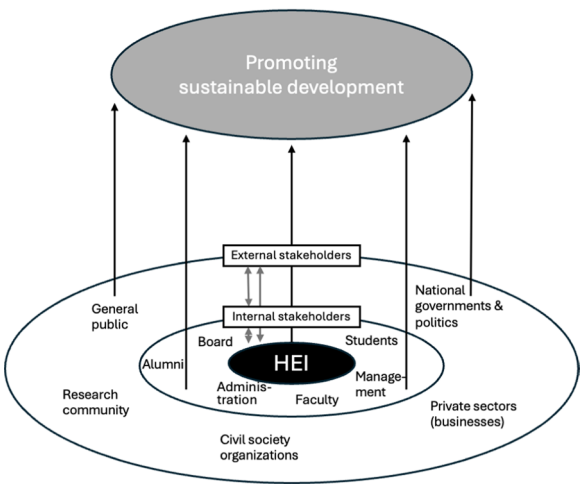

Fig. 1 Framework for promoting sustainability through stakeholder engagement in HEIs. *Source* Authors' own creation

environmental impacts and by innovating new technologies and solutions for sustainable development challenges. Corporate social responsibility (CSR) initiatives can also support social and environmental goals [53, 65].

(c) Civil society organisations (CSOs), including non-governmental organisations (NGOs), community groups, play an important role crucial role in advocating for sustainability, educating the public, and holding other stakeholders accountable [1, 5, 70].

(d) HEIs undertake research, foster education on sustainable development via teaching programmes and foster critical thinking on its processes [4, 71].

(e) The general public influences sustainable development through consumer choices, political participation, and community involvement (i.e., active participation of local stakeholders in decision-making, planning, and implementation of sustainability initiatives). Public awareness and education on sustainability issues are essential for driving change from the bottom up [29, 58].

The need for such a broader stakeholder engagement is based on the fact that sustainable development challenges are complex and interrelated. Engaging a diverse group of stakeholders brings in a wide range of perspectives, knowledge, and expertise, leading to more innovative and effective solutions [84]. There is another, practical reason, for a broader stakeholder engagement: the responsibility for sustainable development does not lie with any single entity. By involving various stakeholders, a sense of shared responsibility and collective action may be promoted, which is more likely to result in significant and lasting changes [24, 28, 57].

Moreover, engaging stakeholders in the decision-making process increases the legitimacy of sustainability initiatives. It also ensures that different interests are considered, leading to greater buy-in and support from the community, which is critical for the successful implementation and longevity of sustainability projects [24, 57].

But to succeed, stakeholder engagement on sustainable development needs to be inclusive, transparent, and structured [12]. This involves a broader understanding of who the stakeholders are, their interests, and how they are affected by sustainable development initiatives is the first step in engaging them effectively. Also, it needs to be based on building partnerships and networks, creating platforms for collaboration among different stakeholders [57]. This can leverage resources, expertise, and influence, making sustainable development efforts more successful. Moreover, ensuring that all stakeholders have access to information and opportunities to participate in discussions and decision-making processes is important [24, 40]. Finally, to yield the expected benefits, there is a need to regularly assess the outcomes of stakeholder engagement and sustainability initiatives. This helps in learning and adapting strategies as needed. Providing feedback to stakeholders also keeps them informed and involved [15, 72].

The path to sustainable development is complex and challenging, requiring the collective effort of all segments of society [54]. The engagement of stakeholders is not just a strategic approach to achieving sustainability goals but a necessity for ensuring that the development is inclusive, equitable, and capable of meeting the needs of both present and future generations. Through collaborative efforts, open communication, and shared responsibilities, we can work towards a sustainable future that balances economic growth with social equity and environmental protection, ensuring a better planet for all [73, 80, 84].

Against this background, this paper aims to address the following key questions: How can theoretical frameworks of stakeholder engagement be translated into practical applications to advance sustainability in HEIs? How do HEIs engage stakeholders to drive sustainability initiatives through leadership, education, industry collaboration, and professional development? What strategies exemplify successful stakeholder engagement in driving sustainability within HEIs?

Background: sustainable development and stakeholder engagement in higher education

Stakeholders play a vital role in shaping a sustainability policy for HEIs that is both internally and externally supported, and integrated into all policies and vision statements [44, 45]. Beyond considering both internal and external stakeholders, it is essential to account for additional aspects and inputs [83].

To avoid common pitfalls such as fragmentation and lack of coordination among internal initiatives, addressing these issues from the outset is crucial. This proactive approach results in a more robust project, one that gains support from a variety of internal stakeholders across disciplines, facilitating smoother communication both internally and externally. Conducting a materiality analysis upfront is recommended to align the HEI's sustainability priorities with the goals of external stakeholders in the region. These external stakeholders should represent a range of disciplines (for a holistic vision) and include participants from the quadruple helix: HEIs, the community, government and regulatory bodies, and industrial partners [69].

Engaging external stakeholders more meaningfully ensures they are not only inspired by HEI projects,

but also feel motivated to support and follow them. Figure 1 illustrates how the initiative evolves from an internal concept to a project that incorporates input and interaction from external stakeholders.

As Geels [33] proposes and illustrated in Fig. 2, the transition in this case study starts with a small transition team, where individuals present ideas in various existing forums (Step 1). This leads to the formation of a change coalition (Step 2), which serves as a platform to consolidate and amplify innovation [69].

Within HEIs, it is critical to adopt a broad, interdisciplinary approach while involving diverse stakeholders. The change coalition should therefore comprise internal stakeholders with varied backgrounds and roles. This inclusivity fosters sustainability efforts across the institution, preventing fragmentation and maintaining internal support. Ensuring direct connection with the HEI's general director and top policymakers is also crucial. Introducing sustainability into policy frameworks (aligned with the 17 UN SDGs) (Fig. 2, Step 3) guarantees coherence and internal backing.

The HEI undergoes a paradigm shift from a traditional institution to one driven by the SDGs. In the next stage (Fig. 2, Step 4), external stakeholders are brought in to support the institution in meeting these objectives [30] [79]. Participants in the change projects integrate existing practices into the learning process, allowing these practices to adopt new, sustainable approaches and overcome barriers. As the transition progresses, the change team evolves into a broader change network, involving external partners [81]. This strategy results in a cohesive approach that not only sends a clear external message, but also fosters co-ownership and co-creation, essential values for a HEI. Moreover, it ensures sustainability is viewed not as a temporary trend, but as a long-term commitment.

