Perception of Sustainable Development Goals in Universities from High-Ranking Databases

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Abstract

Research purpose:

The aim of this study is to provide a comprehensive overview of research trends on perceptions of the Sustainable Development Goals (SDGs) within higher education institutions.

Research motivation:

Higher education institutions are key drivers in the SDGs movement, developing strategies and research initiatives to implement these goals. Achieving the SDGs requires universities to prepare future citizens and professionals who are aware of and informed about sustainability issues. Hence, understanding sustainability awareness within universities is crucial for reflecting their integration and fostering sustainable development values.

Research design, approach, and method:

Publications from the Scopus and Web of Science databases were analyzed using a bibliometric approach to evaluate research progress and identify prominent research patterns regarding awareness of the SDGs in higher education. VOSviewer software was utilized to create and visualize scientific maps from bibliometric data, assessing relationships and connections among networks.

Main findings:

Using the bibliometric analysis, two main research streams regarding SDG awareness were identified across both Scopus and Web of Science databases: (1) Student perceptions, knowledge, attitudes, and behaviors towards sustainability and SDGs, and (2) Implementation of sustainability into curricula and higher education practices.

Practical/managerial implications:

The findings suggest a practical roadmap for universities seeking a sustainable model, from assessing the current state of awareness, attitudes, and knowledge regarding sustainability among all relevant groups to integrating the SDGs into university policies and curricula.

Keywords: Sustainable Development Goals (SDGs), Universities, Perception, Student Awareness, Bibliometric Analysis

1. INTRODUCTION

The United Nations released the 2030 Global Agenda, comprising 17 Sustainable Development Goals (SDGs), to which more than 193 countries worldwide, including Vietnam, are committed. However, to achieve those goals on schedule, not only the Government and relevant agencies, but also the entire population, especially the younger generation, need to be equipped with knowledge and awareness of sustainable development. In implementing sustainable development, universities play a pioneering role in researching, proposing, and applying sustainable policies and strategies within the education system. Accordingly, many global university ranking organizations have incorporated sustainable development criteria into their evaluation systems. Therefore, integrating the SDGs into universities' education has become a significant global trend.

Despite significant progress in research on sustainable development education, challenges remain in integrating it into higher education institutions. Ferguson and Roofe (2020) note that these challenges vary depending on the context of each country or university. As a result, universities adopt different approaches to implementing the Sustainable

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Development Goals (SDGs), highlighting the need for a comprehensive overview to identify the main trends in this area.

A preliminary review of the Scopus database reveals that the number of related articles has increased significantly in recent years. Before 2016, the number of publications was minimal; by 2024, it had jumped to over 400 articles. That jump illustrates the increasing interest of academics in sustainable development within higher education organizations. In Vietnam, research on the perception of universities regarding the SDGs remains limited to traditional topics. Therefore, we utilized the Scopus and Web of Science databases to explore emerging research topics and trends related to these crucial issues. The objective of this study is to provide a comprehensive of an overview of current research on perceptions of the Sustainable Development Goals (SDGs) across universities worldwide. Additionally, we propose suggestions for Vietnamese universities to promote research and curricula on the SDGs, ESG, and sustainable development.

2. LITERATURE REVIEW

2.1 Sustainable development and the Sustainable Development Goals (SDGs)

The notion of sustainable development was first introduced in 1987 through the Brundtland Report, titled "Our Common Future", which was released by the World Commission on Environment and Development. According to this report, sustainable development was defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland Commission, 1987).

Beyond the Brundtland Report, sustainable development has been approached from multiple perspectives. According to Kates et al. (2005), when the two terms “sustainable” and “development” are considered together, the concept can be interpreted as a linkage between what is to be sustained and what is to be developed for both the present and the future. This interpretation, advanced by the U.S. National Research Council in its 1999 report Our Common Journey: A Transition Toward Sustainability, emphasizes preserving and maintaining elements such as nature, life-support systems, and communities, while simultaneously advancing human development, the economy, and society over time, ranging from one generation (about 25 years) to an indefinite future (forever).

