The International Journal of Management Education 23 (2025) 101235

Contents lists available at ScienceDirect

The International Journal of Management Education

journal homepage: www.elsevier.com/locate/ijme

Enhancing sustainability consciousness in higher Education: Short- and long-term impacts of a project-based learning approach

Katalin Ásványi [a,*], Eszter Gedeon [b]

[a] Corvinus University of Budapest, Fővám square 8, 1148, Budapest, Hungary
[b] Université Bretagne Sud, Rue André Lwoff CS 60573, Vannes Cedex, 56017, France

ARTICLE INFO

Keywords:
Sustainable
Consciousness
Higher education
Project-based learning
Long-term impact
PRME

ABSTRACT

The purpose of the research is to explore the pedagogical short and long-term impact of a project-based sustainability course in higher education, specifically focusing on its role in developing critical skills related to sustainability consciousness. The course aims to enhance students' knowledge, attitudes, and behaviours concerning sustainability, which are essential components for addressing the interconnected SDGs. Building on techniques of grounded theory, the research investigates both short- and long-term impacts of the course on student consciousness. Data were collected in seven different semesters from 395 students immediately after the course and from 52 students one year later. The study is limited by the use of a structured interview protocol, which may have constrained participants' responses, and by the short interview length, which reduced the depth of qualitative insights. The findings suggest a consistently observed development in students' sustainability knowledge, a more positive attitude towards responsible behaviour, and sustained openness to sustainable practices over time. Additionally, collaborative partners were found to influence students' approaches to sustainability issues, though primarily in the short term. Overall, in conclusion this course demonstrates the effectiveness of innovative pedagogy in cultivating sustainability consciousness, providing a model for universities and educators to expand sustainability education further.

1. Introduction

One of the main drivers of sustainable development is education, which provides an opportunity to shape values and behaviour, develop technical skills, and shape social behaviour and the economic environment (Badea et al., 2020; Eustachio et al., 2024). University students are professionals of the future who, after completing their university studies, will hold important positions in various sectors of society. Therefore, it is crucial that they acquire the knowledge, attitudes, and skills necessary to make decisions and act on the environmental, social or economic issues they face in their work in accordance with the principles of sustainability. Education for sustainable development (ESD) is therefore essential in higher education (Vargas-Merino et al., 2024).

ESD plays a pivotal role in higher education by fostering not only knowledge but also responsibility (Peschl et al., 2023). It encourages students to understand the interconnected nature of sustainability challenges, aligning their actions with the broader global goals, such as the Sustainable Development Goals (SDGs). By integrating sustainability into the curriculum, ESD helps students

This article is part of a special issue entitled: Creative teaching methods published in The International Journal of Management Education.

* Corresponding author.
E-mail addresses: katalin.asvanyi@uni-corvinus.hu (K. Ásványi), eszter.gedeon@univ-ubs.fr (E. Gedeon).

https://doi.org/10.1016/j.ijme.2025.101235
Received 30 September 2024; Received in revised form 30 June 2025; Accepted 1 July 2025
Available online 6 July 2025

critically engage with complex societal issues, ensuring they can navigate sustainability dilemmas and contribute meaningfully to sustainable solutions.

Researchers have already elaborated on the importance of ESD, but measuring the impact of specific sustainability courses is still not mainstream in the literature (Ásványi Katalin, 2021). A key component of ESD is its emphasis on developing critical thinking, collaboration, and problem-solving skills. These critical skills are vital for students to translate their knowledge into concrete, sustainable actions in their professional and personal lives. ESD goes beyond traditional education by integrating interdisciplinary perspectives and emphasizing action-oriented approaches to promote sustainable development. By fostering critical thinking, collaboration, and a sense of responsibility towards environmental, social, and economic issues, ESD prepares students to make informed decisions and take proactive measures following the principles of sustainability. Integrating ESD into university curricula is vital to ensuring that future professionals are equipped to tackle sustainability challenges effectively (Park, Licon, & Sleipness, 2022).

Project-based learning (PBL) is a widely used pedagogical method in higher education and applying it in ESD seems to be promising (Kricsfalusy et al., 2018). The essence of PBL is that students propose a concrete solution to a real-world problem in groups based on the knowledge they have acquired during the course (Pan et al., 2021). In sustainability-related courses, the integration of project-based learning allows students to work in a team on a project related to a real sustainability challenge, collaborate with community partners, and apply their acquired knowledge to explore and implement sustainable solutions (Savery, 2006).

