The Role of Universities in Sustainable Transformation

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DOI
https://doi.org/10.18690/um.epf.5.2025.25

ISBN
978-961-286-984-7

Achieving academic excellence requires exceptional dedication, long-term work, and continuous education. The synergy with new techniques, technologies, and trends, the dissemination of knowledge, the development of new curricula, and universities as drivers of innovation are part of the helix model. Universities should provide knowledge and contribute to the development of skills for applying digital transformation and AI. Education for sustainable development should be one of the main priorities in line with SDG 4, which focuses on quality education. The objectives of the research in this paper are:

1. The significance of universities and the key components of their contribution to achieving the SDGs,
2. The contribution of universities to achieving SDG 4, and
3. A comparative analysis of implemented activities and programs that promote learning about sustainable development and digital transformation: Faculty of Contemporary Arts, Serbia, and Faculty of Economics and Business, Maribor.

The methodological framework of the research is based on a qualitative approach through the use of a case study, which enables an in-depth analysis of educational practices and management strategies, in the context of education for sustainable development within specific higher education institutions.

Keywords:
university,
education,
sustainability,
quality education,
SDG

JEL:
A12,
A20,
O10

University of Maribor Press

1 Introduction

The concept of sustainability is often narrowly interpreted as solely environmental sustainability. However, in alignment with the Sustainable Development Goals (SDGs), it is essential to adopt a broader understanding that encompasses economic, social, and societal dimensions.

The SDGs and the Agenda of sustainable development present a unique opportunity for all stakeholders—both nationally and globally—to actively contribute to a more sustainable future. Within this framework, the social responsibility of higher education institutions (HEIs) plays a pivotal role in driving the transition towards sustainability. From an institutional perspective, universities are uniquely positioned to develop innovative educational approaches that foster interdisciplinary and inclusive learning while addressing pressing global challenges.

Education has been recognized as one of the most powerful tools for tackling the sustainable development challenges that have emerged throughout the 20th century, including climate change, poverty, and inequality (Lutz et al., 2014). In this regard, universities contribute significantly to the SDGs, particularly SDG 4, which emphasizes that education should ensure all learners acquire the knowledge and skills necessary to promote sustainable development (UN, 2015). The role of education is thus to provide inclusive, high-quality learning opportunities while fostering lifelong learning.

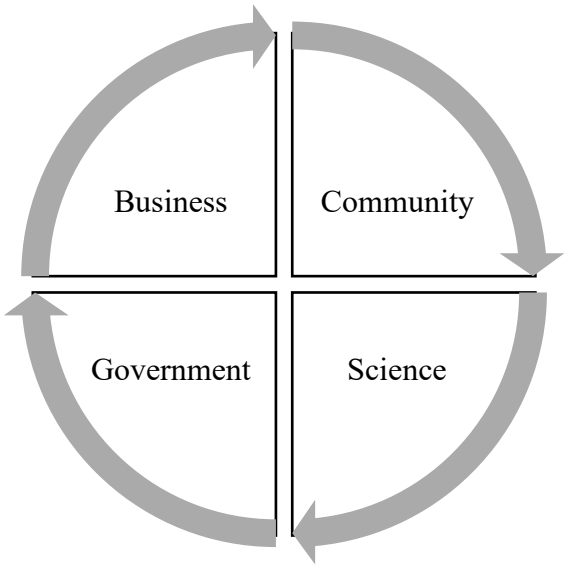
Universities are increasingly designing curricula and cultivating educational cultures that align with and advance the achievement of the SDGs. This transformation of educational curricula is occurring through multiple stages and represents a foundational aspect of a new educational culture within higher education.

Higher education institutions such as the Faculty of Economics and Business (University of Maribor) and the Faculty of Contemporary Arts (Belgrade) exemplify how higher education can contribute to the realization of the SDGs through quality education and innovative academic practices.