There is also the direct route, where companies directly engage with HEIs in student challenges and project-based work placement. This brings the HEI into contact with another major stakeholder, the established professional. They were educated before the current emphasis on sustainability, and they may prove to be an obstacle to implementing change. How can the HEI influence them? Perhaps they can broaden their horizons to offer micro-credentials, specifically geared towards sustainability. The focus by professional accreditation bodies has also seen changes implemented. While not fully co-creation, the ability to be agile and respond to stakeholder demand is evident [10, 22].

Stakeholder engagement could usefully be interpreted to mean exerting influence as broadly as possible. This can be through leadership in the operation of the HEI's themselves, by longer term influence based on educating students for sustainability, collaboration and innovation with industry. It could also include continued professional development opportunities for the practitioners and decision-makers in industry.

HEIs play a crucial role in fostering sustainability through their extensive networks, which encompass government agencies, private sector organisations, and other academic institutions. These connections facilitate collaboration on large-scale sustainability initiatives. Quist and Tukker [63] highlight that achieving sustainability necessitates a strong integration of innovation, learning, and cooperation among government, educational institutions, and financial stakeholders. To successfully embed sustainability in education, structured multi-stakeholder engagement is essential. HEIs provide an ideal environment for fostering such collaborations. International research projects can strengthen partnerships between HEIs and reinforce commitments to sustainable development. Moreover,

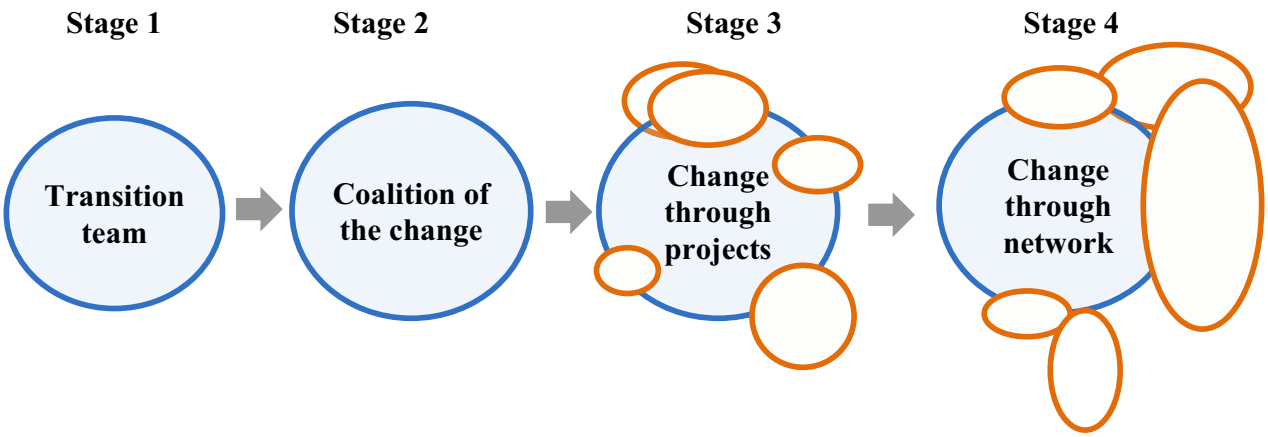

Fig. 2 Transition scheme. *Source* Authors' own creation

academic conferences and inter-institutional initiatives contribute to advancing Education for Sustainable Development (ESD) on a broader scale. Given their existing collaborations with the private sector and government through research activities, HEIs are well-positioned to leverage and expand these relationships, thereby enhancing the effectiveness of sustainability initiatives in higher education [55].

Aung and Hallinger [7] examined the leadership practices that facilitate and promote sustainability within HEIs. Their findings categorise these practices into several key areas, including the development of a clear leadership vision, the transformation of campus facilities and operations to support sustainability objectives, the integration of sustainability principles into research and academic programmes, the cultivation of a sustainability-driven institutional culture, and the encouragement of active community engagement.

Sustainability leadership at all levels of a university—from the governing council to the student body—plays a crucial role in strengthening the institution's engagement with society [41]. This can be achieved through various strategies, including research and development, living labs, and service learning [52]. These approaches foster a two-way process of knowledge generation, where students and faculty collaboratively learn "with" and "through" the community. Such knowledge co-creation aligns with stakeholder theory, which emphasises the value of engaging external stakeholders in shared learning and decision-making processes [32]. Kantabutra [41] further argues that exchanging knowledge with stakeholders contributes to business continuity and corporate sustainability. In the context of higher education, leadership practices that promote knowledge-sharing and co-creation can drive community development and advance broader sustainability goals [7]. By actively promoting sustainability, universities not only enhance the quality of life within their communities, but also serve as role models and integral stakeholders in fostering pro-sustainability behaviours [37, 52].

Despite the growing body of research on stakeholder engagement in sustainability initiatives within HEIs, significant gaps remain in understanding its practical effectiveness and long-term impact. First, while existing studies emphasise the importance of involving internal and external stakeholders [44, 45, 83], there is limited empirical analysis on how stakeholder engagement translates into measurable sustainability outcomes within HEIs. Research often discusses engagement strategies at a conceptual level but lacks in-depth evaluation of the mechanisms that drive success or failure in real-world applications.

Second, most studies focus on the role of HEIs as facilitators of sustainability transitions [33, 69] but do not critically assess how stakeholder dynamics evolve over time, particularly in response to institutional resistance, shifting priorities, and external influences such as policy changes or funding constraints.

Finally, while leadership and institutional commitment are frequently cited as key drivers of sustainability efforts [7, 41], research has not fully explored the interplay between top-down governance structures and grassroots stakeholder initiatives within HEIs. This gap limits our understanding of how institutional hierarchies and power dynamics shape stakeholder engagement in sustainability transitions.

Methods

Seeking to bridge the gap between theoretical frameworks of stakeholder engagement and practical applications within the context of sustainable development in higher education, this study employed a combination of systematic review and analysis of trends, alongside the introduction and examination of real-world case studies. These methods aimed to identify and present successful instances of stakeholder engagement in driving sustainability within HEIs. The following sections outline the detailed approach taken for each method and how the outcomes contribute to the overall study.

Systematic review approach and analysis of trends

A systematic review was conducted to collate and synthesise findings from existing studies that addressed the formulated research question: How do HEIs engage stakeholders in sustainability initiatives? This review followed explicit, systematic methods to ensure a comprehensive and unbiased synthesis of relevant literature.

