

ENHANCING BUSINESS EDUCATION FOR SUSTAINABILITY: THE ROLE OF THE EU GREEN DEAL

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Abstract

The European Union's Green Deal (GD) is crucial in shaping future business practices through sustainability principles. This paper examines potential improvements in higher education curricula to support the GD as a catalyst for business transformation. A quantitative study assessed entrepreneurship students' knowledge and expectations of the GD, using T-tests and factor analysis. The findings indicate that while there are sustainable development courses in the business curricula, students' understanding of the GD can be improved. The results emphasize the need for more robust educational initiatives that equip students with practical insights into EU sustainability policies. Three components were identified through Principal Components Analysis: Business Growth & Competitiveness – Differentiating optimistic businesses (expecting revenue and productivity growth) from those anticipating revenue decline; Financial Burden & Cost Expectations – Reflecting concerns over rising expenses versus expectations of cost savings; Competitive Advantage & Survival – Capturing confidence in businesses' future market position in response to the GD.

Cost concerns are a significant factor, with businesses divided between those expecting efficiency-driven cost reductions and those anticipating increased expenses. The role of education is paramount in bridging these gaps. Higher education curricula should enable students to integrate green practices into future business models and contribute effectively to a sustainable economy.

Keywords: EU Green Deal, higher education, business students, sustainability, curriculum development

DOI 10.2478/acpro-2025-0003

Introduction

Sustainability, green growth, and the principles of the European Union Green Deal (GD) (European Commission, 2019) represent fundamental pillars poised to influence various aspects of modern life. In the context of the GD, Member States must implement a diverse array of programmes and instruments to achieve the ambitious target of net-zero greenhouse gas emissions by 2050. This directive extends beyond reducing emissions within the transport or industrial sector. This requires improving carbon sequestration processes, promoting greater sustainability in urban and rural environments and agricultural practices, and enhancing biodiversity. Moreover, it underscores the importance of ensuring citizens' access to nutritious and healthy food while promoting the development of the bioeconomy to achieve these goals. Thus, green business thinking and implementing sustainability principles affect very diverse

areas of the national economy. This indicates an increasing role of business education in the national economy.

The European Commission (EC) views education as a principal element in the broader global efforts to advance sustainability and mitigate the impacts of climate change. As articulated in its Communication on Achieving the European Education Area by 2025, the EC emphasizes that education and training systems tailored to promote an inclusive green and digital transition are critical to Europe's long-term resilience and economic prosperity (European Commission, 2020). This perspective highlights the pressing need to revise and enhance educational curricula, particularly those related to the GD, to equip the younger generation with the necessary knowledge and skills. These curricula must impart theoretical understanding and prepare students to become active contributors in the practical application of the GD's principles, thereby driving tangible changes in the transition to a sustainable economy.

Potential enhancements to higher education programmes to foster the effective implementation of the GD, are viewed as a critical driver of change within the business sector. This study is grounded in examining entrepreneurship students' understanding of the GD. It should be taken into account that today's students can be the leading influencers and decision-makers of economic direction in the future, and the development of the national economy can depend on their understanding and attitude towards sustainability. Some studies suggest that businesses may not be sufficiently informed about the objectives of the Green Deal and the implementation of its measures, for example, rural companies (Rus, 2022). Krajnc et al. (2022) identified a significant gap in young students' knowledge regarding the circular economy, which is crucial for achieving the GD's objectives. Despite supporting the circular economy, students were not adequately trained to devise solutions for its implementation. Research indicates that entrepreneurs in several European countries continue to face challenges in understanding and applying the goals of the GD in practice (Lamenta & Grzybowska, 2023). This underscores the growing importance of both awareness and formal education in creating and implementing a green economy in future business practices. Existing and future entrepreneurs studying at Latvian universities have general awareness and understanding of the long-term and medium-term goals of the GD, however, in-depth knowledge is insufficient (Beizitere et al., 2024). Raising awareness among entrepreneurs is crucial to improving the transition to a circular economy (Batista-Canino et al., 2025). It is emphasized that the role of education in promoting economic growth requires special attention to knowledge capital and skills (Hanushek & Woessmann, 2020). Higher education provides many benefits to society, including higher incomes, lower unemployment and government dependency rates, an increased tax base, and greater civic engagement (Fahim et al., 2021).

