European Journal of Sustainable Development (2025), **14**, 4, 733-744 ISSN: 2239-5938
Doi: 10.14207/ejsd.2025.v14n4p733

Rebuilding Education under Global Challenges: Integrating Sustainability into Economics and Management Curricula

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ABSTRACT:
Current global challenges and the dynamics of ongoing changes significantly influence modern university education. Despite the diversity of study programs across universities, it is essential to consider the appropriate integration of contemporary social and environmental topics into educational curricula. The Faculty of Management and Business (FMB) at the University of Prešov focuses on education in the fields of economics and management. Therefore, the education of future economists, entrepreneurs, and managers should also incorporate elements of sustainability, circular economy, and proenvironmental approaches in both production and consumption activities. The aim of this paper is to evaluate the perceptions and attitudes of students (future entrepreneurs, economists and managers), towards the integration of "green topics" into educational content and their application in practice. The results of the questionnaire survey were complemented by the perspectives of teachers through structured interviews, aimed at identifying the need for and possible ways of incorporating green topics into the curriculum from their point of view. The collected data were analysed using a mixed methods approach, combining both qualitative and quantitative research methods, including inductive inference methods. The results served as input for the development of new study programs. Based on these findings, we also formulate proposals aimed at "greening" the existing curricula through the use of creative and participatory forms of education.

Key words: global challenges, education, green topics, sustainability

1. Introduction

Higher education institutions play a crucial role in advancing sustainability. They are key agents in educating future leaders who will contribute to the implementation of the Sustainable Development Goals (SDGs). These institutions shape mindsets that support the spread of SDG principles. As transformational actors, universities influence students' habits and values, supporting the development of a more sustainable and prosperous society. Higher education shapes adult thinking and is often seen as a catalyst for sustainable development. (Žalėnienė & Pereira, 2021).

Abo-Khalil (2024) emphasizes the indispensable role of higher education in preparing future generations to navigate the complexities of sustainability challenges. His research highlights the need to integrate sustainability into academic curricula in alignment

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with the SDGs. Key findings include the essential role of interdisciplinary approaches and the critical need for active faculty involvement in fostering sustainability education. Beyond academia, the pursuit of sustainability goals necessitates partnerships spanning the public sector, business communities, civil society, and local populations. Through collaboration, educational institutions can play a central role in promoting sustainable practices, influencing policy development, and addressing societal needs (Abo-Khalil, 2024). However, despite this potential, some scholars raise critical concerns. For example, Tilbury (2011) argues that universities are not only slow to adopt sustainability but may even contribute to the current sustainability crisis. These concerns are echoed in the research of McFarlane & Ogazon (2011), who critically examine how institutions have historically approached sustainability in the context of broader societal challenges. The authors argue that universities should view themselves as critical links in the chain of sustainability advocacy and should embed sustainability deeply into their institutional culture.

While schools and universities represent essential pillars in the formal provision of environmental education, their efforts do not consistently translate into effective sustainability learning outcomes (Pearson et al., 2005). This discrepancy underscores the need for a more systemic and institutionalized approach. In this context, McFarlane & Ogazon (2011) emphasize that higher education institutions must position themselves as central actors in advancing sustainability, embedding its principles not only into curricula but into academic culture.

Education for sustainability is widely supported and researched; however, the broad and deep implementation of education for sustainability in universities that is needed lags (Higgins & Thomas, 2016). Xiong et al. (2013) discuss the importance of environmental education in higher education and universities as an effective tool for addressing growing environmental challenges. They emphasize the need to introduce environmental elements into study programs and to integrate the principles of environmental protection and sustainable development into academic programs.

In the field of education for sustainability, the link between entrepreneurial skills and other key competences such as foresight, complex problem solving and interdisciplinarity is often neglected. However, Hermann & Bossle (2020) points to possible links between education for sustainability and entrepreneurship education. Lans et al. (2014) state, that sustainable entrepreneurs, i.e. those who proactively facilitate latent demands for sustainable development, are now in higher demand than ever before. Higher business education can play an important role in laying the foundation for these sustainable entrepreneurs. Traditionally, however, educational scholars focus either on the issue of education for sustainability or on entrepreneurship education.

Aithal & Rao (2016) state that academicians, administrators, students need to incorporate awareness and adoption of environmentally friendly practices in the learning process. Also, research realized by Kostadinova et al. (2025) emphasizes the importance of integrating circular economy concepts early in the educational process to foster sustainable economic growth by uniting environmental, social, and economic benefits. University graduates equipped with knowledge in these areas will be more competitive in the labor market, as an increasing number of companies seek employees who understand and can implement sustainability principles.

