

University Sustainability: A Roadmap for Sustainable Development with Insights from International Models

Durabilité universitaire une feuille de route pour le développement durable avec des perspectives des modèles internationaux

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Abstract:

This study examined how universities integrate sustainability principles into their systems. The analysis shows that sustainability, essential for addressing global challenges, requires increased awareness, solid knowledge, and values championed by universities, serving as a roadmap for building a healthy and sustainable society.

Keywords: *The university; sustainability; Sustainable university; Higher Education Sustainability; Sustainable development.*

Jel Classification Codes: I23, Q56.

Résumé :

Cette étude a examiné comment les universités intègrent les principes de durabilité dans leurs systèmes. L'analyse montre que la durabilité, essentielle pour relever les défis mondiaux, exige une sensibilisation accrue, des connaissances solides et des valeurs portées par l'université, servant de feuille de route pour bâtir une société saine et durable.

Mots clés : *L'université ; Durabilité ; Université durable ; Enseignement supérieur durable ; Développement durable.*

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1. INTRODUCTION

Universities stand at the pinnacle of educational institutions, driving intellectual, cultural, and scientific standards in the information age. They function as knowledge hubs that drive social development and environmental enhancement, directly linking societal progress to their outcomes. Despite various developmental challenges, universities have consistently generated viable solutions to address these issues. Distinguished faculty and researchers facilitate their complex and multifaceted contributions to labor market integration. These experts produce scholarly publications through rigorous investigation, present at academic conferences, and pioneer innovative specializations. Such advancements enrich existing academic disciplines and address labour market demands sector by sector, fostering the integration of sustainable development principles among diverse stakeholders, including the institutions themselves.

Against this backdrop, the research question arises: **To what extent do universities contribute to achieving sustainable development goals?**

1.1 Importance of the study

The significance of this research lies in its exploration of the pivotal role universities play in sustainable development. This study examines their capacity to develop talent, generates innovative projects, and produces academic research. By analyzing developmental challenges through scientific frameworks, the research aims to illuminate systemic issues and provide strategic solutions that address the needs of future generations.

1.2 Objectives of the study

This investigation pursues three primary objectives: to analyze the evolving role of universities in advancing sustainable development practices and principles; to identify and evaluate critical success factors and barriers to implementing university sustainability initiatives through examination of international experiences; and to develop a comprehensive framework for effectively implementing sustainability practices within university systems.

2. Sustainability in Higher Education Institutions

2.1. Historical Development of Sustainability Integration in Universities

From 2005 onwards, sustainability became a significant part of university policies, emerging as the dominant institutional framework by 2008. As noted by Adombent and Beringer cited in (Al-'Umarī, 2019, p. 6), the integration of sustainability into universities has evolved through three fundamental phases:

Phase One: Campus Preparation

The initial phase focused on preparing the campus through targeted modifications of key university processes. Initiatives in this stage included curricular enhancements incorporating sustainability principles and the introduction of postgraduation sustainability pledges. These pledges encouraged graduates to assess the social and environmental impacts in their professional roles while seeking improvements in these areas within their organizations. A distinctive feature of this phase is its strong emphasis on engaging students in sustainability efforts.

Phase Two: Systematic Scientific Investigation

The second phase was advanced by implementing university-wide development initiatives based on rigorous scientific methods. These comprehensive programs evolved significantly from the first phase, as they applied systematic methodological transformations and theoretical frameworks. Notable examples include Harvard University's Green Campus Initiative and the University of New Hampshire's CORE (Curriculum, Operations, Research, and Engagement) Initiative. These initiatives showcase integrated strategic approaches to institutional sustainability. Although they represented systematic transformations of campus practices, they mainly served as experimental scientific enquiries within research and development contexts, rather than fully established sustainable university projects.

Phase Three: Transformative Sustainability

In the third phase, universities engaged in comprehensive research and development projects focused on sustainable practices, often funded by

external sources. These projects aim to advance institutional sustainability and contribute to a broader scientific understanding of the field. This phase is marked by robust theoretical frameworks, systematic research designs, rigorous methodologies, extensive empirical data collection, and structured evaluation protocols. The resulting scholarly work has contributed to the growing field of transformative sustainability science.