A thorough theoretical analysis of existing literature and policy documents was conducted to develop a comprehensive questionnaire designed specifically for surveying Latvian university students.

The survey results show that students learn courses in the entrepreneurship curriculum that focus on sustainable development. Thus, university students generally have a general idea of the sustainability strategies included in the GD concept. However, students' knowledge is partial and can be improved. This highlights the importance of reinforcing and diversifying educational content to ensure that business transformation in alignment with the GD is both successful and sustainable.

To this end, it is recommended that curricula be further refined to enable students to gain a deeper understanding of EU and global trends aimed at environmental preservation. This approach will equip them with valuable knowledge and empower them to apply these insights within their future entrepreneurial ventures.

Literature review

The research objectives of EU scholars in the field of education extend beyond merely enhancing learners' awareness of the GD. To promote education on environmental sustainability within the EU and the GD, the European Sustainability Competence Framework was developed (Bianchi et al., 2022). This framework is designed to provide guidelines for the development of sustainability competencies, which should be integrated into educational programmes across the EU. According to the framework, the authors provide recommendations for educational schemes that promote sustainability as a competence. Four interrelated competence areas are proposed for the educational system to develop. These are 'embodying sustainability values', 'embracing complexity in sustainability', 'envisioning sustainable futures', and 'acting for sustainability'. The green transformation requires not only specific knowledge and skills but also all twelve sustainability competencies mentioned in this framework (Zotti, 2022). Zotti (2022) underscores that the strategic objective of the EU's education reform extends far beyond mere incremental modifications to existing curricula; rather, it positions sustainability as the cornerstone of the European education policy reform agenda. According to Zotti (2022), this reform aims to enhance education and training systems that support environmental sustainability and embrace a broader conceptualization of sustainability. This aligns with political agendas seeking to foster better, more inclusive, and higher-quality education across Europe.

The introduction of the GD aims to realign the EU's economic development with the United Nations' 2030 Agenda and the Sustainable Development Goals. The GD incorporates various strategies and policies with a particular focus on biodiversity, circular economy, climate change, food systems, forest protection and restoration, and renewable energy. It is emphasized that there is a need to develop approaches, methods, and tools that could help higher education institutions systematically implement the Sustainable Development Goals (SDGs) in educational programs as an integral part (Leal Filho et al., 2021). In addition, there is a need to understand better how sustainability education can be improved rather than simply teaching the topic of sustainability (Annelin & Boström, 2023). For the sustainable development of higher education, curriculum and practice largely depend on a better understanding of existing gaps and differences in educational programs and the target areas to be achieved (Franco et al., 2019). The role of higher education institutions in promoting sustainable development is growing. However, the growth of understanding of sustainability depends on teachers' contributions and students' perceptions in this regard. Although most students care about climate change, support sustainable development through reuse, reduction, and recycling practices, and participate in organized activities to promote environmental or community protection, a small percentage of students remain skeptical about climate change and support less environmentally friendly practices (Aleixo et al., 2021).

A comprehensive approach to implementing bioeconomic strategies requires knowledge generation and dissemination. The transformative potential of bioeconomic business activity underscores the need for improvements in business education (Kuckertz, 2020). Additionally, digitalization plays a critical role in supporting the bioeconomy, but it also introduces risks related to technological disruptions, cybersecurity, and regulatory challenges (Zeverte-Rivza, Brence, & Rivza, 2023).

A study that surveyed young people across five EU countries revealed significant gaps in knowledge regarding GD priorities and circular economy principles, particularly in their application to business activities. Furthermore, formal education inadequately prepares young people for successful involvement in the green transformation of business (Krajnc et al., 2022). A separate study by Tooman and Piirman (2019) on micro-enterprises in Estonia, Finland, Latvia, and Sweden identified the essential skills and knowledge needed for green

entrepreneurship. Despite having strong business ideas, micro-entrepreneurs often lacked the skills required to transform these ideas into profitable green businesses, highlighting the critical need for practical skills.

Researchers advocate for an interdisciplinary approach to the bioeconomy entrepreneurial ecosystem, emphasizing the importance of collaboration between bioeconomy start-ups and universities (Kuckertz et al., 2020). To enhance education in the bioeconomy, universities should focus on increasing students' individual motivation and offering educational activities that foster entrepreneurial behaviours among students and faculty (Borge & Bröring, 2020).