Offering a full program in sustainability not only adds diversity to the college or university curriculum but also meets an educational need existing in the global market as well as personal professional aspirations of students looking to work in the field. According to Berman (2009, as cited in McFarlane & Ogazon, 2011) sustainability creating and transformation to green economy is producing new and emerging financial and professional opportunities in a saturated labor market. Huttmanová et al. (2024) also focus on the importance of strengthening both green and digital skills among future managers and economists. They emphasize the need for curricular adaptation in response to global challenges and labor market shifts. Tilbury (2011) argues that institutions must go beyond merely integrating sustainability concepts into existing courses. Sidiropoulos (2014) presents examples of economics and marketing courses that have integrated sustainability topics into teaching at various levels of study. It describes different pedagogical approaches – from classroom discussions to comprehensive integration of sustainability into the curriculum and assessment – and analyses student feedback, which shows a positive impact on their attitudes and behavior. Eagan et al. (2002) present an example of an interdisciplinary seminar at the postgraduate level on international and sectoral differences in approaches to sustainable development. The importance of the course is based on the fact that it combines culture, business, and environmental sciences in the study of sustainability. International research (e.g., Žalėnienė & Pereira, 2021; Kostadinova et al., 2025) shows that some universities achieve greater consistency in learning outcomes through standardized frameworks, cross-faculty coordination, and external accreditation schemes.

Instead, universities should embrace interdisciplinary thinking, participatory teaching methods, also supported by Chovancová et al., (2024), real-world research, and the opening of institutional boundaries - extending the idea of sustainable communities beyond the university walls. Adamišin & Pukala (2021); Chovancová et al. (2019) emphasize the need for environmentally oriented higher education with the implementation of practical examples in order to understand current sustainability issues and at the same time highlight the need for greening economically oriented study programs. Tej & Chovancová (2021) perceive the process of greening the study program as an indispensable social innovation for the present. In a similar way, Pearson et al. (2005) point out that despite widespread recognition of the importance of sustainability, formal teaching still leads to inconsistent learning outcomes across institutions. They state that, the current formal teaching of sustainability leads to variable school outcomes. Of more concern, the university sector lags the rapidly advancing sustainability values of business, community and government. Reinvigoration of environmental and sustainability learning requires major structural changes that foster transdisciplinary curriculum development, using fieldwork and real environmental problems to realign delivery to a focus on students, and realigning organizations to promote diversity.

Taken together, these insights underline the urgency of integrating sustainability across higher education curricula. To examine how this is reflected in student attitudes and institutional practices, we conducted questionnaire survey, described in the following section.

2. Material and Methods

The aim of the paper is to assess the perceptions and attitudes of students (future entrepreneurs, economists and managers) towards the implementation of "sustainability and green topics" into educational content and their attitudes towards the application of green approaches in practice. In order to determine the attitudes of bachelor's degree students in economic-management-oriented study programs, we conducted a questionnaire survey at the beginning of the 2024/2025 academic year, in which a total of 280 respondents participated, of which 160 respondents were students of the Management (MAN) study program and 120 respondents were students of the Business Management and Marketing (BMM) study program.

Students answered 9 questions (using answers on a 5-point Likert scale): Q1: I am interested in topics related to the environment and sustainability; Q2: I actively search for information on topics related to the environment and sustainability; Q3: I have encountered sustainability topics in my teaching (at FMB); Q4: I would welcome greater inclusion of "sustainability topics" in the educational process; Q5: It is necessary to discuss more (in the educational process) "sustainability topics", Q6: It is necessary to present (in the educational process) practical examples regarding the implementation of "green/sustainable" measures; Q7: Sufficient space is devoted to information on sustainable approaches in business in the educational process; Q8: I think that if my education also includes sustainability topics, I will be better positioned in the labor market; Q9: A sustainable approach (saving resources, preserving environmental quality, minimizing waste, etc.) is necessary in business.

The results of the questionnaire survey were also confronted with the opinions of educators. Structured interviews (with 6 teachers who participate in both study programs) were carried out in order to assess the need and methods of grasping green topics and their subsequent implementation into the educational curriculum from the teacher's point of view. The mixed methods approach, qualitative and quantitative approaches and inductive inference methods were used for data processing. The Shapiro–Wilk test was used to verify the normality of the data distribution, and the Mann–Whitney U test was used to compare the responses between students of the study programs.