The World Summit on Sustainable Development in Johannesburg (2002) marked another significant milestone, which expanded the concept by formally recognizing its three interdependent pillars. The Johannesburg Declaration emphasized sustainable development as “a collective responsibility to advance and strengthen the interdependent and mutually reinforcing pillars of sustainable development – economic development, social development and environmental protection – at the local, national, regional and global levels” (United Nations, 2002).

In addition, some scholars have argued that sustainable development can be understood through multidimensional perspectives, including goals, indicators, and values (Kates et al., 2005). Nevertheless, the Brundtland definition remains the most widely accepted (Mensah, 2019; Schaefer & Crane, 2005), and it has served as the conceptual foundation of Sustainable Development Goals (SDGs) for the United Nations (UNESCO, 2015). Therefore, in the present study, sustainable development is also understood in line with the Brundtland Commission’s definition: “meeting the needs of the present without compromising the ability of future generations to meet their own needs”.

The Sustainable Development Goals (SDGs) consist of 17 goals proposed by the United Nations to promote peace and prosperity worldwide (United Nations, 2015). This global framework provides a roadmap for eradicating poverty, protecting the planet, and addressing inequality. The SDGs build upon and expand the Millennium Development Goals (MDGs, 2000–2015) (UNESCO, 2014).

Whereas the MDGs mainly addressed social objectives, such as eliminating extreme poverty, ensuring universal primary education, and enhancing maternal and child health, the SDGs encompass a broader perspective. They combine social, economic, and environment dimensions to form an integrated framework for sustainable development. The 2030 Agenda specifies 17 goals and 169 detailed targets, offering an ambitious and actionable plan to tackle the underlying causes of

conflict, human rights abuses, climate change, and environmental decline (United Nations, 2015).

Fig. 1. Sustainable Development Goals (Source: United Nations)

According to UNESCO (United Nations, 2015), the three core pillars of sustainable development are: environmental, social, and economic sustainability. These dimensions are closely interconnected and mutually reinforcing in building a sustainable future. Economic sustainability refers to fostering long-term economic growth while ensuring the ability of future generations to fulfill their needs (Mensah, 2019; Lobo & Appert, 2015). Doing so requires decision-making that accounts for environmental and social factors, rather than prioritizing short-term profit alone.
Social sustainability emphasizes human development, community well-being, and cultural vitality. It highlights equitable access to healthcare, education, gender equality, peace, and global stability (Mensah, 2019; Saith, 2006).
Environmental sustainability stems from the recognition that natural resources are being exploited at a pace exceeding their regeneration capacity, with climate change being the most pressing manifestation. Its core principle is to ensure that ecosystems and natural resources are preserved to support human life and long-term economic development (Mensah, 2019).

2.2 Education for Sustainable Development

Nowadays, higher education institutions play a key role in driving the SDG movement (Fauzi et al., 2023; Purcell et al., 2019; Hansen et al., 2021). According to Fauzi et al. (2023), universities are considered leaders in developing strategies, methods, and research initiatives to implement the SDGs and realize their intended outcomes. Since the adoption of the SDGs, many universities worldwide have integrated them into curricula, research agendas, and community engagement activities, thereby generating long-term social and environmental impacts (Mawonde & Togo, 2019).

Unlike most education movements, the inception of Education for Sustainable Development (ESD) was not initiated by the education community, but rather by international political and economic bodies such as the United Nations, OECD, and the OAS (Hopkins & McKeown, 2002). ESD emerged in the period following the 1992 Earth Summit in Rio de Janeiro, where education was recognized as a key enabler for achieving the Sustainable Development Goals. In many countries, the early framework of the concepts and content of ESD was initially shaped by ministries responsible for areas such as environment and health, before being handed over to educators to deliver (Hopkins & McKeown, 2002).