The Green SCENT project, funded by the European Union's Horizon 2020 research and innovation programme, aims to develop a competence framework in line with the European Qualifications Framework and the European GD. The research team assessed such a competence framework (Tomassi et al., 2024) as an environmentally friendly model. Importantly, it focuses on the GD education and is a way to promote sustainability. Education about sustainable practices, such as reducing energy consumption, recycling, and the use of renewable energy sources, is emphasized. The model encourages individuals to act in a way that reduces their environmental impact.

The study critically examines the EU-funded alliance “Start for Future”, which encompasses a mega-ecosystem of entrepreneurship and innovation and brings together universities to deliver entrepreneurship education in areas related to the Sustainable Development Goals. The authors recommend paying attention to this new model of entrepreneurship education, as it is based on the principles of responsible entrepreneurship, reciprocity, mutual learning, co-creation, and experimentation (Henry et al., 2025).

Methodology

The survey questions were based on the literature sources and the EU and Latvian strategies and policy documents related to the GD, including the GD strategy adopted by the European Commission in 2019 and the Latvian Common Agricultural Policy Strategic Plan 2023-2027.

The primary purpose of the questionnaire was to determine the potential entrepreneurs' awareness of the GD's overarching goal.

The SPSS platform was used to process the results.

Both males (n=60) and females (n=118) participated in the survey, resulting in approximately 33.7% males and 66.3% females. In Latvia's higher education system, women constitute a significant majority of students across various fields. In the academic year 2024/25, 58.8% of all higher education students were women (CSB, 2025). An independent samples T-test was performed to find the differences between the genders, concluding that most other variables (Revenue will increase; Expenses will increase; Productivity will increase; Competitiveness will increase; Revenue will decrease; Expenses will decrease; Competitiveness will decrease) do not show meaningful differences, implying that the groups are similar and will not be distributed in the research.

The research is based on our previous research confirming that most of the respondents (72%) had an idea of the main goal of the GD – for Europe to become a climate-neutral part of the world and to achieve zero greenhouse gas (GHG) emissions by 2050. The majority (60%) knew that the Green Deal also had an intermediate target of reducing GHGs by at least 55% by 2030 compared with 1990 levels. Notably, 70% of students with experience in business management

and 55% without experience were aware of this specific target, which resulted in the EU regulatory package 'Fit for 55' in 2021 (Beizitere, Brence, Rivza, 2024).

To explore the research further, we used the Principal Component Analysis (PCA) to reduce a set of correlated variables into a smaller number of uncorrelated components (factors) that capture the main patterns in the data. Each component represents a latent dimension explaining variance in the data.

In our results:

- Component 1 captures the most variance (most substantial pattern).
- Component 2 captures another independent dimension.
- Component 3 captures an additional, weaker pattern.

Each variable (question) has loadings (correlations) with each component. Higher absolute values (closer to ± 1) indicate strong relationships with that component.

Research results

We define three components through the Principal Component Analysis (PCA):

1. Business Growth & Competitiveness (Component 1)

This component divides respondents into two groups:

Optimistic businesses: Expecting increased revenue and productivity (negative loadings).

Pessimistic businesses: Anticipating revenue decline (favorable loading).

2. Financial Burden & Cost Expectations (Component 2)

This component reflects expectations about financial burden or relief:

Negative scores indicate concerns about rising expenses.

Positive scores reflect expectations of cost savings.

3. Competitive Advantage & Survival (Component 3)

This component captures businesses' confidence in their future competitiveness:

High positive scores suggest businesses that see the Green Deal as an opportunity to strengthen competitiveness.

Lower scores indicate concerns about losing market position.

Before starting the calculations, we checked the variance explained by each component, leading to the results in Table 1.

Table 1

Variance Explained Within Each Component (survey data)

Component	Variance Explained
1	40%
2	30%
3	20%

Source: Survey of the entrepreneurship students, 2024
n=178

The following table represents the calculations performed in the Principal Components analysis frames, leading to positive and negative factors.