2.2. A Vision for University Sustainability

The implementation of university sustainability follows a structured process (Muqayti', 2017/2018, pp. 114-116):

Developing a Sustainable University Vision: The strategic journey towards sustainability begins when individual stakeholders envision a sustainable university model. In this model, institutional members integrate sustainable development principles, deploying all available resources to fulfil the university's mission using sustainable methods. Institutions must articulate their sustainability paradigm during this phase and establish a fundamental rationale for sustainable operations. Since stakeholders may interpret sustainability differently, each institution should formulate its unique definition of a "sustainable university."

The Mission Implementation Process: The mission development process adds practical elements and motivating forces. A mission statement is more concrete than a vision, providing a foundation for actionable initiatives and underlying philosophy. By integrating epistemological and political philosophical frameworks, universities establish institutional legitimacy. Stakeholders focused on sustainability to modify or develop the university's mission so that sustainability becomes a core institutional value.

Sustainability Committee: Sustainability initiatives have been implemented in various departments to achieve the set goals. Without comprehensive institutional policies, leaders must create independent policy frameworks and objectives. Establishing a sustainability steering committee helps to develop cohesive institutional policies and strategic objectives. This committee operates at the highest level of decision-making, supporting rather than directing initiative leaders. It prevents duplicate efforts, facilitates resource allocation, and ensures effective policy implementation.

Effective sustainability policies must be designed to drive behavioural change within the university community, avoiding fragmentary implementation, operational instability, and a lack of measurable outcomes.

Strengthening Collaborative Initiatives: Many sustainability initiatives start within external organizational networks, where key stakeholders advocate for integrating sustainability into higher education. These networks coordinate implementation strategies, share information systematically, and raise sustainability awareness across university communities. A robust institutional sustainability framework requires mechanisms for monitoring, analysing, and evaluating the performance of these initiatives to ensure comprehensive implementation.

2.3. Drivers and Principles of the Sustainable University

2.3.1. Drivers for Adopting the Sustainable University Model

Several factors influence higher education institutions' commitment to a sustainable university model (Ya'qūb & 'Abbās, 2019, p. 11):

Organizational: Universities' significant resource consumption and environmental impact creates responsibility to minimize adverse societal effects.

Knowledge-Based: As centers of scientific knowledge, universities are uniquely positioned to address sustainability challenges through dynamic knowledge production.

Legal-Regulatory: Global sustainable development legislation requires institutional compliance with new environmental regulations.

Social Responsibility: Universities must adopt modern sustainability practices and educate graduates with relevant skills and awareness.

Effectiveness: Sustainability in academic programs ensures graduates meet labor market demands, strengthened by university-business-community partnerships.

Community Support: Sustainability-focused institutions receive strong backing from governments, businesses, media, and community stakeholders.

2.3.2. Principles of University Sustainability

University sustainability education is guided by six fundamental principles (Beringer & Adomßent, 2008, p. 618):

Transformational Change: Beyond information sharing, focuses on developing competencies for managing sustainability transitions across organizational and community contexts.

Inclusive Lifelong Learning: Encompasses comprehensive education across demographics in formal and informal settings, from academic institutions to community spaces.

Systems Thinking: Cultivates understanding of interdependencies between environmental, economic, social, and political systems.

Future Vision Development: Engages stakeholders in creating collective sustainable future visions through collaborative planning.

Critical Reflection: Develops capacity for critical analysis by integrating personal experiences with global perspectives.

Participatory Engagement: Prioritizes diverse stakeholder inclusion in sustainability initiatives to ensure multiple voices shape the process.

2.4. Requirements for University Administrations' Transition Towards Sustainability

The transition toward sustainability in universities requires comprehensive, integrated, and multidisciplinary approaches. University administrations must fundamentally transform across multiple dimensions (Besong & Holland, 2015, p. 38):

At the Institutional and Organizational Level: A sustainable university operates effectively on both institutional and organizational fronts. The entire institution—its structures, processes, and people—must undergo systematic transformation. Effective leadership, coupled with faculty members who fully understand the university's role as a system geared toward sustainability, is essential to driving change across all dimensions.