Today, ESD is recognized as a transformative strategy in modern education. As highlighted by UNESCO (2024), ESD positions education as a pivotal force for advancing all global development goals. It enables learners to acquire the necessary knowledge, competencies, and values to make informed choices and engage in responsible actions to drive social transformation and protect the planet. ESD promotes cognitive, socio-emotional, and behavioral learning. UNESCO further encourages governments, educators, and stakeholders to act across five priority areas: (1) advancing policy, (2) transforming learning environments, (3) building capacities of educators, (4) empowering and mobilizing youth, and (5) accelerating local-level actions. The overarching aim is to enable learners to grasp the complex interconnectedness between sustainability issues and to empower them to contribute to a future that is environmentally sound, economically viable, and socially just.

According to the United Nations (2015), achieving the SDG requires the active participation of “all countries, all stakeholders, and all people”. Within the higher education context, such participation implies mobilizing contributions from both individuals and institutions. As noted by Concina and Frate (2023), university programs must therefore address the objective of preparing future citizens and professionals who are aware of sustainability challenges. That goal involves not only embedding sustainable development themes into curricula and research, but also raising awareness among all

staff. Importantly, ESD emphasizes a transformative approach that goes beyond adding sustainability-related content to courses. It calls for pedagogical methods and learning strategies aligned with the core principles of sustainable development, contradicting the traditional transmissive approach (Sterling & Orr, 2001). Consequently, understanding sustainability awareness within universities is essential because it reflects the extent to which higher education institutions are integrating and fostering sustainable development values.

3. RESEARCH METHODOLOGY

We use desk research, an effective method for gathering information and insights from existing data and sources, instead of collecting primary data through fieldwork or surveys.We reviewed previous research and articles that focused on SDGs in higher education institutes and the awareness of universities on the topics. Then, we employed bibliometric analysis to identify research trends and notable points. Bibliometric analysis is used to evaluate the progression of research on universities' perceptions of the SDGs. Bibliometric analysis is a quantitative method that enables the assessment of existing literature growth while identifying prominent research patterns (Yadav et al., 2023). The method is particularly appropriate here because it provides a systematic and evidence-based approach to evaluating academic awareness about SDGs within higher education worldwide. Furthermore, bibliometric techniques provide a comprehensive view of research trends that narrative reviews alone cannot capture.

We employ the Scopus and Web of Science (WoS) databases, focusing on the outlined research theme. The search string applied is:

("SDGs" OR "ESG" OR "sustainability") AND ("universities" OR "higher education institutions" OR "HEIs") AND ("student" OR "teacher" OR "professor" OR "lecturer" OR "faculty" OR "academic staff") AND ("perception" OR "awareness" OR "view").

Relevant literature was identified through a thorough search of the Scopus and WoS databases using a targeted search string focused on the perception of university settings regarding sustainability. The initial set of results was subsequently filtered to include only articles within social sciences contexts and published in the English language. The list of papers was further refined by filtering based on indexed keywords. Only articles that included at least one of the following keywords were retained: Sustainable Development, Sustainability, Perception, Higher Education Institutions, Sustainable Development Goals, Awareness, Sustainable Development Goal, University Students, Environmental Awareness, SDGs, Sustainable Development Goals (SDGs), Student Perceptions, and Perceptions.

VOSviewer software was utilized to conduct the bibliometric analysis. The software can generate output in clusters, allowing researchers to assess the relationships and connections within bibliometric networks (Fauzi et al., 2023). A bibliometric visualization of the most frequently occurring keywords from the Scopus and Web of Science datasets was generated using VOSviewer. In the resulting network graph, the size of each node represents the frequency of occurrence of a given keyword. In contrast, the thickness of the links between nodes indicates the co-occurrence frequency of keyword pairs within the same documents. Node colors reflect clusters of related keywords, as identified by the software's clustering algorithm.

4. FINDINGS AND DISCUSSIONS

4.1 Scopus database

The bibliometric map provides a clear visualization of the predominant research themes related to perception in the context of sustainability. The existing literature primarily focuses on student perceptions, with limited attention given to the views of educators or administrative staff. Two major clusters emerge from the analysis: (1) student-centred sustainability in higher education (green), (2) sustainable development and engineering education (red).