The aim of this study is to explore how a sustainability course at the university level can help build and strengthen students' sustainability consciousness by increasing knowledge, shaping attitudes, and enhancing actions and behaviours in a sustainable direction in the short and long term. Given the exploratory nature of this research, a qualitative approach was adopted, utilizing in-depth interviews to collect data. This method is particularly well-suited for examining complex, understudied phenomena—such as the lasting impact of a sustainability course on students' awareness and actions. Through this exploration, we address how the course fosters the development of critical skills, such as problem-solving and cooperation, which are essential for students' future roles in promoting sustainability.

The sustainability course was a semester-long project-based course involving community partners, emphasizing the importance of collaboration and practical application in developing sustainability consciousness. In this context, we investigate the practical impacts of working with real-world partners on students' understanding and commitment to sustainability.

Three main research questions were proposed:

RQ1: What are the effects of a project-based sustainability course on students' knowledge, attitudes and behaviours toward sustainability?
RQ2: How does the involvement of a community project partner influence these effects?
RQ3: What are the differences in the short-term and longer-term effects?

This study offers a specific pedagogical innovation by integrating project-based learning with real-world collaboration through community partners, enabling students to apply sustainability concepts in authentic contexts. By engaging with complex, real-life sustainability challenges, students developed critical skills such as problem-solving, collaboration, and ethical reflection. The course thus contributes to advancing responsible management education by equipping future professionals with the competencies necessary to navigate sustainability dilemmas and promote systemic change aligned with the SDGs.

Following a review of the literature on the three key components of sustainability consciousness-knowledge, attitudes, and behaviour - and project-based learning, we outline our methodology, which involves conducting in-depth interviews in two phases: immediately after the course concludes and one year later. Subsequently, we present our findings regarding the course's effects on sustainability consciousness, both in the short and long terms. We then discuss our results, emphasizing the development of critical skills and sustainability considerations, before concluding with reflections on limitations and avenues for future research.

2. The theoretical background of the research

2.1. Components of sustainability consciousness: knowledge, attitudes and behaviour

The term 'sustainability consciousness' is a relatively new construct in the literature and can be defined as a result of sustainability education (Kalsoom & Khanam, 2017). Salas-Zapata and colleagues (2018) have investigated processes of knowledge enhancement, attitude change and behaviour improvement, all of which demonstrate changes in sustainability consciousness. In this research, we follow the approach of (Gericke et al., 2019), which examines sustainability consciousness as a set of knowledge, attitudes and behaviours. Gericke et al. (2019) conceptualize sustainability consciousness as an integrated system encompassing knowledge, attitudes, and behaviors that collectively shape an individual's awareness and engagement with sustainability challenges. This holistic approach aligns closely with Benjamin Bloom's classic Knowledge, Skills, and Attitudes (KSA) framework, which categorizes learning outcomes into cognitive, psychomotor, and affective domains. Building on this foundation, Laasch, Moosmayer, and Antonacopoulou (2023) apply the KSA taxonomy specifically within the context of Education for Sustainable Development (ESD), framing sustainability competence as the multidimensional capability to effectively address sustainability issues through the integration of knowledge, skills, and attitudes.

Thus, the concept of sustainability consciousness can be understood as a manifestation of sustainability competence, with the latter providing a structured and widely recognized educational framework that bridges knowledge acquisition and behavioral change. Incorporating this competence-based perspective enriches the understanding of sustainability consciousness by situating it within

established pedagogical theories, fostering clearer communication and alignment within the PRME and RMLE scholarly communities.

2.2. Knowledge

Sustainability knowledge includes knowledge about environmental problems, the ecology of a particular ecosystem or region, related concepts and behaviours that promote sustainability, and the factors that limit sustainability (Salas-Zapata et al., 2018). Knowledge improves problem-solving skills, promotes critical thinking, holistic vision, self-reflection and the development of sustainability values (HEA, 2006). Sustainability knowledge refers to the knowledge of the environmental, social and economic pillars and their interrelationships (Kalsoom & Khanam, 2017). Previous research has shown that students in the courses have heterogeneous knowledge about sustainability, mostly related to the environment (Salas-Zapata et al., 2018; Fisher & McAdams, 2015). However, they show higher levels of knowledge in some areas of sustainability, such as recycling or waste minimisation (Novo-Corti et al., 2018). Mudaliar et al. (2022) confirmed this, as in their study students were able to increase their knowledge on changing waste management habits.