The systematic review was structured around three core themes: (a) sustainability and related concepts; (b) stakeholder engagement; and (c) HEIs. A brainstorming session was initially conducted to generate relevant terms for each core theme (Table 1), followed by discussions to prioritise and reduce these terms.

Based on that, the final search string used was: (['sustainab*' OR 'responib*' OR 'conscious*' OR 'green' OR 'eco*' OR 'ethical' OR 'climate' OR 'SDG*'] AND ['stakeholder*' OR 'peer*' OR 'member*' OR 'engagement' OR 'participation'] AND ['HEI' OR 'high* education' OR 'universit*' OR 'student*' OR 'faculty' OR 'academic'].

The search was performed on the Scopus database, focusing on publications in English from January 2004 to April 2024, with the condition that the full text was

Table 1 Core themes and related keywords

Core theme	Keywords
Sustainability	Sustainability, Sustainable, responsibility, Responsible, Conscious, Consciousness, Fair, Green, Environment, Environmental, Resources, Eco-friendly, Renewable, Low-impact, Low-carbon, Ethical, Zero-waste, Low-waste, Carbon–neutral, Regenerative, Climate-friendly, Resource-efficient, Biodegradable, Energy-efficient, Clean, Eco-conscious, Eco-efficient, Nature-friendly, Planet-friendly, Earth-friendly, Earth-first, Ocean-friendly, Multi-generational, Global goals, Gender equality, Reduced inequalities, Good health, Well-being, Inclusive, SDG
Stakeholder	Stakeholders, Peers, Participants, Members, Partners, Collaborators, Colleagues, Community (engagement), Engagement, Participation, Collective action
Higher education institution	HEI, Higher education, Education, research, University, Teaching, Academic institutions, Applied science, Bachelor/undergraduate, Master/graduate, Student, Faculty, Critical thinking, Case, Case studies, Best practices

Source Authors' own creation

available. Initially, 479 documents were identified. After a rigorous screening process, following the PRISMA protocol, the following documents were excluded: 23 articles were not in English, 7 articles were not peer-reviewed, 100 articles did not fit the context of our analysis in terms of content, 108 articles speak of "school" not HEI, 26 articles articulate the "wrong" meaning of sustainability (i.e., talk about "time-stable" nor sustainable in the sense of the SDG). Thus, the dataset was reduced to 215 relevant entries.

The 215 documents were analysed using VOSviewer software for bibliometric and trend analysis. This analysis was crucial for identifying key patterns, influential studies, and emerging themes within the literature on stakeholder engagement in HEI sustainability initiatives. Understanding these trends helped contextualise the case studies and provided a foundation for proposing actionable insights.

Selection and analysis of case studies

The selection of 29 case studies from the initial sample of 215 documents was guided by specific criteria to ensure relevance, depth, and alignment with the research objectives. First, studies were required to explicitly describe real-world stakeholder engagement initiatives within HEIs, detailing their implementation and outcomes. Second, selected cases needed to demonstrate a direct connection to sustainability, ensuring that stakeholder participation contributed meaningfully to sustainable development within the institution. Third, priority was given to cases that provided clear methodological descriptions, allowing for an in-depth understanding of the engagement process, involved actors, and contextual factors influencing success or challenges. Additionally, geographic diversity was considered to capture a broad range of institutional and cultural contexts. Lastly, studies that offered critical reflections, impact assessments, or discussions on best practices were favoured, ensuring that the selected cases provided not only descriptive accounts, but also analytical insights into stakeholder engagement strategies.

Thus, the selected case studies provided empirical evidence on how stakeholder collaboration is structured, the mechanisms used to drive sustainability, and the challenges and success factors identified in different institutional contexts. Moreover, the sample covered a diverse range of geographic regions, including institutions from Cameroon, South Africa, Zambia, China, Malaysia, Saudi Arabia, Indonesia, Jordan, Scotland, Portugal, Sweden, Italy, Spain, Hungary, Belgium, the United Kingdom, Poland, Turkey, Canada, the USA, Chile, and Brazil. This diverse sample ensured a comprehensive understanding of global practices and challenges.

Each case study was thoroughly analysed to identify key topics, effective practices, and challenges faced during the implementation of sustainability initiatives. Insights were derived from the experiences of universities across different continents, focusing on the strategies employed to engage various stakeholders such as students, faculty, administration, local communities, and businesses.

Case analysis is a vital component of this study as it provides practical, real-world examples of how theoretical frameworks of stakeholder engagement can be applied within the context of sustainable development in higher education. By examining these cases, the study highlights successful strategies, common challenges, and innovative practices that other institutions can adapt to enhance their sustainability efforts. This international perspective ensures that the proposed guidance and actionable insights are relevant and applicable across different cultural and institutional contexts.

Results and discussion

Analysis of trends

Key thematic areas were identified through the VOSviewer software's term co-occurrence analysis. As shown in Fig. 3, the node size reflects the frequency of occurrences, while the link width indicates the strength of connections. Closely related terms form distinct thematic clusters. The greater the likelihood of two terms co-occurring, the more likely they are to form a thematic cluster, which is represented by different colours in a network graph [79] (van Eck and Waltman 2011).

In examining the co-occurrence of keywords, three distinct clusters emerge, each represented by a different colour: green, blue, and red. The green cluster, which has the most connections, links higher education with sustainable development, encompassing terms such as engagement, stakeholders, student engagement, SDGs, and similarities. The red cluster focuses on the human aspect of the articles, including keywords like experiment, perception, psychology, work engagement, and schools. The blue cluster illustrates the connection between sustainability and various educational themes, incorporating terms such as students, education, learning, teaching, stakeholder, and community engagement.

This analysis underscores the critical role of HEIs in advancing sustainable development, represented by the green cluster. A growing trend within this cluster is the alignment of HEIs with the SDGs. The integration of SDGs into institutional strategies enhances HEIs' ability to drive sustainability across multiple sectors [16]. This connection highlights the increasing responsibility of HEIs in preparing students to incorporate sustainability into their careers and daily lives [44, 45]. Moreover, the strong presence of "stakeholder engagement" within this cluster suggests a shift towards more participatory approaches, where universities collaborate with external actors to co-develop sustainability solutions. This evolution indicates a growing emphasis on multi-stakeholder governance structures in higher education sustainability initiatives.