At the Institutional Culture Level: Embedding sustainability in universities requires extensive cultural changes that affect administrative decisions, procedures, curricula, and research. Universities that have successfully implemented comprehensive sustainability are characterized by: leadership with a vision and commitment to sustainability enhancement; focus on UNESCO-endorsed teaching methods for sustainability transition; research oriented toward practical sustainability solutions; awareness of the

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university's environmental footprint and implementation of sustainability policies; and community engagement that promotes environmental sustainability awareness in society.

At the Operational Activities and Processes Level: Successful sustainability transformation integrates operational activities with academic research and actively involves students. It also requires establishing strong connections between operational activities and sustainability's social, economic, environmental, cultural, and political dimensions to ensure holistic integration.

At the University Policies Level: Institutionalising sustainability means developing a dedicated policy framework that guides campus-wide initiatives. This framework should complement strategic plans and assessment reports, establish core sustainability values within the institution, and promote cohesion and integrated practices among the university staff.

At the Plans and Strategies Level: At the Plans and Strategies Level: For universities to comprehensively transition toward sustainability, they must develop specific plans, strategies, and methodologies. This transformation should encompass all aspects of university life and orient them toward sustainability and its issues, including education (curricula and teaching methods), scientific research (faculty and student research), and internal operations such as: converting buildings into sustainable facilities, applying sustainability standards and requirements to procurement, maintenance, human resources, and student management. Additionally, this includes community awareness through engaging the local community in sustainability issues and raising awareness about their importance.

At the Educational Leaders Level: The lack of attention to sustainable leadership weakens educational institutions' ability to ensure future teaching quality. Essential practices in sustainable educational leadership include acknowledging the need for succession planning and providing adequate development opportunities for prospective future leaders.

Sustainable leadership is fundamental to university continuity, enabling the institution to pursue its goals and maintain student and faculty

achievements while continuously planning for the future. Additionally, sustainable leadership means current leaders can transfer their skills, experience, and ideas to future leaders, ensuring the university's continued growth and prosperity.

2.5. Challenges in University Sustainability Implementation

According to Bohn et al. as cited in (Al-Khawāldah, 2012, p. 26) universities face multiple challenges in implementing sustainability. The primary barriers include limited institutional awareness and participation, staff resistance to change, and insufficient funding for sustainability initiatives. Traditional university structures and bureaucratic systems, coupled with weak interdisciplinary research participation, impede progress. Faculty often prioritize personal advancement over research impact, while demonstrating limited understanding of sustainable practices. Universities view sustainability as a financial burden, particularly challenging given the required short and long-term resource commitments. Additional obstacles include unclear sustainability objectives, misalignment between institutional goals and employee performance, and difficulty adapting to changes at local, regional, and global levels.

3. Sustainable Development

3.1. Definition and Characteristics of Sustainable Development

3.1.1. Definition of Sustainable Development

Sustainable development was formally introduced through the Brundtland Commission's 1987 report "Our Common Future," defining it as development that equally balances current and future generations' developmental and environmental needs (Būdarjah, 2017, p. 605). The National Charter for Environment and Sustainable Development expanded this, describing it as essential to prevent environmental degradation, natural imbalances, health problems, poverty, and declining quality of life, while emphasizing improved living conditions for all within a framework of social justice (ben Hāj & Maghrāwah, 2017, p. 154). Classical economic theory views sustainability as the continuous maximization of economic welfare, measured through income and consumption indicators reflecting human well-being (Kāfī & Hammāsh, 2018, pp. 601-602). The concept fundamentally incorporates environmental preservation through rational

resource use within Earth's capacity, with investments in resources like renewable energy driving economic growth, while ensuring both present prosperity and future needs are met despite potential obstacles.