Students perceive that a course on sustainability increases awareness of sustainability issues (Nousheen et al., 2020; Novo-Corti et al., 2018). Several studies have found that a course can have a positive impact on students' awareness (Durmuş & Kinaci, 2021) and sustainability knowledge (Li et al., 2020; Gulacar et al., 2020; Saiful & Setyorini, 2022), including basic and sustainability-related topics, and a course can also help students to develop ecological literacy (Durmuş & Kinaci, 2021).

Sammalisto et al. (2016) studied a complete bachelor's degree programme and found that integrating sustainability courses can increase students' sustainability knowledge in the long term. However, Jung et al. (2019) concluded that a course may have very limited or no impact on students' sustainability knowledge. They measured both objective and subjective (also known as perceived or self-assessed) knowledge and found no difference between the level of objective knowledge of students who took a sustainability course and those who did not. Moreover, the level of subjective sustainability knowledge of students who had taken a sustainability course was lower than that of students who had not taken a sustainability course. Their results show that the level of subjective and objective knowledge is not significantly correlated, suggesting that students who think they know about sustainability issues do not have the exact knowledge. This finding is in contrast to the results of studies that have found increased perceived sustainability knowledge of students after a course (Hicks, 2022; Savelyeva & Douglas, 2017).

A course can also contribute to increasing students' knowledge of sustainability by shedding light on their misconceptions (Gal, 2023), transforming and complexifying their knowledge by presenting the interconnections of the socio-ecological system and developing their critical thinking (Gal & Gan, 2020). Chen (2019) also confirmed in his study that students developed alternative ways of thinking and were able to think critically about sustainability. Gal (2023) also found that the course encouraged students' creative and imaginative thinking about sustainability challenges. In Gal's (2023) study, students developed a broad definition of sustainability that included different perspectives, rather than the one-dimensional understanding that students had before the course. Also, in the study by Sivapalan et al. (2016), students underwent a paradigm shift in their understanding as a result of a course, becoming able to cite concrete and abstract examples of sustainability.

Table 1
Impacts on sustainability knowledge based on the literature.

Knowledge change	
Increase knowledge	Sammalisto et al., 2016; Hicks, 2022; Savelyeva & Douglas, 2017
No effect	Jung et al. (2019)
Effects on knowledge	
Problem-solving ability	HEA (2006)
Critical thinking	HEA, 2006; Gal & Gan, 2020
Alternative thinking	Chen (2019)
Creative and imaginative thinking	Gal (2023)
Holistic vision	HEA (2006)
More complex knowledge	Gal & Gan, 2020; Ben-Zvi-Assaraf & Ayal, 2010; Kim et al., 2012
Uncovering misconceptions	Gal (2023)
Understanding	Sivapalan et al. (2016)
Raising awareness	Novo-Corti et al., 2018; Durmuş & Kinaci, 2021; Nousheen et al., 2020
Knowledge enhancement	Salas-Zapata et al., 2018; Gulacar et al., 2020; Saiful & Setyorini, 2022
Environmental, social and economic pillars	Kalsoom & Khanam, 2017; Gal (2023)
Recycling or waste minimisation	Novo-Corti et al., 2018
Waste management	Mudaliar et al. (2022)
In the development of ecological literacy	Durmuş & Kinaci, 2021
Subject-specific knowledge enhancement	Fisher & McAdams, 2015; Malan et al., 2020; Cole et al., 2019; Moubareck, 2022
Influencing factors	
More courses have more impact	Briens et al. (2023)
Interdisciplinary course	Widener et al. (2016)
Educational approach	Mintz and Tal (2018)
Courses using integrated active learning and specifically addressing sustainable development	Mintz and Tal (2018)

Source: own editing

Through the courses, students can develop more complex sustainability knowledge specifically related to their field of study, such as engineering (Ben-Zvi-Assaraf & Ayal, 2010) or textiles (Kim et al., 2012). The focus of the course on a particular aspect of sustainability also has an important impact on the factors that students consider important in defining sustainability (Fisher & McAdams, 2015). Expanding knowledge is important in the topics covered by the course (Malan et al., 2020), in assignment topics (Cole et al., 2019) and project work topics (Moubareck, 2022).