The red cluster reveals an intersection between sustainability and behavioural sciences, emphasising psychological and perceptual aspects of stakeholder

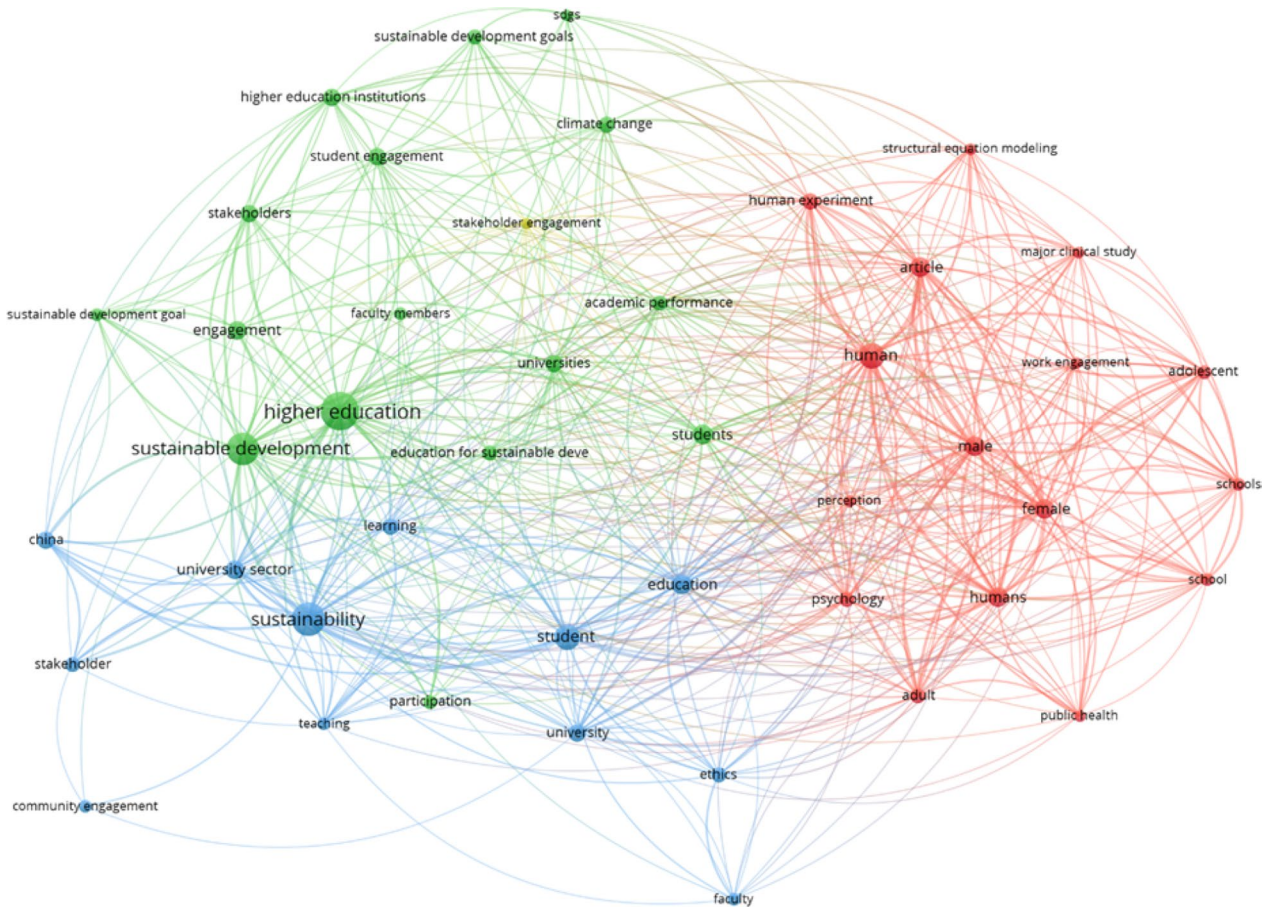

Fig. 3 Co-occurrence of the terms—VOSviewer output. *Source* Elaborated by the authors using VOSviewer

engagement. The prominence of terms such as "perception", "psychology", and "work engagement" suggests an increasing academic focus on understanding how individuals and groups internalise and respond to sustainability efforts within HEIs. Studies like Cottafava et al. [19] demonstrate that transformative learning and managerial skills play a crucial role in fostering engagement, reinforcing the idea that sustainability education is not merely about knowledge transfer but also about mindset shifts and behavioural change. This trend underscores the importance of addressing cognitive and emotional dimensions when designing stakeholder engagement strategies, as effective sustainability transitions require more than institutional policies—they necessitate changes in attitudes, motivation, and agency among stakeholders.

The blue cluster highlights the integration of sustainability into teaching and learning practices, reflecting the pedagogical dimension of stakeholder engagement. The presence of keywords such as "education", "learning", and "teaching" suggests an ongoing effort to embed sustainability into curricula and instructional methodologies. This trend is evident in studies like Vandaele and Stålhammar [82], which emphasise the need for interdisciplinary and transformative education models. By connecting sustainability with various social science disciplines, this cluster underscores the importance of critically examining institutions, structures, norms, and power dynamics to ensure effective education for sustainable development (ESD). Furthermore, the prominence of "community engagement" in this cluster signals an expansion of HEIs' educational missions beyond the classroom, incorporating experiential learning and real-world applications. This evolution points to a broader shift toward applied sustainability education, where students engage directly with societal challenges through problem-based learning, service-learning projects, and living labs.

By exploring these clusters in greater depth, it becomes evident that stakeholder engagement in higher education is evolving in multiple directions. The green cluster highlights a macro-level institutional shift toward integrating sustainability into governance and strategy. The red cluster points to the need for behavioural and psychological insights to enhance engagement effectiveness. The blue cluster underscores the role of pedagogical innovation in fostering a sustainability-oriented mindset among students and faculty. Together, these trends reflect a multidimensional approach to sustainability in HEIs, illustrating both opportunities and challenges in aligning institutional structures, individual behaviours, and educational practices toward a more comprehensive and impactful stakeholder engagement strategy.

Analysis of cases

Based on the analysis of the sample, 29 real cases were selected, including examples from Africa, Asia, Europe, North America and South America. Table 2 shows the key information about the cases selected.