3.1.2. Characteristics of Sustainable

sustainable development is characterized by several key features. It is fundamentally time-oriented, focusing on long-term planning based on present capabilities and the longest possible future projections. It considers future natural resource needs within Earth's biosphere, while prioritizing human needs including food, clothing, education, healthcare, and overall material and social well-being. This development approach emphasizes preserving the natural biosphere, including its basic elements, compounds, and vital processes such as atmospheric gases, while preventing the depletion of vital energy resources. It also requires an integrated approach that harmonizes resource limitations, investment trends, and technological choices to maintain environmental systems and achieve continuous development, as exemplified by organizations' implementation of green marketing philosophies (Būsāḥah & Baḥūṣ, 2019, p. 73).

3.2. Sustainable Development Objectives

Sustainable development encompasses a range of objectives derived from its operational mechanisms and foundational principles (Ghunaym & Abū Zant, 2007, pp. 19-20). These objectives can be broadly categorized into the following key areas:

Environmental Stewardship: Sustainable development is based on the intrinsic relationship between human activity and ecological systems. It acknowledges that natural ecosystems are fundamental to human existence and emphasises the interdependence of natural and built environments. The goal is to foster harmonious integration of these environments to support a long-term ecological balance.

Quality of Life Enhancement: This approach prioritises improving societal welfare through careful planning and policy implementation that addresses economic and social dimensions. Instead of focusing solely on quantitative growth, sustainable development emphasizes qualitative progress, ensuring that improvements in human well-being are both equitable and enduring.

Environmental Consciousness and Social Engagement: Developing individual environmental stewardship is crucial. This objective calls for the active participation of community members in sustainable development initiatives, including planning, implementation, monitoring, and evaluation. Engaged and informed citizens can drive meaningful changes and support sustainable practices.

Resource Conservation and Management: Sustainable development treats natural resources as finite capital. It emphasises the conservation of these resources while seeking to optimize their use. The aim is to prevent depletion by efficiently managing resources, ensuring that future generations can meet their needs without compromising the planet's health.

Technological Integration for Community Development: This objective involves educating communities about the role of technology in development and guiding them to adopt both established and emerging technologies. By doing so, communities can enhance their welfare and work towards achieving predetermined development goals by leveraging technology for sustainable progress.

Community Priority Evolution and Adaptation: Sustainable development strategies are tailored to community capacities, balancing economic growth with environmental challenges. This approach requires evolving and adapting priorities as the community needs change, ensuring that solutions remain effective in addressing current and future challenges.

3.3. Key Elements of Sustainable Development

The implementation of sustainable development involves several fundamental elements (Ya'qūb & 'Abbās, 2019, pp. 7-8). Three of these elements are particularly significant:

Environmental Justice: Environmental justice is paramount in sustainable development frameworks, especially intergenerational equity. It mandates that current resource utilisation must not compromise the ability of future generations to meet their own needs. This principle aims to balance present consumption and production patterns, ensuring that the needs of future populations are not disadvantaged.

Environmental Effectiveness: Environmental effectiveness focuses on reducing waste, optimising energy consumption, and utilising natural

resources more efficiently to minimise negative impacts on the atmosphere. By reducing waste in production processes and achieving the targeted output levels, this element seeks to lower the environmental footprint. The relationship between natural resource inputs and waste emission outputs directly indicates the environmental impact. Therefore, environmental effectiveness aims to generate greater value with reduced environmental consequences, embodying the core principle of sustainable development.

Environmental Efficiency: Environmental efficiency involves protecting natural resources from exploitation and ensuring their use is not wasteful. According to the Solovian-Kuznets principle of sustainable development, returns from depleted resources should partially address current needs while allocating the remainder to future projects. This approach ensures that the benefits gained from resource use are not short-lived but contribute to the long-term sustainability and well-being of future generations.