The student-centered cluster is characterized by four key terms: sustainability, student, perception, and higher education. Similarly, the red cluster is defined by the keywords: teaching, engineering education, sustainable development, and students. Questionnaires are used widely in sustainability education research to assess university students' awareness (both clusters have keywords related to "survey"), perceptions, attitudes, behaviors, and knowledge of the Sustainable Development Goals (SDGs). Utilizing various formats, such as Likert scales, multiple-choice questions, and open-ended questions, they enable both quantitative and qualitative analysis. Typical applications include evaluating self-reported knowledge, behavioral intentions, educational interventions, group comparisons, and learning progress over time. The results also support the validation of research instruments through statistical methods to ensure reliability and accuracy. Institutional leadership, student perceptions, and ethical considerations play critical roles in shaping the responsible and sustainable integration of AI, aligning with broader goals such as SDG 4 (Quality Education) and SDG 9 (Industry, Innovation, and Infrastructure).

The frameworks used across these studies offer valuable insights into students' perceptions, behaviors, and agency related

to sustainability and corporate social responsibility. By incorporating comparative, multidimensional, and mixed-method approaches, they enable a deeper understanding of how cultural, institutional, and personal factors shape student engagement. The frameworks also support curriculum development, validate research instruments, and promote reflective and transformative learning, ultimately guiding universities in effectively embedding sustainability into their teaching and practices.

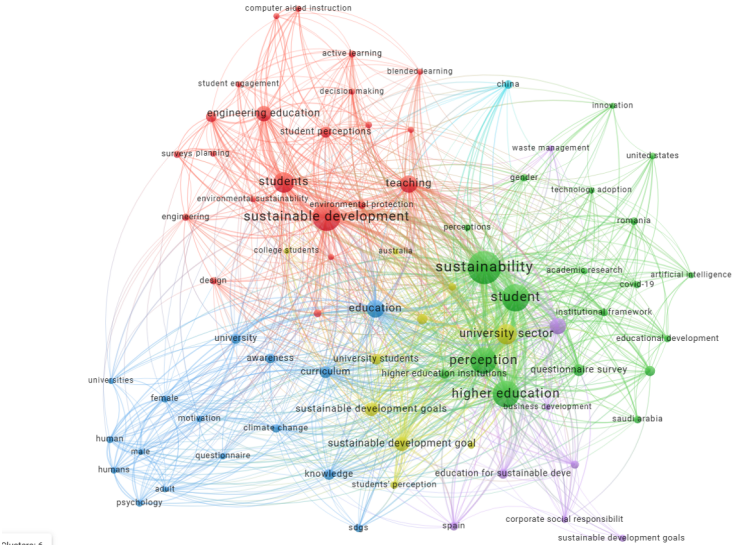

Fig. 2. The result of the bibliometric analysis for the Scopus database

4.1.1 Student-centered sustainability in higher education

The research in this cluster primarily focuses on students' perceptions of coursework and their participation in university sustainability initiatives. Cebrián and Junyen (2015) employed a questionnaire-based research design to investigate the perspectives of 32 student-teachers regarding education for sustainable development (ESD) competencies. The data collected focused on which competencies these future educators would prioritize when designing a school project centered on ESD principles. The study addresses a research gap by focusing on student teachers' perceptions of ESD, revealing a tendency to prioritize scientific knowledge over ethical, emotional, and attitudinal aspects. It highlights the need to integrate ESD frameworks more effectively into teacher education to foster more holistic competency development (Cebrián & Junyen, 2015).

Other studies used a two-part approach: (1) a review of sustainability initiatives at universities in Alabama and Hawaii, and (2) a survey of 406 undergraduate students (258 in Alabama, 148 in Hawaii) to assess their concerns, knowledge, and views on responsibility for sustainability. For example, one study adds to the literature by highlighting regional differences in student engagement with sustainability and emphasizing the importance of understanding perceptions to foster sustainable practices in higher education (Emanuel & Adams, 2011).