The analysis of cases focused on identifying effective practices to promote sustainable development via stakeholder engagement in higher education. In this study, "effectiveness" refers to the success of stakeholder engagement actions, as evidenced by the implementation of the analysed cases. Rather than focusing on metrics or other evaluative approaches to measure effectiveness, this study aims to elucidate the practices themselves, emphasising how stakeholder engagement contributed to the realisation of sustainability initiatives within HEIs. Therefore, the analysis is grounded in real cases and the concrete execution of these initiatives, demonstrating the role of stakeholder engagement in fostering sustainable transformations in HEIs.

Insights from African universities

The cases from Cameroon, South Africa, and Zambia illustrate that sustainable development in African contexts is closely linked to effective stakeholder engagement. Key themes emerge from these examples:

- **Mutual trust and collaborative frameworks**: Building mutual trust between universities and local communities is crucial for successful engagement. Collaborative frameworks that involve community members in the decision-making process foster a sense of ownership and commitment to the projects.
- **Relevance and local context**: Ensuring that academic endeavours are relevant to the local context enhances the impact of university initiatives. Engaging local voices and Indigenous knowledge ensures that the solutions developed are culturally appropriate and address specific community needs.
- **Capacity building through co-learning**: The co-learning approach, as seen in the South African case, demonstrates that when universities and communities learn together, it leads to more effective capacity building and sustainable outcomes. This method promotes shared knowledge creation and application, which is critical for innovation and development.

Table 2 Cases of HEIs promoting SD via stakeholder engagement

Continent	Case(s)	Country	Key topic	References
Africa 	African universities	Cameroon	Local voices into the university's mission to foster sustainable development	Mbah [50]
	University of Johannesburg	South Africa	Co-learning approach to bridge the knowledge gap between universities and disadvantaged communities	Habiyaremye [36]
	University of Zambia	Zambia	Integration of Indigenous knowledge into the university's community engagement strategies	Mbah et al. [51]
Asia 	Ningbo University and University of Nottingham Ningbo China	China	Differences in sustainable development practices between culturally different universities	Dawodu et al. [21]
	Five Malaysian private institutions	Malaysia	Role of student engagement in promoting green entrepreneurship	Chatterjee et al. [17]
	Saudi higher education institutions	Saudi Arabia	Sustainability practices in HEIs from the perspective of faculty members	Al Ali and Aboud [2]
	Thai universities	Indonesia	Stakeholder perceptions between Green Campus and Non-Green Campus universities	Tiyarattanachai and Hollmann [76]
	University of Jordan	Jordan	Factors influencing student participation in the Green-Smart Campus initiative	Al-Dmour [3]

Table 2 (continued)

Continent	Case(s)	Country	Key topic	References
Europe 	University of Córdoba	Spain	Education for Sustainable Development and environmental education, awareness, and training in the university environment	Gomera et al. [34]
	Eight universities belonging to the Catalan Association of Public Universities	Spain	Economic value and the social value created for all the organisation's stakeholders through a participatory and systematic process	Ayuso et al. [8]
	University of West of Scotland Paisley	Scotland	HEIs' levels of awareness and disclosure of sustainable practices	Raji and Hassan [64]
	Seven Portuguese public universities	Portugal	HEIs contributions to better development and regional transformation	Pedro et al. [60]
	Technical university	Sweden	Implementation of sustainable development in educational programmes at a technical university	Högfeldt et al. [38]
	University of Molise	Italy	Stakeholders' perception about the university role in promoting a regional development	Forleo and Palmieri [27]
	University of Northampton	UK	Efficacy of student engagement with sustainability projects	Cleverdon et al. [18]
	University of Salamanca	Spain	Climate emergency declaration (CED) in HEIs	Reyes-Carrasco et al. [66]
	University of Szeged	Hungary	Role of social justice orientated university community engagement	Málovics et al. [49]

Table 2 (continued)

Continent	Case(s)	Country	Key topic	References
	Vrije Universiteit Brussels	Belgium	Promotion of sustainable behaviour of university members	Macharis and Kerret [48]
	University of Bristol	UK	HEIs involvement in citywide sustainability initiatives	Bigg et al. [11]
	Wrocław University of Science and Technology	Poland	Incorporation of sustainability concepts in employee and student environment	Brdulak and Stec [13]
Europe/Asia (transcontinental)	Yildiz Technical University	Turkey	Association between stakeholders' materiality and the SDGs	Aras et al. [6]
North America 	Stetson University in Florida	USA	Balancing financial and sustainability demands in construction projects in HEIs settings	Subramanian and Demoss [74]
	University of Wyoming	USA	Role of civic engagement in fostering sustainability among students	Press et al. [62]
	University of British Columbia (UBC)	Canada	Formation and implementation of the Sustainable Development Policy in HE	Moore [56]
	University of Toronto	Canada	Student engagement and sustainability integration into the university's course management system	Brugmann et al. [14]
	University of Calgary	Canada	SDG Alliance at the HEIs, a student-led initiative that empowers students to engage with the SDGs	Lee et al. [46, 47]

Table 2 (continued)

Continent	Case(s)	Country	Key topic	References
	University of Georgia	USA	Participation of students in sustainability programmes	Lee et al. [46, 47]
South America 	Universidad del Desarrollo	Chile	Role of entrepreneurial university ecosystems in achieving the SDGs	Guerrero and Lira [35]
	Centro Universitario Municipal de Franca, Uni-FACEF	Brazil	Stakeholder networks' roles in achieving the SDGs	Paucar-Caceres et al. [59]

Source Authors' own creation

- **Community-centric engagement**: Universities must prioritise community-centric engagement by actively involving local stakeholders in research and development projects. This approach not only benefits the communities, but also enriches the academic institutions with practical insights and diverse perspectives.

Insights from Asian universities

The cases from China, Malaysia, Saudi Arabia, Indonesia, and Jordan demonstrate that sustainable development in Asian universities is closely linked to effective stakeholder engagement. Several key themes emerge:

- **Comparative and context-specific approaches**: Understanding the unique strengths and challenges of different university models, as seen in the Chinese case, allows for more effective ESD implementation tailored to specific contexts.
- **Youth and student engagement**: Engaging students in sustainability efforts, as evidenced by the Malaysian and Jordanian cases, is crucial for fostering a culture of sustainability and innovation. Universities that support and motivate students can significantly enhance their contribution to sustainable development.
- **Faculty insights and strategic vision**: Leveraging faculty perspectives, as highlighted in the Saudi Arabian case, can identify gaps and opportunities for improvement in sustainability practices. A strategic vision and dedicated committees are essential for advancing sustainability in higher education.
- **Benchmarking and best practices**: Adopting recognised sustainability frameworks, such as the UI GreenMetric, can drive significant improvements in campus sustainability and stakeholder satisfaction, as shown in the Indonesian case.