There are also limits of our research, which is based on data collected at a one university and at the first level of study. The research is also limited by the collection and evaluation of data only on the part of the educational institution, and for further in-depth analysis or international comparison of the issue, we plan to continue by collecting and evaluating the opinions of future employers and stakeholders.

3. Results

Contemporary society is confronted with a number of multidimensional challenges, a significant group of which are environmental challenges with an impact on economic and social life. It is obvious that society must find ways to adapt to ongoing changes, with climate change and its manifestations representing one of the most urgent global issues with significant socio-economic consequences. The problems of reducing the quality of the environment and its components, limited availability of natural resources or high energy intensity are a manifestation of deeper systemic imbalances, which can be included in the framework of the so-called. sustainability problems. Given the acuteness,

extensiveness, cross-sectionality and synergy of these phenomena, it is necessary to systematically and conceptually integrate them into educational programs and prepare the new generation to find adequate responses to these challenges. This also strongly affects the education of future managers, economists and entrepreneurs, who will be confronted with them in their practice.

The Faculty of Management and Business of the University of Prešov is one of the largest faculties of economic type in Slovakia and has been preparing future economists and managers for a long time, who find employment in various economic sectors and in the public sphere. In order to maintain the attractiveness and topicality of the educational content, the faculty continuously monitors the quality of the educational process and updates the educational curriculum. Part of this process is also the incorporation of new challenges, current requirements, demand-oriented topics and trends into teaching. These include also green topics, or topics of sustainability.

The paper aimed to examine student responses to the need to implement these topics into their education process. Below we present the results of the survey, which provide a deeper analysis of students' perceptions of the inclusion of sustainable topics into the educational process. The results present their attitudes towards updating the educational content within their study program.

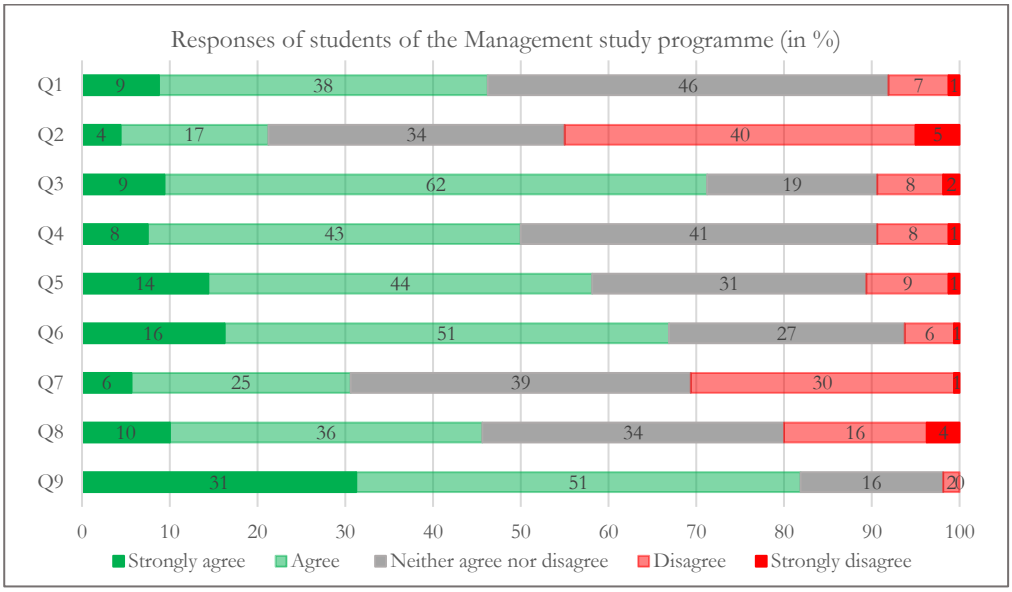

Figure 1: Results of a questionnaire survey of student preferences in relation to sustainability topics in education – responses of students of the bachelor's degree program "Management"
Source: own processing