In another study, Fisher & McAdams (2015) examine how the type and amount of coursework influences students' conceptual understanding of sustainability. Survey data from 552 students at a southeastern U.S. university were analyzed using four linear regression models across four dimensions: ecosystems and nature, eco-efficiency, community and well-being, and systemic change and innovation. The research reveals that the type of course, rather than the number of courses, significantly shapes students' views, with perspectives often reflecting the focus of their academic division, highlighting the need for more integrated curricula to promote holistic understandings of sustainability (Fisher & McAdams, 2015).

Tuncer (2008) surveyed 823 students at Middle East Technical University to examine perceptions of sustainable development and lifestyle changes. Using a modified Environmental Attitude Scale and two-way ANOVA, results showed significant gender differences but no effect of enrolling in environment-related courses. The findings underscore the need for a more robust integration of sustainability education in universities.

Almutairi et al. (2020) examined sustainability awareness and behaviors among 500 students from seven universities in

Saudi Arabia's Eastern Province. Using a questionnaire-based approach, the researchers found that although most students had heard the term "sustainability" through educational sources, their actual knowledge was limited, particularly regarding recycling, renewable materials, and energy use. Few students reported engaging in recycling, though many participated in other conservation-related practices. The study concludes that universities and other stakeholders, including governments and municipalities, should implement mandatory courses and campus initiatives to strengthen sustainability literacy and foster sustainable behaviors.

4.1.2 Sustainable development and engineering education

Cabedo et al. (2018) investigated the impact of Service-Learning (SL) and Project-Based Learning (PBL) on sustainability competencies among 100 second-year industrial design engineering students in Spain. Participants were divided into two groups, one experiencing SL and the other PBL, and their outcomes were measured using a 28-item questionnaire. Results showed that PBL was more effective in developing University Social Responsibility (USR) competencies, emphasizing the value of project-based approaches for embedding sustainability into engineering education (Cabedo et al., 2018).

Another study analyzed how sustainability concepts were embedded across three engineering programs at the University of the Basque Country (UPV/EHU). Using a newly validated questionnaire, the study examined students' perceptions of the environmental, social, and economic aspects of sustainability. Findings revealed low curricular integration despite students attaching strong importance to sustainability in academic, professional, and personal contexts, indicating the need for more comprehensive curriculum reforms (Aginako & Guraya, 2021).

Research on senior engineering projects explored how sustainability awareness could be strengthened through structured curricular frameworks. Surveys identified barriers to the application of sustainability tools, informing the development of a two-path framework that combines curriculum design modifications with systematic assessment of learning outcomes. The study highlighted the necessity of restructuring capstone courses to ensure sustainability competencies are effectively embedded (Abd-Elwahed & Al-Bahi, 2021).

A further contribution presented an innovative scheme designed to teach photovoltaic (PV) systems to first-year engineering students in South Africa. Students engaged in hands-on experiments using ARDUINO UNO and LabVIEW, which they reported as engaging, relevant, and applicable to real-world contexts. The findings demonstrate that practical teaching tools can enhance awareness of renewable energy technologies at the entry level of engineering education (Hertzog & Swart, 2015).

Finally, a study in India examined engineering students' familiarity with the circular economy (CE) through a two-phase survey of 148 participants. Results showed that only a third of students were initially aware of CE; however, after exposure, they identified barriers to its curricular integration, such as limited institutional emphasis and a lack of prior knowledge. The study underscores the importance of embedding CE principles into engineering curricula to align education with sustainability objectives (Venugopal & Kour, 2021).

4.2 Web of Science database

Regarding the co-occurrence of keywords from the Web of Science database, the visualization provides a comprehensive overview of the research landscape related to SDG awareness in the university context. Individual keywords are represented as nodes, with their size indicating the frequency of occurrence. Unsurprisingly, the dominant node is "sustainable development goals", which is closely connected to other keywords such as "higher education", "education", "university", "awareness", and "sustainability", thereby emphasizing the central research focus. The network comprises 30 keywords, organized into four clusters. The red cluster, together with the yellow one, reflects a coherent theme: while the yellow cluster emphasizes frameworks, key competences, and conceptual foundations for embedding sustainability, the red cluster highlights the implementation of these ideas into curricula and teaching practices. Thereby, these two clusters jointly represent a theme related to the frameworks and integration of sustainability in universities. The green and blue clusters are closely interconnected, both capturing research on perception, knowledge, and attitudes toward SDGs and broader sustainability issues.