Insights from European universities

European universities are actively engaging in a wide range of sustainability initiatives, emphasising the importance of stakeholder involvement, transparent communication, and strategic planning. Key insights from these studies include:

- **Engaging all stakeholders**: Effective sustainability practices require active participation from all stakeholders, including students, staff, and external community members. Programmes like the Trébol Programme and the climate emergency declaration at the University of Salamanca demonstrate the impact of inclusive, participatory approaches.
- **Integrated thinking**: Universities need to adopt integrated thinking to align sustainability goals with broader institutional strategies. This involves comprehensive frameworks for measuring, reporting, and communicating sustainability efforts, as seen in the ISV analysis in Catalonia and the proposed frameworks in Turkey.
- **Educational integration**: Sustainability must be embedded into educational curricula and research agendas. Initiatives in Sweden and Portugal highlight the importance of involving academics and students in sustainability efforts, promoting long-term commitment and innovation.
- **Regional development**: Universities can significantly impact regional sustainability through partnerships and community engagement. Studies from Italy and Portugal illustrate how universities can drive regional transformation by integrating sustainable practices into their operations and collaborations.
- **Challenges and barriers**: Despite progress, universities face challenges in fully implementing sustainability initiatives. Common barriers include limited resources, lack of comprehensive frameworks, and varying stakeholder priorities. Addressing these challenges requires coordinated efforts and strategic investments.
- **Innovative approaches**: Unique methodologies and innovative approaches, such as the positive sustainability framework at Vrije Universiteit Brussels and the AHP/ANP framework in Turkey, provide valuable models for other institutions seeking to enhance their sustainability efforts.

Insights from North and South American universities

North and South American universities are engaging in diverse sustainability initiatives, emphasising stakeholder involvement, policy integration, and innovative approaches. Key insights from these case studies include:

- **Stakeholder engagement**: Effective sustainability initiatives require addressing the diverse needs and expectations of stakeholders, as illustrated by the Stetson University case and the stakeholder networks at Uni-FACEF. Engaging students, faculty, and the community is crucial for the success of these initiatives.
- **Educational integration**: Embedding sustainability into educational programmes and research agendas is essential. Universities like UBC and the

University of Toronto demonstrate the importance of comprehensive policies and inventories to integrate sustainability into academic and extracurricular activities.

- **Inclusive participation**: Ensuring diverse representation in sustainability programmes is vital. Studies from the University of Georgia highlight the need for inclusive strategies to engage students from various backgrounds, promoting equity and diverse perspectives in sustainability efforts.
- **Student leadership**: Supporting student-led initiatives can significantly enhance sustainability engagement. The University of Calgary's SDGA showcases how empowering student leaders can foster a deeper commitment to the SDGs and drive grassroots change within institutions.
- **Innovative methodologies**: Utilising innovative approaches, such as soft systems methodology at Uni-FACEF, can help manage the complexity of sustainability initiatives and enhance stakeholder collaboration. These methodologies provide valuable frameworks for other institutions seeking to improve their sustainability efforts.
- **Regional development**: Universities can drive regional sustainability through community engagement and entrepreneurial ecosystems. The Universidad del Desarrollo case highlights how universities can contribute to sustainable development by addressing local and global challenges through their core activities.

The 29 case studies from universities across various continents analysed reveal common patterns in advancing sustainability through stakeholder engagement. A fundamental aspect is the integration of all stakeholders—both internal, including students, faculty, and administrative staff, and external, encompassing local communities, industries, policymakers, and non-governmental organisations. The successful implementation of sustainability initiatives depends on addressing the diverse needs, expectations, and priorities of these stakeholders, fostering a shared vision and long-term commitment. Mutual trust, collaboration, and continuous dialogue are crucial in ensuring that sustainability projects remain relevant, impactful, and culturally appropriate across different regional contexts.

A particularly noteworthy finding is the pivotal role of students and youth in driving sustainability and innovation. Their engagement is not merely a byproduct of institutional efforts but a critical force shaping the future of sustainability in higher education. Universities that embed sustainability within their curricula not only strengthen student motivation but also create a long-term cultural shift toward sustainability-conscious professionals. Furthermore, integrating sustainability into research agendas serves as a key driver for faculty involvement, encouraging interdisciplinary approaches that address complex sustainability challenges.

Beyond curricular integration, universities play a strategic role in building bridges between academic knowledge and real-world applications. Sustainability efforts gain greater traction when academic institutions align their research and outreach activities with the specific socio-economic and environmental needs of their local and regional communities. Collaborative frameworks that promote co-learning between universities and external stakeholders have proven particularly effective, as they foster mutual understanding and knowledge exchange. This participatory model, based on equity and shared decision-making, enhances the practical applicability of sustainability initiatives and reinforces their long-term impact.

Institutional leadership emerges as a decisive factor in the success of sustainability initiatives. Universities with clear strategic visions and dedicated sustainability commitments are more likely to develop cohesive policies that integrate sustainability across governance structures, research priorities, and operational practices. The effectiveness of these efforts is further amplified by the adoption of innovative methodologies, such as sustainability benchmarking, stakeholder networks, and participatory governance models. These tools enable institutions to assess progress, identify best practices, and adapt strategies to their specific contexts.

Despite the diversity of regional and institutional settings, these findings underscore the universal importance of inclusive participation, community-centric engagement, and capacity building. The integration of sustainability into higher education requires a multi-dimensional, collaborative approach that leverages the strengths of various stakeholders. By fostering interdisciplinary learning, encouraging co-creation with communities, and embracing adaptive and innovative frameworks, universities can play a transformative role in advancing global sustainability. The key insights derived from these case studies are translated into concrete operational guidelines in the following section.

Actionable insights and guidance for HEIs

Based on the insights from real cases from around the world, ten guidelines were formulated for HEIs seeking to promote sustainable development through stakeholder engagement (Table 3).