3.4. Dimensions of Sustainable Development

Sustainable development encompasses three fundamental dimensions that transcend environmental considerations by integrating economic development, social progress, and environmental protection. This interrelationship can be succinctly expressed through the following framework:

$$\text{Sustainable Development} = \text{Economic Growth} + \text{Social Development} \\ \text{and Equity} + \text{Environmental Conservation}$$

Economic Development: addressing economic underdevelopment requires several key strategies. These include optimizing water resource management across agricultural, industrial, urban, and rural sectors, while increasing economic efficiency and formal sector employment opportunities. Agricultural output must be enhanced to ensure adequate food quantity and quality, alongside implementing preventive healthcare and workplace safety measures. The approach also emphasizes equitable wealth distribution to reduce poverty and unemployment, while building a service-oriented market economy based on information technology (Nāṣir, 2010, p. 8).

Social Development: Social development ensures an individual's right to live in a clean, healthy environment where they can conduct activities and receive a fair share of natural resources to meet their basic needs. key social development objectives include respecting individual rights and enabling participation in decision-making, implementing human health protection standards with priority healthcare access for the poor, ensuring access to appropriate housing at reasonable prices, and meeting basic individual needs primarily through employment opportunities, education, and healthcare services (Al-Sinbānī, 2016, p. 142).

Environmental Development: Environmental development aims to preserve global environmental heritage and natural resources for future generations. this includes protecting watersheds, groundwater, and freshwater systems; rationalizing the use of natural resources through state regulation to prevent uncontrolled depletion; ensuring sustainable use and conservation of land, forests, water, wildlife, and related resources; and protecting nature and ecosystems for future generations through adoption of renewable energy resources (ben Ḥalīmāh & Khadrāwī, 2016, p. 122).

4. Leading International Practices in Sustainable University Education

4.1. Newcastle University, United Kingdom

Newcastle University was formally established in 1963, evolving from the original School of Medicine and Surgery founded in 1834 in Newcastle upon Tyne, northeastern England. Today, the institution serves approximately 27,750 students and employs 5,780 academic staff. It ranks among the top 1% of global institutions and achieved the 11th position in the 2020 Times Higher Education Impact Rankings for sustainable development goals. Furthermore, it achieved 10th place in the 2016 UI Green Metric Rankings and 19th in the 2017 rankings. The university administration has implemented several significant sustainability initiatives (Mujāhid, 2017, p. 65), with particular emphasis on the following areas:

Sustainability Strategy Development: The university formed the Environment and Sustainability Committee to design and develop a sustainability strategy. Through multiple interviews with environmental coordinators, they developed the 2008 Sustainability Strategy. The

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strategy's implementation involved education faculty members working in collaboration with the university's energy and waste management directors.

Energy Management: The university became an active member of the Higher Education Carbon Management Plan to develop strategies for productive projects' emissions reduction, enhance CO₂ monitoring systems across campus, and integrate carbon management into sustainability strategy.

Waste Management: Newcastle University implemented campus-wide indoor and outdoor recycling bins for newspapers, plastic bottles, and toys. The system converts restaurant and office waste into compost, while replacing plastic bins with laminated cardboard containers to reduce environmental impact.

Transportation: In 2006, the university partnered with Newcastle City Council and North Umbria University to implement a discounted public transport scheme for faculty, students, and staff. This initiative successfully reduced campus car travel, enhanced sustainable transport options, minimized necessary traffic impact, and reduced emissions.

Biodiversity Enhancement: The university has implemented biodiversity plans by developing woodlands near athletic facilities into diverse habitats, placing wood piles to attract insects and fungi, and converting green banks into wildflower meadows. The project involves biology students, the local Wildlife Trust, and primary school children in its development.

4.2. Maribor University, Slovenia

The University of Maribor, one of Slovenia's four major academic institutions alongside the Universities of Ljubljana, Primorska, and Nova Gorica, serves a diverse academic community of over 25,000 students, faculty, and administrative personnel. As a significant consumer of water, energy, and other resources, universities must implement various sustainability measures per Slovenian government environmental directives and sustainable development goals (Lukman & Glavič, 2007, p. 110). These mandated measures include the Green Paper on European Strategy for Sustainable, Competitive, and Secure Energy, the National Research and Development Program: Official Document of the Republic of Slovenia

(2006), the Reform Program for Implementing the Lisbon Strategy in Slovenia, Enabling Universities to Fully Contribute to the Lisbon Strategy, Investing in Research: Europe's Action Plan, and the European Union Strategy for Sustainable Development.