Several factors influence students' sustainability knowledge building, such as the number of sustainability-related courses, since the more courses students take, the more they know about sustainability (Briens et al., 2023). In addition, Widener et al. (2016) found that interdisciplinary courses facilitate the transfer of sustainability knowledge based on an integrated and holistic concept. The teaching approach used can also have an impact on the development of theoretical knowledge and awareness of sustainability. However, courses that use integrated active learning and explicitly address sustainable development are the most effective for knowledge transfer (Mintz & Tal, 2018). The main findings from the literature are summarised in Table 1.

2.3. Attitude

Attitudes towards sustainability can be either positive or negative (Pouratashi & Zamani, 2022). The components of attitudes include motivations to behave in an environmentally friendly way, value choice, satisfaction with oneself and others, willingness to act, and feelings and anxiety about environmental problems (Salas-Zapata et al., 2018). Kalsoom (2019) defines a sustainability attitude as a persistent attitude towards environmental, social and economic issues that leads to sustainable behaviour. Typically, students develop positive attitudes towards sustainability after the course (Franklin et al., 2023; Gal, 2023). Education about sustainability elicits positive feelings and inspiration (Gal, 2023) as well as enthusiasm (Chen, 2019) from students.

A course can increase the student's sense of responsibility (Balakrishnan et al., 2021) and also develop their sense of social responsibility (Balakrishnan et al., 2021; Franklin et al., 2023). Kalsoom and Khanam (2017) showed that after the course, students became more concerned about the environmental and social aspects of sustainability and more respectful and open towards sustainability. Cheng et al. (2019) demonstrated that affective components of attitudes were strengthened after the course as students became more passionate about sustainability and felt they could personally influence sustainability (Probst et al., 2019), as they perceived that sustainability challenges could be solved, their sense of inertia about environmental issues decreased, and they became more optimistic (Chen, 2019).

The inclusion of real-life challenges (Probst et al., 2019) and extracurricular activities (Balakrishnan et al., 2021) in courses also has a positive impact on attitude change. However, a study by El-Kholei and Yassein (2023) found that the effect of education on attitude change is minimal. Similarly, Jung and colleagues (2019) found that sustainability education had a limited effect on motivating students' attitudes towards the environment, which was also supported by Alattar and Morse's (2021) research that students' attitudes towards food waste changed only slightly after the course. The research on attitudes is summarised in Table 2.

2.4. Behaviour

Behaviour refers to specific actions in terms of how a person responds to a given situation (Schrader & Lawless, 2004), including actions towards the individual and others (Salas-Zapata et al., 2018) that are consistent with sustainability values. The effectiveness of education in triggering behaviour change is not clear from research. Research suggests (Malan et al., 2020; Sivapalan et al., 2016; Whitener et al., 2021) that behaviour change can be achieved in areas specifically targeted by the course. Some components of behaviour can be more easily changed to more sustainable levels. Ryu and Brody (2006) argued that it is easier to achieve change in transport mode and in the purchase of service-oriented or luxury goods than in housing or even diet. In contrast, Merritt and colleagues

Table 2
Impact on attitudes towards sustainability.

Attitude change	
Positive or negative	Pouratashi and Zamani (2022)
Positive attitude	Gal, 2023; Franklin et al., 2023
Minimal change/limited impact	El-Kholei & Yassein, 2023; Jung et al., 2019; Alattar & Morse, 2021
Effects on attitudes	
Value Choice	Salas-Zapata et al. (2018)
Feelings and anxiety caused by environmental problems, worry	Salas-Zapata et al., 2018; Kalsoom & Khanam, 2017
Openness	Kalsoom & Khanam, 2017
Passion/enthusiasm	Cheng et al., 2019, Chen, 2019
Optimism	Chen (2019)
Positive feeling/inspiration/motivation	Gal, 2023; Salas-Zapata et al., 2018
Reduction in feelings of helplessness/willingness to do something	Chen, 2019, Probst et al., 2019
Increasing responsibility	Balakrishnan et al. (2021)
Developing a sense of social responsibility	Franklin et al., 2023; Balakrishnan et al., 2021
Willingness to act	Salas-Zapata et al. (2018)
Influencing factors	
Real challenges	Probst et al. (2019)
Extra-curricular activities	Balakrishnan et al. (2021)

Source: own editing

(2019) found that it is easier to achieve behavioral change in food choice, water and energy conservation, and minimising non-green purchases, while alternative transport, recycling and waste minimisation are more difficult goals to achieve. Whitener and colleagues (2021) observed a significant decrease in the students' ecological footprint for some dimensions (e.g. greenhouse gases, land use), while in the dimension of water use, the students' dietary footprint increased due to an increase in vegetable consumption. Cole and colleagues (2019) identified two factors in the formation of lasting behaviour change: first, for topics in which students were already passionate before the course, and second, for topics where a single action can have multiple benefits.