The results presented in Figure 1 show that 47% of students in the Management study program agreed that they were interested in sustainability topics (Q1), but a large proportion of students (46%) took a neutral position on this issue. At the same time, a large proportion of students (45%) stated that they do not actively seek information related

to the environment and sustainability (Q2), which may be related to the number of other topics that students are confronted with (e.g. also in the online environment). We perceive this fact as a challenge and a need to present these topics in a broader and more comprehensible manner, thus arousing more interest among students. It is clear that the selection of appropriate methods and forms of education will be key in this process. We positively assess that a large part of students (72%) declare that they have already encountered sustainability topics in classes at FMB (Q3), and at the same time, more than half of the respondents said that they would welcome a greater integration of sustainability topics into the educational process (Q4). In another question regarding the need for a broader discussion on sustainable topics (Q5), students expressed agreement (58%), but at the same time a significant group of students could not take a clear position on this issue. A positive finding was that 67% of students agree that it is necessary to present practical examples of the implementation of green/sustainable measures in the process of education (Q6). More than 30% of students also stated that information about sustainable approaches in business is not given sufficient space in the educational process (Q7). This provided us with an impetus for innovation in existing courses, but especially in the process of creating new study programs. An interesting finding was that the majority of students (46%) agreed that if their education included sustainability topics, they would be better positioned in the labor market (Q8), but as many as 34% of students could not take a clear position on this issue. It is encouraging that a large proportion of students (82%) perceive that a sustainable approach is necessary in business (Q9).

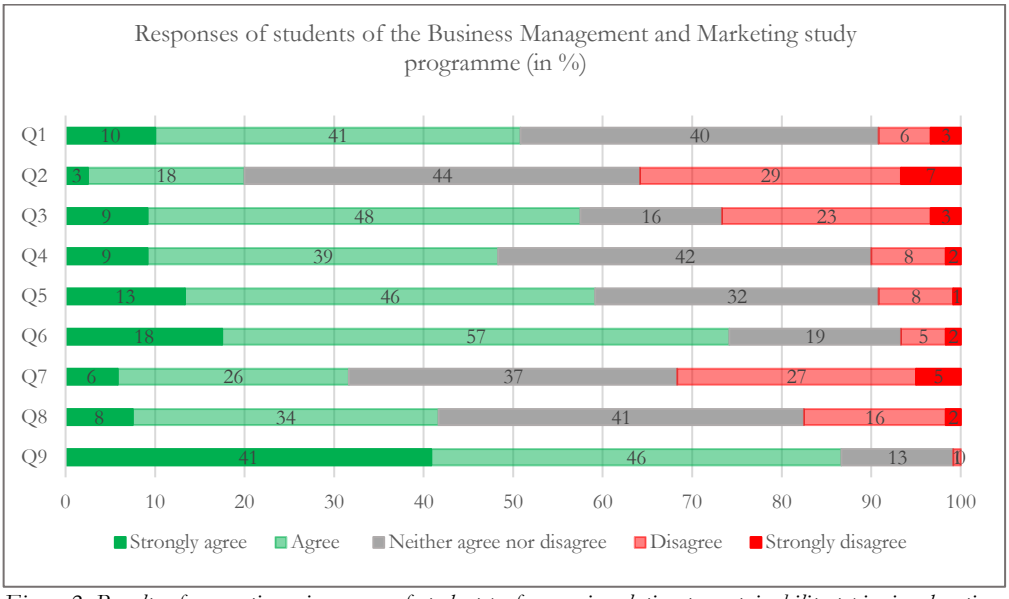

Figure 2: Results of a questionnaire survey of student preferences in relation to sustainability topics in education – responses of students of the bachelor's degree program "Business management and Marketing"
Source: own processing

The results of the questionnaire survey among students of the Business Management and Marketing study program are presented in Figure 2. The responses

indicated that 51% of students are interested in green topics (Q1). Only 21% of students actively seek information related to sustainability and the environment (Q2), and 36% do not seek such information at all. 57 % of students declared that they had already encountered sustainability topics in their education at FMB (Q3), and 48% stated that they would welcome greater integration of sustainability topics into the educational process (Q4), while 42% of respondents were unable to take a clear (positive or negative) opinion on this issue. Most of students (59%) state that there is a need for more discussion on sustainability issues in the educational process (Q5), while as many as 75% of students stated that practical examples of the implementation of green/sustainable initiatives should be presented, as part of the educational process (Q6).

This can be interpreted as an indication of increased student interest, but above all as an increased demand for understandable, practical examples of what we can understand as sustainable or green (processes, products, etc.) and for transforming these topics into an easily comprehensible form.