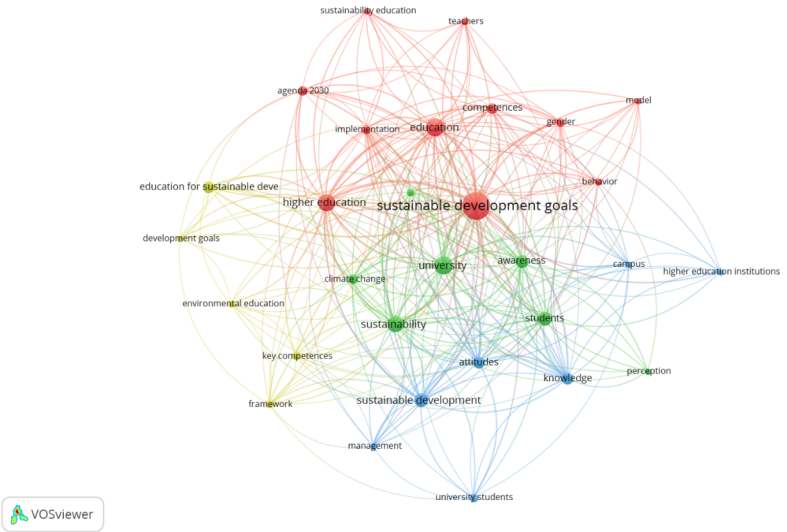

Fig. 3. The result of the bibliometric analysis for the Web of Science database

4.2.1 Frameworks and implementation of sustainability in higher education

The first identified theme focuses on integrating the SDGs into universities' models and academic structures to foster engagement and raise students' awareness. This theme combines the yellow and red clusters, with keywords such as: sustainable development goals, higher education, sustainability education, education for sustainable development, implementation, framework, model, competences, key competences, behavior.

Sustainability implementation can take various forms, with policy being a prominent example. Younis and Mamdouth (2021) highlighted the necessity of formulating sustainable development policies and attempted to establish one aimed at improving solid waste management. They applied sustainable supply chain management principles to manage university waste, treating it as a product resource that requires management across the chain to maximize efficiency and protect the environment.

Another study by Gbagbo and Nkrumah (2022) examined gender-related policies under SDGs 3 and 5, with a particular focus on breastfeeding. Through surveys conducted at universities in Ghana, three main themes were identified: breastfeeding policy and programs, institutional support, and views on breastfeeding/ childcare support (Gbagbo & Nkrumah, 2022). Despite the importance of this issue, none of the universities had a formal policy for breastfeeding or childcare, nor were there immediate plans for on-campus facilities. The study nonetheless offers valuable insights for policymakers, shedding light on a persistent gap in gender and child-friendly policies within higher education.

A second approach to this theme involves designing teaching methodologies and frameworks to strengthen SDG concepts through effective teaching and learning. Martín-Sánchez et al. (2022) emphasized the importance of incorporating sustainability-oriented teaching methodologies that engage students and foster meaningful learning experiences. Their study details the design, implementation, and assessment of a Service Learning approach as an ESD strategy within a university course. The findings demonstrate how that methodology effectively combines the achievement of curricular competences with the development of environmental awareness, making it a highly suitable strategy for ESD.

Another framework proposed by Zamora-Polo and Sánchez-Martín (2019) consists of five components to teach SDG at the university level, placing students at the center of the teaching-learning process. According to the authors, universities should focus not only on content development but also on students' real needs, interests, and backgrounds. Such an approach enables the personalization of SDG education for diverse student groups.