Mudaliar et al. (2022) have highlighted that students only take small steps and do not engage in transformative, large-scale environmental actions. A study by Jung et al. (2019) also indicates that education has limited influence on behaviour Research has shown that practical and experiential courses, which include not only knowledge development but also critical thinking and reflection on action, have a greater impact on students' attitudes and behaviour (Misseyanni et al., 2020). The characteristics of previous research are shown in Table 3.

2.5. Project-based learning

Pérez-Sánchez et al. (2020) defined project-based learning models as an instructional approach that involves the integration of meaningful content, the development of critical thinking and problem-solving skills, collaboration and communication among students, and the use of inquiry-based learning, the use of open-ended guiding questions, a flipped learning process, the promotion of student autonomy in actions related to the SDGs, the provision of feedback and the explicit presentation of information to raise awareness of the SDGs. In project-based learning, students collaborate in groups to apply the knowledge they have acquired in the course to solve a real problem, with the instructor acting as a mentor or facilitator (Khandakar et al., 2022). Wiek et al. (2014) identified four key characteristics of project-based learning: student-centredness, self-direction, collaborative learning focused on real-life situations, and stakeholder involvement. The paradigm is suitable for sustainability education according to the concepts outlined by Larmer and Mergendoller (2010). For sustainability courses, project-based learning means that students work together in a team to solve a real sustainability problem. They use their knowledge to explore possible solutions to the challenge (Savery, 2006).

Leal Filho et al. (2016) have identified five patterns that support the benefits of implementing project-based learning in sustainability education. First, they are described as a method of raising awareness due to its adaptive nature. Through multi-stakeholder collaboration, it offers opportunities for community partners to engage. In addition to imparting knowledge, it encourages students to take action, which contributes to creating change. The projects provide students with the opportunity to face different challenges, which in turn helps develop their problem-solving skills, shapes their collaborative dynamics and improves their communication skills (Fini et al., 2017). They gain an understanding of the concept of sustainability while developing their talents. Project-based learning is a successful method for teaching sustainability (Kricsfalusy et al., 2018) because it encourages students to think critically about their values (Sipos et al., 2008) and promotes a positive mindset (Perrault and Albert, 2018).

The incorporation of practical and skills-based education has put project-based learning in a prominent position to improve sustainability education. Project-based learning combines complexity and a focus on real-world situations to achieve concrete, solution-oriented outcomes. Educator reviews emphasise that it facilitates the development of sustainability competence by enabling activities such as sustainability assessment and stakeholder participation in a safe learning environment. It also develops leadership qualities that are vital in complex situations, fostering the self-confidence and conflict-resolution skills necessary for collaboration. It increases students' competence and perception of potential outcomes using their existing knowledge and skills (Birdman et al., 2022).

Table 4 identifies the different effects of project-based learning that enrich applicable knowledge, fostering understanding and raising awareness.

Table 3
Impacts on sustainability-related behaviour.

Behaviour change	
Gradual steps	Mudaliar et al. (2022)
Limited impact	Jung et al. (2019)
Impact on behaviour	
Target areas	Whitener et al., 2021; Malan et al., 2020; Sivapalan et al., 2016
Changing transport habits	Ryu and Brody (2006)
Changes in shopping habits	Ryu and Brody (2006)
Minimise non-green purchases	Merritt et al. (2019)
Transforming food choices	Merritt et al. (2019)
Water and energy saving	Merritt et al. (2019)
Reducing the ecological footprint	Whitener et al. (2021)
Influencing factors	
Even before the course, they were passionately interested in	Cole et al. (2019)
A single action can bring multiple benefits	Cole et al. (2019)
Practical and experiential courses	Misseyanni et al. (2020)

Source: own editing

Table 4
Impact of project-based learning on applied knowledge.