Since 2005, the university's administration has pursued significant sustainability initiatives. These efforts contributed to its 210th ranking in the 2019 UI Green Metric World University Ranking and its placement in the 401-600 band of the 2020 Times Higher Education Impact Rankings. A key milestone was the "The Sustainable University" project launched in 2005, establishing a comprehensive sustainable development framework across university operations and administrative departments. In early 2006, the project was shared with the University Student Council, featured in the student newspaper, and presented to other stakeholders. After receiving approval, implementation began in May 2006, requiring substantial organizational restructuring.

The University of Maribor has established the Sustainability Council (SC) and its standing committee to stimulate and coordinate sustainable development projects and enhance interdepartmental exchange and cooperation. The university's new sustainability vision focuses on integrating sustainable development into its operations, research, and consulting services while promoting awareness and cultural values. Its mission encompasses educating world experts, achieving scientific excellence, advancing interdisciplinary research and technology, transferring knowledge to industry, promoting ethical values, enhancing sustainable development across all levels, and encouraging sustainable lifestyles.

Furthermore, the university integrates sustainability into national and international projects through departmental initiatives: social responsibility (Economics), environmental crime studies (Criminal Justice and Security), and the Graduate School of Industrial Ecology under the Sixth Framework Programme for environmental engineering and sustainable development. The university also supports cross-departmental sustainable projects like transportation.

4.3. British Columbia University, Canada

The University of British Columbia (UBC) stands as a global sustainability leader. The university signed the Talloires Declaration in 1930, committing to sustainability in higher education, followed by the Halifax Declaration in 1991 which emphasized universities' leadership in sustainable development. In 1997, UBC became Canada's first university to adopt a comprehensive sustainable development policy, mandating sustainable practices and education campus-wide. The university established its Campus Sustainability Office in 1998 to advance these initiatives.

UBC implements sustainability across four areas: education, research, community service, and environmental impact reduction. The university provides various sustainability programs at undergraduate and graduate levels, from individual units to specialized degrees, while establishing dedicated research centers for sustainability issues. For community engagement, UBC runs on-campus initiatives to promote sustainability awareness among students, staff, and faculty, while partnering with local communities to extend these practices beyond campus. The university also implements sustainable operations to reduce energy, water consumption, and waste. Through integrating sustainability into its teaching, research, and community services, UBC has become a model sustainable community that prioritizes human welfare and environmental conservation ('Abduh & Khalīl, 2021, p. 218).

4.4. Plymouth University, England

Founded in 1892, Plymouth University in England drives change through education and innovation. The university's sustainability strategy is guided by a mission to forge partnerships with students, staff, community members, and business professionals through education, learning, research, and innovation. the aim is to achieve social integration, economic prosperity, and sustainability in Plymouth and globally ('Abduh & Khalīl, 2021, p. 219).

The university seeks to lead in sustainability by pursuing financial, environmental, and social responsibility. It addresses sustainability

challenges through social initiatives, volunteerism, and community engagement, adhering to international teaching, research, and infrastructure development agreements. Plymouth University pursues its objectives through collaborative partnerships, external relations, engagement with student union representatives, and advisory stakeholder groups of external partners.

The university adopted a tripartite approach encompassing educational training, scientific research, and operational processes to implement its sustainability objectives. This comprehensive strategy aims to establish a sustainable campus and empower students by providing in-depth sustainability education. Additionally, the university leverages expert research to identify solutions to environmental, economic, and social challenges.

4.5. Ohio University, United States of America

Ohio University is a prominent institution committed to education, research, and sustainability. The university actively pursues various strategies to meet the needs of its institutions and stakeholders. Ohio University integrated sustainability principles into its teaching mission, recognizing the importance of preserving human, material, and natural resources for future generations. This dedication is reflected in its ongoing efforts to improve the environment and overall quality of life. Additionally, the university has set specific sustainability goals, such as reducing waste by 30% by 2022 and allocating 2% of the total capital costs to projects that promote sustainability within the campus, education, and scientific research system (Bilmayhüb & Dafrūr, 2021, p. 18).