A third approach is to embed the SDGs into curricula and academic courses to promote sustainable competencies among students. Universities are seen as strategic agents in the transformation process towards sustainability and should therefore commit to cultivating such skills through sustainable curricula (Miguel et al., 2020).

Alternatively, El-Kholei et al. (2024) explored the adoption of sustainable design principles by integrating SDGs into

architectural education through students' graduation projects. These projects significantly enhanced students' comprehension of sustainable urban development and provided valuable lessons for both pedagogy and practice.

4.2.2 Perception, knowledge, and attitudes toward SDGs in higher education institutions

The second theme comprises studies that investigate attitudes, perceptions, and behaviors towards sustainable development, both in general and in relation to specific issues. It encompasses keywords from the green and blue clusters, including sustainable development, university students, awareness, attitudes, perception, knowledge, sustainability, climate change, and consumption. A vast majority of studies on this second theme have assessed students' perceptions and awareness of sustainable development. Other investigations, though, have examined more specific issues, such as climate change or consumption.

In any event, universities have increasingly demonstrated a commitment to embedding sustainability within their curricula and academic programs (Alm et al., 2022). Such initiatives aim to enhance students' understanding of environmental issues, improve their sustainability literacy, and foster critical thinking. However, the extent to which these practices yield positive results remains uncertain. Consequently, many studies have addressed this research question. Alm et al. (2022) sought deeper insights into students' awareness and comprehension of how the SDGs are used in higher education institutions to encourage sustainability learning. An online survey was conducted to explore students' perceptions of the integration of sustainability topics into their courses and programs. The findings indicated that incorporating SDGs into teaching not only frames students' key competencies but also helps develop their interpersonal skills as future sustainability ambassadors (Alm et al., 2022).

Another study by Jillani et al. (2022) investigates sustainability awareness among university students in Pakistan, highlighting the roles of both the public and private institutions. The findings indicate that private universities are at the forefront of sustainability education, whereas public ones lag behind. Hence, both sectors are encouraged to contribute by embedding sustainability into curricula and adjusting the policy frameworks to advance this global goal.

Other papers likewise explored students' knowledge and perception on sustainable development and the ESD concept (Ariffin et al., 2019; Bezeljak et al., 2020), with findings that offer valuable insights for curriculum evaluation and development.

Climate change, environmental problems, and consumption issues are also important areas of inquiry. Demaidi and Al-Sahili (2021) examined students' knowledge and daily behaviour regarding climate change, highlighting the key role universities and students' societies play in promoting and reinforcing awareness. The study revealed gender-based differences in awareness and recommended that universities integrate climate change topics into study programs (Demaidi & Al-Sahili, 2021).

In line with the theme of consumption, Filho et al. (2023) addressed the growing issue of food waste in higher education institutions. Their qualitative analysis identified four actions universities can adopt to reduce food waste, including planning and awareness, food preparation and storage, services processes, and waste reuse.

5. CONCLUSIONS AND SUGGESTIONS

Research findings indicate several similarities in the primary research streams between the Scopus and Web of Science databases. The first key research stream focuses on student perceptions, knowledge, attitudes, and behaviors regarding sustainability and the Sustainable Development Goals (SDGs). In the Scopus database, the cluster "Student-centered sustainability in higher education" directly explores students' perceptions, knowledge, attitudes, behaviors, and engagement in university sustainability initiatives. This cluster examines how coursework and programs shape students' understanding of sustainability. In the Web of Science database, the theme "Perception, Knowledge, and Attitudes Toward SDGs in Higher Education" explores attitudes, perceptions, and behaviors related to sustainable development. It also addresses specific challenges within this context. The studies conducted under this theme aim to enhance understanding of students' awareness and knowledge regarding the application of the Sustainable Development Goals (SDGs) to encourage sustainable learning.