Impact	Source from
Problem-solving skills	Fini et al., 2017; Pérez-Sánchez et al., 2020
Cooperative skills	Fini et al., 2017; Pérez-Sánchez et al., 2020
Communication skills	Fini et al., 2017; Pérez-Sánchez et al., 2020
Talent development	Kricsfalusy et al. (2018)
Critical thinking	Sipos et al., 2008; Pérez-Sánchez et al., 2020
Positive mindset	Perrault and Albert (2018)
Conflict resolution skills	Birdman et al. (2022)

Source: own editing

3. Methodology

The complexity of sustainability consciousness raises several issues that require in-depth understanding and exploration, for which qualitative methodology has proven to be an appropriate tool (Kalsoom & Khanam, 2017). In our research, we employed semi-structured interviews as our qualitative method, conducted in two phases. This approach enabled a comprehensive analysis of students' knowledge, attitudes, and behaviors both at the end of the course and one year later. The interview questions were carefully crafted to address key themes related to sustainability consciousness, incorporating insights from the literature and feedback from preliminary interviews. Thematic analysis was used to identify patterns and themes in the data, while ensuring data saturation by continuing interviews until no new information emerged.

The main objective of our research was to explore and understand the impact of a project-based sustainability course on students' sustainability consciousness in both the short and long term. By examining how students internalized and applied sustainability principles, we aimed to assess the effectiveness of the course in fostering critical thinking, as well as lasting changes in knowledge, attitudes, and behaviour. The qualitative approach allowed us to delve into the nuanced ways students developed their sustainability consciousness, providing insights into how project-based learning can be a powerful pedagogical tool in higher education for advancing sustainability goals.

Ethically, the study ensured that participation was voluntary throughout the extended period of data collection. Informed consent was obtained from all participants, who were assured of confidentiality and the right to withdraw from the study at any time without consequence. This ethical framework supported the integrity of the research and the validity of our findings.

We have formulated three main questions:

RQ1: What are the effects of a project-based sustainability course on students' knowledge, attitudes and behaviours toward sustainability?
RQ2: How does the involvement of a community project partner influence these effects?
RQ3: What are the differences in the short-term and longer-term effects?

The interviews were conducted with seven different groups of students in seven consecutive semesters in the BA-level project-based sustainability-focused course in management education at a Central-Eastern European university, Corvinus University of Budapest, which is a PRME member and is committed to advancing responsible management education. (Table 5). This course was recognized with the 2024 PRME Faculty Teaching Award in the Marketing category. Although each student project focused on a specific dimension of sustainability depending on the community partner, the course covered all aspects of sustainability—including

Table 5
Semesters analysed and project partners.

Semesters	Community Partner	The activity of the project partner
Autumn 2019	Ludwig Museum	a contemporary art museum whose exhibitions also cover social and environmental issues
Spring 2020	AdniYoga	providing access to yoga for people in need
Autumn 2020	WWF	working to conserve wilderness and reduce its impact on the human environment
Spring 2021	Ethnic talents	a social enterprise looking for amateurs, especially from marginalised Roma communities, to work as extras or actors in international and national films
Autumn 2021	HelloAnyu	Budapest's first baby-friendly café, an open, inclusive community space
Spring 2022	Kompania Foundation	supporting disadvantaged children to reduce their vulnerability and become successful adults
	Voneszo	promoting child protection culture
Autumn 2022	Onco VR	linking technology with healthcare and health education for children
	Világszép Foundation	providing adoption, individual attention and opportunities for children who have been separated from their families and are in state care.

Source: own editing based on community partners' websites

environmental topics—through lectures and weekly thematic discussions (see Appendix 3 for the syllabus). One of the course instructors, who is also an author of this paper, conducted the interviews. To reduce potential bias related to the dual role of teacher and interviewer, the interviews were held after course completion and grading. The existing student–teacher relationship may have also enhanced openness and depth of responses (Alam, 2024; McGinn et al., 2008).

The objectives of the course were: to provide students with a comprehensive understanding of sustainability principles from various perspectives; to critically examine sustainable business practices in light of associated challenges and opportunities; to apply sustainability principles to real-world problems; and to enhance individual and group knowledge of sustainability issues. Throughout the semester (13 weeks), the lectures (once every two eeks) emphasized the interconnected nature of environmental, social, and economic sustainability, fostering ethical responsibility and a holistic view of the Sustainable Development Goals (SDGs) (Table 6).