2 Universities as drivers of sustainable education and achieving SDGS

The role of universities as key drivers and agenda-setters in sustainable development has been recognized in numerous documents, strategies, and tools for promoting progress. Educational innovations include collaboration with all relevant stakeholders, the development of strategies for curriculum changes, institutional and educational leadership, and the creation of a sustainable institutional culture. Transformative changes occur within paradigms based on repeated and dynamic interactions between all actors.

The quadruple helix model highlights the importance of science and universities in the societal system, while an irregular spiral approach shows how sustainable science can be encouraged by involving all interested stakeholders. The quadruple helix model recognizes the key change agents in four spheres: business, community, government, and science (Carayannis & Campbell, 2009) (Graph 1).



Graph 1. The quadruple helix model
Source: Carayannis & Campbell, 2009.

According to the quadruple helix model, the key stakeholders in these four areas are:

- Business: Local enterpreneurs and National and international corporations,
- Community: Citizens, Professional asociations, Interest groups and NGOs,
- Government: Local, Regional and Nacional and
- Science: Universities, Think tanks and Other knowledge producers.

The tool for implementing sustainability science and involving all relevant stakeholders can be based on an irregular spiral approach, which shows how to transform the current society into a future sustainable society by repeating five basic steps (Boehm, 2000):

1. Co-realization of a common problem
2. Co-envisioning futures
3. Co-shaping into envisioned future society
4. Co-implementation and
5. Monitoring and evaluation.

The downside of the spiral model is that it does not identify key holders of educational integration, but it emphasizes the importance of collaboration and integration towards the future sustainable transformation of society.

In the context of sustainable development, universities are expected to provide institutional and educational leadership. Academic professors think beyond traditional frameworks, applying problem-based and project-based teaching, and facilitating the transformation process. In such an environment, students learn to conceptualize, design, implement, and manage projects (Crawley et al., 2014). A transition higher institution into a sustainable higher institution goes through the following phases (Galán-Muros, 2023):

- Stage 0: Conceptual alignment and rationale
- Stage 1: Awareness raising
- Stage 2: Leadership commitment
- Stage 3: Stakeholders engagement
- Stage 4: Strategy design and draft

- Stage 5: Knowledge provision
- Stage 6: Current initiatives mapping
- Stage 7: Future initiatives prioritization
- Stage 8: Resources provision
- Stage 9: Implementation and
- Stage 10: Long-term sustainability.

This model, like the previous, emphasizes the need for institutional change within the university during its transition to sustainability. Additionally, the model highlights the importance of top leadership at the university, which will be a crucial factor in driving the transition to a sustainable model. The concept of sustainability becomes a shared value among leaders and all employees, and its development is based on the principle of continuity. The change in the teaching curriculum is also an important part of the university's transformation, and according to this model, it refers to the design of programs and courses related to the SDGs, as well as, the training of teachers on how to integrate the SDGs into their teaching.

The model distinguishes three types of sustainability that universities should consider when developing and implementing projects related to the transition to a sustainable university: financial sustainability, sustainable business and organizational sustainability.

Financial sustainability is achieved when a university's sustainable transformation project continues to operate after the planned end date by utilizing new sources of funding. Sustainable business refers to the continuation of the project beyond its planned conclusion, thanks to the new sources of income generated by the project. Organizational sustainability represents the day-to-day functioning of the implemented solution, which continues to operate even after the project ends.

To achieve these forms of sustainability, it is necessary to create a long-term sustainability plan, find new sources of funding, and integrate sustainable practices into the university's everyday operations.

3 Teaching models and strategies contributing to sustainable development in universities

New innovative educational solutions emerge as a result of the transformative change in higher education. These new educational solutions are the outcome of the synergistic effect of changes within universities related to curriculum adjustments and global changes driven by the development of education for sustainable development.

Within universities, changes in educational culture and the understanding of learning take place, with curriculum revision at the heart of these transformations. This process requires a strategic approach through strategies of addition, integration, and reconstruction (Kolmos et al., 2016).