In response to the question of whether sufficient attention is given to information on sustainable approaches in business in the educational process (Q7), students expressed different opinions, with 32% agreeing, 32% disagreeing, and 37% unable to express a clear opinion. Despite the positive finding that 42% of students believe that if their education also includes sustainability topics, they will be better employed in the labor market (Q8), a large proportion of students (41%) still expressed a neutral opinion on the topic. It is encouraging that 87% of students agree with the statement on the need to apply sustainable approaches in business (Q9).

We were also interested in whether there were differences in opinions on greening education between students of the Management study program and students of the Business Management and Marketing study program. To the aim of this, we compared these groups and verified whether there was a statistically significant difference in their responses using statistical testing. To determine the appropriate statistical test, we first assessed the normality of the data. Using the Shapiro–Wilk test, we verified the normality of the data distribution; the results are shown in Table 1.

Table 1: Shapiro-Wilk normality test results

	p-value (MAN)	**p-value (BMM)**
Q1	4,78E-11	3,94471E-09
Q2	4,27244E-10	8,49163E-08
Q3	5,1717E-14	1,17731E-09
Q4	5,71946E-11	1,00017E-08
Q5	4,76157E-10	9,95269E-09
Q6	3,12473E-11	9,46091E-11
Q7	1,45967E-10	4,13584E-07
Q8	6,96232E-09	6,32271E-08
Q9	8,78633E-13	1,01E-11

Source: own processing

The p-values achieved for individual questions were significantly lower than the significance threshold (0.05), so we conclude that the results achieved are statistically highly significant and that none of the responses have a normal distribution. Based on the results of testing the normality of data (data does not have a normal distribution) using the Shapiro-Wilk test, we proceed to apply the non-parametric Mann-Whitney U-test in the further analysis.

Using the Mann–Whitney U test, we tested the differences in the distribution of values between two groups of students (students of the Management study program and students of the Business Management and Marketing study program) by verifying the hypotheses:

- Null hypothesis (H_0): We assume that there is no statistically significant difference in the responses of students in the Management study program and students in the Business Management and Marketing study program.
- Alternative hypothesis (H_1): We assume that there is a statistically significant difference in the responses of students in the Management study program and students in the Business Management and Marketing study program.

Table 2: Mann-Whitney U test results

	U-statistics	p-value	Z-score	Effect size r
Q1	9247,5	0,571166975	-0.526	0.031
Q2	9122	0,451535284	-0.713	0.043
Q3	11146	0,010641426	2.306	0.138
Q4	9686	0,890656548	0.128	0.008
Q5	9522	0,901750371	-0.116	0.007
Q6	8996,5	0,323979299	-0.900	0.054
Q7	9727,5	0,842265924	0.190	0.011
Q8	9814	0,737290005	0.319	0.019
Q9	8521	0,078922677	-1.609	0.096

Source: own processing

The results of the Mann-Whitney U test, based on the obtained p-values, indicate that respondents' answers to questions Q1, Q2, and Q4 - Q8 do not differ significantly. This suggests that students' attitudes and opinions are similar across different study programs. For these questions, the null hypothesis (H_0) is accepted.

In the case of question Q3 (regarding whether students encountered sustainability topics in class), a statistically significant difference in students' responses was observed. This difference may be attributed to the content of individual study programs and the varying extent to which sustainability is integrated into the curriculum.

The results point to a diversity of student attitudes; however, we did not find significant differences in opinions on green topics between study programs. This is likely influenced by students' previous experiences, their level of awareness of sustainability

issues, and the academic context. It may also suggest that the degree of integration of green topics is relatively consistent across study programs.

This finding further underscores the importance of a flexible and adaptable approach to curriculum development. We therefore recommend adapting and updating course content to reflect this diversity, for example by offering elective courses, applying differentiated teaching methods, or introducing practical modules that account for students' varying levels of prior knowledge and motivation.

We also obtained valuable information from teachers in the form of structured interviews, in which respondents (among other things) stated that:

- Teachers confirmed that they are also interested in green topics.
- They do not perceive any differences in interest in green topics between students of the Management study program and students of the Business Management and Marketing study program (which is also consistent with the results of our questionnaire survey).
- Students ask for practical examples and demonstrations of how green topics can be transferred to business and are also interested in business models that have a green aspect – here, teachers would also welcome more space in education that they could devote to these topics.
- They also mention that if these topics are not directly included in the course content, they do not have enough space to present or explain them to students.
- They would welcome more freedom in choosing teaching methods (organizing excursions or expert´s lectures are often very demanding in terms of administration, time, and communication).
- Students are interested in green topics also in the context of business ideas (in the process of creating business plans), and they perceive sustainable business practices as a competitive advantage.
- They also perceive the need for better and clearer communication across society to create demand/pressure for the implementation of green topics in education.
- They note that environmental topics can be included in the courses they teach (in some cases even more deeply into the educational curriculum).