The second one emphasizes integrating sustainability or SDGs into curricula and higher education practices. The "Sustainable development and engineering education" cluster from the Scopus database focuses on integrating sustainable development into engineering education, curriculum reform, and course restructuring to ensure that sustainability competencies are effectively incorporated. In comparison, the "Frameworks and implementation of sustainability in higher education" theme in Web of Science explicitly addresses integrating the SDGs into universities' academic models and structures, as well as the design of methodologies and frameworks to strengthen this concept through teaching and learning. It also emphasizes embedding SDGs into curricula and academic courses to promote sustainable competencies, positioning universities as strategic agents in the integration process.

These findings indicate a consistency in research themes related to perceptions of SDGs in higher education. In summary,

two significant themes identified across both datasets are:

(1) Student perceptions, knowledge, attitudes, and behaviors towards sustainability and SDGs
(2) Implementing sustainability into curricula and higher education practices

Notably, both databases indicate that universities play a significant role in promoting and integrating sustainability. Scopus showcases research on university initiatives, courses, and engineering education that addresses sustainability, highlighting the importance of universities in implementing mandatory courses and campus initiatives to strengthen sustainability literacy. Similarly, analysis of the database from Web of Science reveals that universities are strategic agents transforming to sustainability, and that they should commit to cultivating the necessary skills through sustainable curricula.

In the context of Vietnam, however, the integration of SDGs into strategic planning remains limited. According to Le and Nguyen (2023), although many institutions have started incorporating sustainability-related content into management, teaching, and research activities, systematic adoption is still in its early stages. Several universities have taken notable steps by developing SDG-oriented curricula, promoting sustainability research, and implementing green campus practices such as carbon reduction, recycling, and renewable energy use. Ton Duc Thang University, for example, has consistently ranked highly in the UI Green Metric due to its sustainable campus management. Similarly, universities such as Ho Chi Minh City University of Technology and Education, Nha Trang University, and Lac Hong University have organized international conferences on green technology and sustainable development. However, a Google-based survey in 2022 performed by Le and Nguyen (2023) found that only about 20 of 240 Vietnamese universities had public information on the SDGs on their official websites, suggesting that most institutions have not yet fully embedded the SDGs into their strategic objectives.

Nguyen (2025) further notes that the implementation of SDGs in Vietnamese universities can also be observed through their participation in the Times Higher Education (THE) Impact Rankings. The number of Vietnamese universities included in these rankings increased from one in 2019 to 13 in 2024, indicating growing attention to sustainability performance. Most of these institutions are ranked for SDG 17 (Partnerships for the Goals) and tend to focus on goals related to education, health, equality, and community well-being (SDGs 4, 8, 10, 11, and 16). In contrast, environmental and resource-related SDGs receive less attention.

To move beyond symbolic engagement with the SDGs, universities in Vietnam should strengthen institutional awareness by evaluating perceptions, attitudes, and knowledge among relevant groups (students, lecturers, managers, and others) regarding sustainability and the SDGs, and their capacity to implement sustainable development. A clear understanding of the role of higher education in promoting sustainable development, along with a thorough assessment of the institutions' strengths and weaknesses, is essential for developing appropriate strategies and policies (Le & Nguyen, 2023). It is important to integrate the Sustainable Development Goals (SDGs) into university policies and curricula. The curriculum should not only impart knowledge but also cultivate sustainable skills and competencies. By adopting this approach, institutions can effectively contribute to SDG 4 and educate global citizens who are prepared to tackle future sustainability challenges.

Among the frameworks proposed for embedding SDGs in higher education, the model developed by the Sustainable Development Solutions Network (SDSN, 2017) is among the most widely referenced (Zanellato & Tiron-Tudor, 2021; Leal et al., 2021; Griebeler et al., 2022; Albareda-Tiana et al., 2018; Leal Filho et al., 2019; Alcántara-Rubio et al., 2022). The framework also provides a reference roadmap for universities to become an SDG-oriented university with five main steps (i) Map out what the university has done and is doing in relation to the SDGs; (ii) Build capacity and promote ownership of the SDGs across the entire university; (iii) Identify priorities, opportunities, and gaps for improvement; (iv) implement, and embed the SDGs into all activities of the university; (v) Monitor, evaluate, and communicate the results achieved.

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