The "addition" strategy involves incorporating more active learning into existing courses. It is the most common approach for transitioning to student-centered learning, evident through active learning strategies at the course and lecture levels in both literature and practice. The "integration" strategy connects existing courses with skills and competencies related to project management, collaboration, and strategic curriculum change. The "reconstruction" strategy refers to restructuring at the systemic level by establishing new institutions or programs that include technical knowledge and professional competencies. This approach facilitates all forms of active learning, including open-ended projects.

Globally, the implementation of the 2030 Agenda and the pursuit of quality education have accelerated the advancement of Education for Sustainable Development (ESD) (UNESCO, 2019). ESD promotes actions aimed at fostering a more sustainable world by encouraging inquiry and empowering individuals to adopt sustainable practices (Tilbury & Wortman, 2004). Like the previously described models, ESD emphasizes the creation of curricula and learning environments that cultivate responsible and sustainability-oriented behavior in students.

Transformed learning models now include active classroom engagement, as well as, problem- and project-based learning. These models combine online and face-to-face instruction, incorporating active learning techniques to enhance student engagement. Practice-oriented learning often involves problem-and project-based

learning and includes professional practice, industry projects, entrepreneurship, and innovation hubs. Supporting structures such as: formal training programs, user forums, mentoring, and implementing mentoring programs and individual coaching, play a key role in facilitating the transition of universities toward sustainability.

The model based on the integration of engineering and technology emphasizes the critical role of these two elements in achieving the SDGs (UNESCO, 2010). In Sweden, higher education policy mandates that engineering students acquire knowledge and competencies related to sustainabilitys (Holgaard et al., 2016).

Universities worldwide are actively developing initiatives aligned with to education for sustainable development. At Aalborg University, megaprojects hhave been implemented to address sustainability challenges through project-based learning. Drawing on a multidisciplinary approach to solving sustainable development challenges, students collaborate on a single sustainability issue, such as addressing household waste, but each contributes from their own discipline (Routhe et al., 2020).

At the National University of Colombia, the PEAMA program (Special Program for Admission and Academic Mobility) was created to improve access to higher education in rural and underprivileged communities and to support better performance on entrance exams. The four-semester program covers areas such as nursing, agricultural engineering, agronomy, veterinary medicine, and animal science.

In line with the university's commitment to sustainable transition and achieving the SDGs, a program has been developed SET4HEI, as an online free self-assessment tool that allows institution to measure their contribution to each of the 17 SDGs based on a a framework of 400 potential activities categorized across four dimensions: Teaching and Learning, Research, Engagement, and Governance & Administration (Galán-Muros, 2023).

3.1 Key recommendations for enhancing the management of ESD

The governance of ESD entails practical actions supported by integrating sustainability into a university's mission and vision, developing interdisciplinary curricula, building the capacities of educators and students, and fostering

collaboration with local communities, businesses, and global initiatives (UNESCO, 2010; UNESCO, 2019; Tilbury & Wortman, 2004; Kolmos et al., 2016):

1) Integrate sustainability into the university's mission and vision.
ESD should be embedded within institutional strategic planning and policymaking, leading to the development of comprehensive action plans that engage all sectors—teaching, research, and campus operations—reflecting a model of responsible and holistic governance.

2) Develop interdisciplinary curricula.
Institutions should revise existing curricula to incorporate topics such as climate change, ethics, and the circular economy, while also designing new programs and modules that merge multiple disciplines, fostering systems thinking and cross-sectoral competencies.

3) Strengthen institutional capacity and build educator competencies for ESD.
This includes providing professional development opportunities and training for faculty to effectively deliver sustainability education. Promoting active learning and student engagement supports the development of critical thinking and problem-solving skills through tackling real-world sustainability challenges.

4) Foster collaboration with local communities and sustainability-oriented businesses.
ESD should include partnerships with local stakeholders to facilitate knowledge exchange and practical application. In addition, educational institutions are encouraged to participate in global initiatives that support the achievement of the Sustainable Development Goals (SDGs).