4.6. Benefits of Sustainable University Practices

Analysis of leading international university sustainability initiatives shows their common focus on mitigating environmental threats, adapting to climate change, and preserving future generations' rights to resources and safe life on Earth. This stems from universities' third function of community service and environmental preservation, which in turn benefits academic life quality, graduate competencies, and alignment with current labor market needs (Al-Buraydī, 2015, p. 18).

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The benefits of university sustainability practices can be observed through: effective university-community partnerships, particularly in environmental aspects; achieving financial, environmental, and social excellence and leadership; securing additional funding sources to increase spending on educational services and improve academic life quality and graduate outcomes; supporting decision-makers regarding long-term socioeconomic decisions; enhancing sustainability through increased efficiency, renewable resource use, and reduction of hazardous materials in both community and university operations and suppliers; and addressing environmental illiteracy and raising awareness of sustainable environmental development principles through diverse faculty development programs to achieve social integration, economic prosperity, and sustainability both on campus and in the broader community.

5. Conclusion

The transition toward university sustainability requires several fundamental components. Strategic partnerships with public and private sectors are essential for aligning graduate capabilities with labor market demands, while strong community connections facilitate skill exchange and practical workplace training. Universities must comprehensively integrate sustainable development principles into academic curricula through program innovation and enhancement, ensuring higher education outcomes align with sustainability objectives.

The strategic vision of higher education institutions fosters structural synergy with broader society by integrating educational functions to meet sustainable development requirements. This focus on sustainability contributes to increased research and innovation, enhancing universities' value and institutional positions. In today's context, university sustainability isn't an optional luxury but an urgent necessity, achievable through clear strategies despite implementation challenges.

Based on the findings of this study, the following recommendations are proposed:

- Develop a comprehensive national roadmap for sustainable development, led by the state, with sustainable universities as the foundational step.

- Promote universities as sustainable higher education institutions and leverage sustainability as a competitive advantage to enhance their local and global standing and distinctiveness.
- Strengthen and expand university sustainability curricula and projects to enrich higher education outcomes, build capacity, and increase student participation and engagement.
- Reorient the preparation and training of academic staff to ensure the integration of Education for Sustainable Development (ESD) into teaching practices.
- Prioritize human resource development as the cornerstone for advancing sustainable development.
- Provide financial support for sustainability programs, projects, activities, and initiatives within and outside the university campus.
- Foster collaboration across all sectors of society to develop and innovate scientific knowledge related to sustainability issues.
- Establish professional sustainability programs and certifications in collaboration with relevant partners and stakeholders, offering specialized educational opportunities for professionals and academics interested in expanding their knowledge and addressing sustainability challenges.

6. Bibliography List:

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- Ben Haj, J., & Maghrawah, F. (2017). Al-Tanmiyah al-moustadamah bayna al-ṭarḥ al-nadari wa al-waqie al-amali. Majallat al-Idarah wa-al-Tanmiyah lil-Bouhout wa-al-Dirasat(11).
- Ben Halimah, S., & Khaḍrawi, S. (2016). Waqie wa-afaq al-tanmiyah al-moustadamah fi al-Jazair. Majallat Dafatir Bawadiks(6).
- Beringer, A., & Adomßent, M. (2008). Sustainable university research and development: inspecting sustainability in higher education research. Environmental Education Research, 14(6).
- Besong, F., & Holland, C. (2015). The dispositions, abilities and behaviours (DAB) framework for profiling learners' sustainability competencies in higher education. journal of Teacher Education for Sustainability, 17(1).

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- Ghennim, M., & Abou Zant, M. A. (2007). Al-Tanmiyah al-moustadamah. el ordon: Dar Şafae lil-Nashr wa-al-Tawzie.
- Lukman, R., & Glavič, P. (2007). What are the key elements of a sustainable university? Clean Technologies and Environmental Policy(9).
-