The guidelines proposed in the research paper serve as actionable insights for HEIs by offering a structured

Table 3 Guidelines for HEIs seeking to promote SD through stakeholder engagement

Guidelines	Actions
1. Embed community perspectives	Integrate local community insights and needs into the university's knowledge creation and dissemination processes to ensure development efforts are relevant and effective
2. Foster mutual trust and commitment	Build and maintain mutual trust and shared commitment among all stakeholders, including national governments, private sector, civil society organisations, and citizens, to optimise collaborative efforts
3. Culturally relevant approaches	Address socio-economic, political, and environmental issues in ways that are culturally sensitive and relevant to ensure sustainability initiatives are well-received and impactful
4. Support student and staff engagement	Actively support and motivate students and staff by providing resources, leadership opportunities, and recognition to translate their engagement into tangible, sustainable actions
5. Establish dedicated sustainability committees	Form dedicated committees focused on sustainability initiatives and adopt best practices from successful institutions to drive continuous improvement and stakeholder satisfaction
6. Enhance communication and transparency	Develop methods to measure and communicate the social value created by the university, increasing accountability and transparency with stakeholders through integrated thinking and reporting
7. Integrate sustainability into education	Develop comprehensive sustainability curricula and community-engaged learning opportunities, fostering sustainable skills and competencies among students and staff
8. Construct efficient participatory mechanisms	Implement efficient participatory mechanisms using bottom-up approaches to ensure inclusive and effective community involvement in sustainability initiatives
9. Balance financial and sustainability goals	Carefully manage the trade-offs between financial considerations and sustainability objectives in university projects, preparing for potential unexpected impacts and challenges
10. Adopt inclusive and systemic approaches	Use systemic approaches to clarify stakeholder roles and formalise action networks, ensuring inclusive recruitment and diverse representation in campus sustainability efforts

Source Authors' own creation

approach to effectively engage diverse stakeholders in their sustainability initiatives. These guidelines provide concrete strategies for involving students, faculty, administration, local communities, governments, private sector, and civil society in decision-making processes, ensuring a comprehensive representation of perspectives and expertise.

By examining real-world case studies and best practices, the paper translates theoretical frameworks into practical applications, enabling institutions to implement inclusive and innovative sustainability efforts. This approach not only enhances the relevance and impact of sustainability projects, but also fosters a sense of shared responsibility and collaboration among all involved parties, ultimately driving more effective and sustainable outcomes. By leveraging these guidelines, HEIs can harness the collective power of their stakeholders, leading to more robust and resilient sustainable development practices.

Whereas stakeholder engagement in higher education is important for promoting sustainable development, there are several challenges can impede effective collaboration. One major challenge is the lack of awareness or understanding of the importance of stakeholder engagement among faculty, students, and administration. Many stakeholders may not recognise how their involvement can contribute to sustainable development objectives, which can lead to apathy or reluctance to participate. To address this, institutions should implement educational programs that emphasise the value of stakeholder engagement and its benefits for both the institution and the community.

Another significant challenge is the power imbalance among stakeholders, where certain groups may dominate discussions or decision-making processes. For instance, faculty members may inadvertently overshadow student voices or external partners, leading to a narrow perspective on sustainability initiatives. Mitigation measures include establishing inclusive decision-making frameworks that ensure all stakeholders have an equal opportunity to contribute. Institutions can create committees that represent diverse groups and facilitate open dialogues to promote equal representation and encourage varied viewpoints.

Additionally, logistical issues such as time constraints and competing priorities often hinder stakeholder participation. Faculty and administrators may struggle to balance their academic responsibilities with engagement efforts, resulting in minimal involvement. To counter this, institutions could schedule regular engagement activities during designated times to accommodate stakeholders' availability. Incorporating stakeholder engagement into course requirements or institutional objectives can help align priorities and encourage participation without overburdening individuals.

Lastly, inadequate communication channels can lead to misunderstandings and disengagement. Stakeholders may struggle to access information or may not feel

informed about ongoing initiatives. Implementing cannot communication strategies, such as newsletters, workshops, and social media platforms, can enhance transparency and keep all parties informed. By addressing these challenges through targeted actions, HEIs can foster more effective stakeholder engagement and advance SDGs.

Conclusions

This paper has investigated the integration of sustainable development principles into higher education through stakeholder engagement. It fills in a gap in respect of research on theoretical frameworks of stakeholder engagement on the one hand, and practical applications on the other, within the context of sustainable development in higher education. It also examined a set of real-world case studies, presenting some examples of best practices.

The conclusions from this paper have been derived through a robust methodology that includes qualitative analysis of case studies, stakeholder interviews, and surveys conducted across various institutions. By examining multiple perspectives, the research highlights how diverse stakeholder involvement—encompassing students, faculty, industry partners, and community members—significantly contributes to integrating sustainability into educational frameworks and practices.

The study provides strong evidence that collaborative engagement fosters innovation, enhances student learning experiences, and cultivates a culture of sustainability within HEIs. Thus, it can be concluded that meaningful stakeholder engagement is vital for achieving SDGs in academic settings.

The first conclusion which can be derived from the paper is related to the fact that the nature of the work performed, and the scope of the activities of HEIs put them in a key position, in fostering sustainable development by engaging various stakeholders, including students, faculty, administration, industry partners, and the broader community.

Also, the experiences from the paper indicate that successful stakeholder engagement requires a holistic approach that encompasses a set of important elements. The first one is inclusive participation. Engaging a diverse range of stakeholders ensures that multiple perspectives are considered, leading to more comprehensive and effective sustainability initiatives. HEIs should create platforms that facilitate dialogue and collaboration among all relevant parties. A second element is linked with educational programmes. Much can be gained by incorporating sustainability into the curriculum across disciplines. It not only helps to raise awareness, but may also equip students with the knowledge and skills needed to address sustainability challenges. Ideally, study programmes should be designed to be interdisciplinary, reflecting the interconnected nature of sustainable development issues.

A third element is related with institutional commitment. Strong leadership and institutional commitment to sustainability are very helpful in facilitating the implementation of ideas. This includes establishing clear policies, dedicated sustainability offices, and integrating sustainability into the strategic goals of the institution.

Finally, building strong partnerships with local communities and industries can enhance the impact of sustainability efforts. Such collaborations can provide practical experiences for students and address real-world sustainability challenges.