4 Contributions faculty of economics and business and faculty of contemporary arts to the SDGS

Faculty of Economics and Business (Maribor) and Faculty of Contemporary Arts (Belgrade) are higher education institutions with different study programs. However, both institutions are dedicated to ESD and, through different activities, contribute to the achievement of the SDGs, particularly SDG 4. Below is an analysis of one selected activity from each institution: Intensive programme: Sustinablility in

International Business (Faculty of Economics and Business) and Global Education Week (Faculty of Contemporary Arts).

The Faculty of Economics and Business is dedicated to education and organized the Erasmus Blended Intensive Program: Sustainability in International Business, held in 2022 and 2023 (EPFM, 2023). The program combined theoretical lessons (lectures and workshops) with a practical approach (visits to the Primorska region, discussions, and analyses) to highlight the concept of sustainability in international business and create conditions for building long-term sustainable and resilient socio-economic environments. The program presented methods for implementing sustainability into the business models of 14 companies, making a significant contribution to the Faculty of Economics and Business's ESD.

The multiple benefits and significance of the educational, business, and social approach of the Sustainability in International Business program are:

- Defined key themes of the program in line with ESD,
- Significant themes from the perspective of future opportunities and cooperation with other institutions: Concepts of sustainable international business; Sustainability in the value chain; Sustainability in international marketing; Sustainability in international supply chains,
- Key themes for the development of new projects: Concepts of international business; Benefits and challenges of implementing sustainability in international business operations,
- Key themes for the academic community: Promoters of sustainable development; Green transformation as a sustainable practice in international business; The problem of "greenwashing" and the importance of consumer awareness; ESG reporting standards and reporting challenges; Future perspectives of sustainable development and sustainable business; Digitalization as a sustainable practice in international business; Approaches and models for measuring sustainable business,
- Key topics for students in building an academic career: The concept and importance of sustainable development; The concept of sustainability; Economic, ecological, and social actors of sustainable business; Benefits and challenges of implementing sustainability in international business operations; Sustainability in the value chain; Examples of best practices in

sustainable business by multinational companies; The impact of sustainability on global competitiveness; Recognizing transformational levers in business activities or corporate models in the context of sustainability.

- Applicability of the program framework for the Faculty's future activities and
- The program's best practice example as an encouragement for other higher education institutions to plan and implement similar activities.

Faculty of Contemporary Arts contributes to numerous curricular and extracurricular activities to achieve Agenda 2030. In addition to the partnership with the New European Bauhaus, in 2024, it was the only partner higher education institution from Serbia, Global Education. The Global Education Week, as a program of Global Education of the Council of Europe, was developed specifically to raise awareness about global issues and promote global education as a key tool for fostering solidarity, intercultural dialogue and sustainable development.

In the Global Education Week 2024, the Faculty participated with two activities: "Digital marketing in the function of promoting global education" and "Education for sustainable development through the prism of multimedia production". Students of MAS Creative Industries and MAS Management of Creative Industries participated in the first activity. Students of the fourth year of BA Multimedia production, participated in the activity "Education for sustainable development through the prism of multimedia production". In addition to educational outcomes, these activities are examples of encouraging young people through collaborative learning to creativity and innovation, which improve the quality of education.

5 Conclusions

The paper presents the role of higher education in achieving the SDGs. Significant efforts are being made to build sustainability as part of the institutional environment of contemporary universities. This institutional environment implies the transformation of curricula and teaching organization toward the application of more active methods, problem-based, project-based, and collaborative teaching. Universities contribute to the achievement of SDG4: Quality Education, by

modernizing teaching and preparing students to address global challenges, fostering an educational culture, and creating educational innovations.

The paper presents the activities of two faculties, which serve as examples of good teaching and educational practices that can inspire other faculties. These examples demonstrate how higher education institutions can be at the forefront of achieving sustainable development goals, particularly SDG 4, by creating innovative educational approaches that tackle global issues while enhancing students' skills and competencies for the future**.**

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