4. Conclusion

The aim of the paper was to analyse the attitudes and perceptions of students – future entrepreneurs, economists, and managers – towards the integration of sustainability and green issues into educational content, as well as their approach to the application of green solutions in practice.

The results of the questionnaire survey showed that students are interested in sustainability issues. The results of statistical testing showed that students responded to the questions in the questionnaire survey without statistically significant differences (with the exception of questions Q3 and Q9) in terms of their inclusion in the study program. Green issues are familiar to students, and they recognize their importance, especially in the context of future practice and labor marketability. At the same time, the results achieved point to reserves in their active approach to these issues, as well as the need for better

integration of sustainability topics into teaching. We have also identified some specific issues: Business Management and Marketing students place greater emphasis on practical aspects and case studies, while Management students already have more experience with the integration of these topics into teaching. The results thus provide important feedback for innovation in the curriculum and educational methods, while also creating space for more targeted and differentiated educational strategies according to the needs of individual study programs.

When contextualized within existing literature, our results confirm trends observed in studies from Western Europe and Asia (Tilbury, 2011; Xiong et al., 2013), particularly the tension between the widespread recognition of sustainability's importance and the inconsistent translation into effective learning outcomes. Unlike some universities that have institutionalized sustainability through mandatory cross-disciplinary modules, our faculty is still in the process of formalizing such approaches.

We consider it crucial to convey green and sustainable topics to students in a clear and meaningful way, using innovative learning methods and creating space for critical discussion. This is the only way to understand and successfully master these topics. In practice, the following have proven to be particularly effective ways of enriching and modernizing educational content:

- partial modifications to existing courses - adding and updating topics in line with current trends -greening existing courses,
- creating new courses or expanding the range of optional and elective courses,
- creating new study programs that respond to the current needs of practice and society.

We also used the results of the questionnaire survey, complemented by the results of structured interviews, in the process of improving the quality of education, with the aim of preparing students more effectively to identify, analyse, and solve challenges and opportunities related to sustainability, which will be an integral part of their future professional practice. The results of the questionnaire survey, for example, revealed a need for innovation in educational approaches (Q1). At the same time, we found that students prefer more practical examples of the implementation of green and sustainable approaches (Q6). The recommendations of teachers, which point to the need for greater freedom in the choice of methods and topics, were also an important impetus for the further direction. We also took these facts into account in the process of creating new curriculum, which provide more space for innovative, creative, and participatory ways of learning, for example, in the form of discussions with experts from practice, creative workshops (also with elements of design thinking), excursions, and professional practice.

This process and our efforts to modernize and innovate educational content have resulted in the creation of two new and already accredited "green" study programs based on robust economic and managerial foundations:

- bachelor's study program Green Economy and Business
- and the master's study program Economics and Management in Sustainable Innovative Industry,

which FMB, in response to current challenges and trends, has included in its range of study programs in both full-time and part-time forms starting in the 2025/2026 academic year.

This is one of the necessary steps FMB is taking to reflect global challenges and ensure that its graduates are prepared to adequately understand, respond to, and address the environmental and social challenges of today.

Our future research will focus on examining the long-term impact of innovative teaching methods, such as project-based learning, interdisciplinary collaboration, and digital learning tools, on students' attitudes and competencies related to sustainability. We also aim to expand the scope of the research beyond our faculty. Additionally, we plan to incorporate feedback from employers to evaluate how well sustainability-related skills acquired during studies meet labor market expectations and are applied in real professional settings.

Acknowledgment: This paper was developed as part of the projects: KEGA 010PU-4/2023 Innovation of the Course Entrepreneurship in Small and Medium-Sized Enterprises in the Context of Sustainability and Circularity; KEGA 024PU-4/2023 Preparation of an innovative study programme in Green Economy in the field of Economics and Management and KEGA 031PU-4/2025 Implementation of modern educational approaches and tools in the educational process of course Entrepreneurship in small and medium-sized enterprises for the development of key digital competences, GaPU DF/26 Sustainability of European economies from the perspective of environmental taxes. Funded by the EU NextGenerationEU through the Recovery and Resilience Plan for Slovakia under the project No. 09I03-03-V05-00006.

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