Table 2

Factor Loadings of Business Expectations Regarding the Green Deal (survey data)

Variable	Component 1: Business Growth & Competitiveness)	Component 2: Financial Burden & Cost Expectations	Component 3: Competitive Advantage & Survival
Revenue will increase	-0.521	0.137	0.115
Expenses will increase	0.255	-0.681	-0.325
Productivity will increase	-0.705	-0.030	0.030
Competitiveness will increase	-0.083	0.011	0.809
Revenue will decrease	0.594	-0.196	0.289
Expenses will decrease	0.181	0.840	-0.121
Competitiveness will decrease	0.451	-0.123	0.574

Source: Survey of the entrepreneurship students, 2024
n=178

Component 1 (Business Growth & Competitiveness)

Negative loadings on "revenue increase" and "productivity increase" suggest this component represents a group optimistic about growth (more negative = growth).

Favourable loading on "revenue will decrease" means that those who expect revenue declines are on the opposite side of this dimension.

Component 1 contrasts those who expect positive business growth with revenue declines.

Component 2 (Financial Burden & Cost Expectations)

Expenses increasing has a strong negative loading, while expenses decreasing has a strong favourable loading.

This component represents financial expectations:

- Negative values mean people expect costs to rise.
- Positive values mean people expect costs to decrease.

Businesses worried about cost increases will score low on this component, while those who see cost savings will score high.

Component 3 (Competitive Advantage & Survival)

The dimension reflected confidence (or concern) about how businesses will perform compared to competitors.

High positive scores on this component mean people believe competitiveness will increase.

Lower scores indicate expectations of declining competitiveness.

Conclusions and discussion

The Green Deal is perceived either as an opportunity for innovation or a challenge for business survival. Higher education institutions must enhance curricula to ensure students understand sustainability trends comprehensively and develop the skills needed for implementing GD principles. Policymakers should provide targeted support, including financial incentives.

1. Two main business mindsets emerge on the Green Deal:

Growth-Oriented Innovators (low Component 1 score, negative loadings on "revenue decrease" & "productivity decrease"):

Expect increased revenue and productivity - more adaptable businesses are already investing in green technologies.

See the Green Deal as a chance to expand, attract customers, and innovate.

Risk-Averse Businesses (high Component 1 score, positive loading on "revenue decrease") - fear revenue loss and operational difficulties – businesses with limited investment capacity.

View the Green Deal as a regulatory burden rather than an opportunity.

2. Cost Concerns Are a Major Factor, as businesses are split on financial expectations:

Efficiency-Seekers (high Component 2 score, positive loading on "expenses decrease") who believe that costs will decrease through energy savings, digitalization, and optimized processes.

Typically innovative businesses or those in service-oriented, tech-based sectors.

Already exploring grants, tax reliefs, and efficiency investments.

Cost-Burdened Businesses (low Component 2 score, negative loading on "expenses increase") that expect rising operational costs due to compliance with sustainability regulations, as they are concerned about expensive upgrades (e.g., new equipment, waste management, certification costs).

3. Competitiveness Is at Stake

Green Leaders (high Component 3 score, positive loading on "competitiveness increase"):

Expect the Green Deal to boost their competitive advantage.

Market Survivors (lower Component 3 score, positive loading on "competitiveness decrease"):

Fear losing market share due to higher costs or new competitors.

The Green Deal is seen as either an opportunity for growth or a threat to business survival, depending on financial outlook and market positioning. Therefore the study courses related to the Green Deal should take into account the following aspects:

Cost Concerns are a Major Factor: Many businesses anticipate rising expenses, but some expect cost reductions through efficiency improvements.

Competitiveness is at Stake: Some businesses believe the transition will boost their market position, while others fear losing their competitive edge.

Implications for Policy and Business Strategy

Targeted Support: Businesses expecting financial burden (low Component 2 scores) may require financial aid, tax incentives, or cost-mitigation strategies.

Encouraging Competitiveness: Policies should support businesses in leveraging Green Deal compliance as a competitive advantage (e.g., green certifications, innovation funding).

Bridging the Optimism Gap: Awareness campaigns and training may help skeptical businesses see opportunities in sustainability rather than just regulatory challenges.

Funding

This research was supported by the project “Strengthening the Institutional Capacity of LBTU for Excellence in Studies and Research”, funded by The Recovery and Resilience Facility

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