There are some key theoretical and empirical gaps that the paper has addressed. For instance, the gap on research that highlights the diversity of effective engagement with diverse stakeholders, including students, faculty, administrators, and external partners, which is essential for integrating sustainable development into higher education curricula and practices. The study has also shown that the advantages of collaborative approaches, which may foster innovation, enhance learning experiences, and create a culture of sustainability within institutions. A second gap is seen in respect of the need for use of experiential learning opportunities, such as project-based initiatives and community partnerships, significantly improve stakeholder involvement.

In terms of key findings, a set of key ones are:

(a) Inclusivity ensures diverse perspectives are considered, leading to more innovative and holistic sustainability solutions.
(b) Co-creation of sustainability strategies and policies increases stakeholder ownership, commitment, and long-term support for initiatives.
(c) Feedback mechanisms and regular reporting on progress help maintain accountability and adapt strategies based on stakeholder input.

These findings underscore the importance of inclusivity, collaboration, and communication in fostering effective stakeholder engagement for sustainable development in higher education.

This research underscores the value and role of stakeholder engagement in advancing sustainable development within higher education. In respect of the research question "How do HEIs engage stakeholders in sustainability initiatives?", the answer is two-fold. Firstly, by actively involving diverse groups—such as students, faculty, industry partners, and local

communities—institutions can cultivate a more inclusive and innovative approach to sustainability challenges. The findings reveal that meaningful collaborations not only enhance educational outcomes but also foster a culture of sustainability across campuses. Secondly, HEIs need to prioritise developing structured frameworks for stakeholder engagement, ensuring that all voices are heard and valued, ultimately driving effective sustainable development strategies that benefit both the institution and the wider community.

It is also important to note what cannot be concluded from this study. While the findings illustrate the benefits of engagement, they do not establish a direct causal relationship between specific engagement strategies and sustainability outcomes. The research is qualitative in nature, lacking quantifiable measures of success or comparative analyses across differing engagement models. Therefore, further research is necessary to identify best practices, determine the effectiveness of various engagement strategies, and quantitatively assess their impact on sustainable development initiatives within higher education.

The contributions of this paper to theory and practice are twofold. The first is the fact that it has identified the thematic focus on the topic currently being given by the literature, and this is helpful in pointing out some areas where improvements are needed. For example, there is a need for studies on the effectiveness of Stakeholder Engagement initiatives. Secondly, the examples from various geographical regions show that the theme is emerging, and its relevance is becoming increasingly acknowledged.

This study addresses a perceived knowledge gap concerning the theoretical frameworks and empirical evidence around effective stakeholder engagement within HEIs. While the importance of stakeholder involvement in advancing sustainable development is recognised, there is a lack of comprehensive studies that illustrate successful models and practices. The paper seeks to bridge this gap by presenting theoretical insights, and data demonstrating how active engagement with diverse stakeholders—such as students, faculty, industry partners, and community members—can facilitate the integration of sustainable development principles within educational frameworks. From the experiences gathered, we can list a set of 5 elements which are needed to make stakeholder involvement on sustainability in higher education effective:

- Inclusive engagement: Identify and involve a diverse range of stakeholders, including students, faculty, staff, administrators, alumni, local communities, industry partners, and government bodies. Ensure representation from underrepresented groups to foster equity and inclusivity in decision-making processes.
- Clear communication and transparency: Establish open and consistent communication channels to share goals, progress, and challenges related to sustainability initiatives. Use accessible language and multiple platforms (e.g., meetings, newsletters, social media) to keep stakeholders informed and engaged.
- Collaborative decision-making: Involve stakeholders in co-creating sustainability strategies, policies, and actions to ensure their needs and perspectives are reflected. Use participatory approaches like workshops, focus groups, and advisory committees to foster ownership and commitment.
- Capacity building and education: Provide training, resources, and workshops to empower stakeholders with the knowledge and skills needed to contribute effectively to sustainability efforts. Integrate sustainability into curricula, research, and campus operations to embed it into the institutional culture.
- Accountability and feedback mechanisms: Establish measurable goals and regularly monitor progress to demonstrate the impact of stakeholder contributions. Create feedback loops to gather input, address concerns, and adapt strategies based on stakeholder insights.

By incorporating these elements, HEIs can build strong, collaborative partnerships that drive meaningful and lasting sustainability outcomes.

In terms of the future, HEIs cannot and should not rely on past achievements in respect of engaging internal and external stakeholders. Rather, they need to adopt a culture of continuous improvement, regularly assessing and refining their sustainability initiatives. In this context, feedback from stakeholders is essential, to ensure that the efforts remain relevant and effective.

The limitations of this paper include its focus on three core themes—sustainability, stakeholders, and HEIs—resulting in a limited review of 215 documents, which may not capture the full breadth of relevant literature. Additionally, the case studies are based on a small sample of 29 universities, which, while exemplary, may not fully represent the diversity of HEIs worldwide, particularly those in less-resourced regions. The study also does not explore in-depth the specific challenges or barriers faced by universities in implementing stakeholder engagement practices, which could offer valuable insights for overcoming obstacles in real-world applications. Furthermore, the paper does not address the effectiveness of stakeholder engagement initiatives, an area that warrants further investigation.

Overall, this paper defends the view that stakeholder engagement is not just a beneficial practice but a fundamental requirement for driving sustainable development in higher education. By adopting a comprehensive approach that involves all stakeholders, HEIs can lead the way in creating a sustainable future. Our findings suggest that, while challenges exist, the potential benefits far outweigh the difficulties, making the pursuit of a greater engagement of all stakeholders in implementing sustainability in higher education both a noble and necessary endeavour.

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WLF conceived and coordinated the project, designed the methodology, amended the manuscript in several steps, and was a major contributor in writing the manuscript. TFACS contributed in the coordination of the project, amended the manuscript in several steps, and was a major contributor in the selection and analysis of the cases and in writing the manuscript. RA contributed in the coordination of the project, amended the manuscript in several steps, and was a major contributor in the selection and analysis of the cases and in writing the manuscript. BGR performed the analysis of trends and contributed to bibliometrics analysis, and contributed in writing the manuscript. ISR contributed to search, selection and definition of the sample for systematic review and analysis of cases, and contributed in writing the manuscript. SHB contributed to search, selection and definition of the sample for systematic review and analysis of cases, and contributed in writing the manuscript. DF contributed to develop the conceptual framework, analysis of cases, and in writing the manuscript. TT contributed to develop the conceptual framework, analysis of cases, and in writing the manuscript. LLB commented on and edited the first draft, and contributed in the interpretation of data. All authors read and approved the final manuscript .

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