Students engaged in project-based learning, which involved group work, individual assignments, discussions, and debates to deepen their critical thinking and problem-solving skills. The course was designed to develop students' critical skills by integrating real-life applications through collaboration with a community partner, facilitated by the Science Shop of the university. This approach not only highlighted the practical aspects of sustainability but also encouraged sustainable decision-making, aligning with the course's pedagogical and sustainability goals. The main features of the project-based course were based on Thomas (2009).

- The project was central to the course, with each assignment directly tied to its outcomes, ensuring a strong pedagogical focus on practical, project-based learning.
- The project addressed a real-world challenge faced by the community partner: the need for more corporate partners to support their sustainability activities.
- Students were tasked with preparing a new cooperation proposal for companies on behalf of the community partner, which involved applying sustainability principles to a real-life problem and fostering ethical and responsible business practices.
- By allowing students to influence the project by choosing the company and developing their own ideas, the course emphasized the development of critical skills such as problem-solving and collaboration.
- The realistic nature of the project—addressing a genuine issue of securing corporate partnerships—provided students with hands-on experience in navigating sustainability challenges, thereby aligning with the course's goals of enhancing sustainability consciousness and fostering responsible management education.

The interviews were conducted with the aim of determining the impact on participants' knowledge of sustainability and changes in their attitudes and behaviour. Over the course of seven academic semesters, in the first phase, 395 people volunteered to participate in the interviews (30 min), while in the second phase, 52 people volunteered. This significant decrease could raise concerns in quantitative longitudinal research regarding the reliability and generalizability of findings. However, as this is a qualitative study, our aim is not statistical generalization but transferability (Leung, 2015). The strength of our approach lies in the richness and depth of the insights gained, which allow readers to judge the applicability of the findings to other contexts (Sandelowski & Barroso, 2007). We ensured methodological transparency and interpretative consistency throughout the research process to enhance the study's trustworthiness (Savin-Baden & Howell, 2012; Silverman & Marvasti, 2008). The structured interview included 11 questions (Appendix 1) in the first phase (short-term impact) and 13 questions (Appendix 2) in the second phase (long-term impact). The basis for creating these interview questions was a combination of insights from previous studies (Tables 1–4), ensuring that the questions were grounded in established research while addressing the specific needs and context of our study. Each interview followed a standardized protocol with consistent questions posed to all participants. The goal was to ensure comparability across interviews while capturing a broad range of student perspectives related to our central themes. We acknowledge that the use of pre-structured questions may have influenced participants' responses and limited the emergence of unexpected themes. The interviews may have elicited concept-driven rather than spontaneous accounts of how sustainability features in everyday life. This poses a key limitation, given grounded theory's emphasis on inductive, experience-based category development.While this ensured consistency across interviews, it also introduced a degree of researcher framing that shaped the data. The interviews were recorded and transcribed for analysis. The transcripts—each ranging from approximately 250 to 350 words—were produced with the assistance of trained demonstrators following a uniform transcription protocol. Although the overall sample size is large, the qualitative approach—grounded in a constructivist grounded theory methodology—was chosen over questionnaires to gain in-depth insights into students' experiences, perceptions, and personal development. This method allowed for the exploration of nuanced and unexpected reflections that would be difficult to capture through standardized instruments. The study is subject to two key methodological limitations. First, the use of a highly structured

Table 6
Characteristics of the course and participants.

Age of participants	20–21
Length	13 weeks
Organization	Lectures (once every two weeks) Practical sessions (once per week)
Field of study	BA in Commerce and Marketing (compulsory elective course), BA in Business Communication (compulsory course)
Language background	Local language
Student population	Local students (no international students attended the course)

Source: Own editing

interview protocol may have introduced response bias by constraining participants' interpretations and limiting the emergence of unanticipated themes. Second, the relatively short duration of interviews and the brevity of responses restricted the depth and contextual richness typically associated with qualitative inquiry. The interviewees were asked pre-defined questions about their experiences during the course, including the project with the community partner and the impact of the course on their knowledge, attitudes and behaviour towards sustainability. Although sustainability education is an established field, the specific long-term impacts of project-based learning on sustainability consciousness are not fully understood. Grounded theory helps to uncover these nuanced effects by allowing themes and patterns to emerge from the data (Wuest, 2012). A constructivist interpretive approach was used to analyze the interview transcripts, i.e. concepts from the literature could be used as codes. First, we used open coding to identify the concepts of knowledge, attitude and behaviour, and then axial coding and selective coding to summarise and explore the relationships (Horváth & Mitev, 2015). Constant comparison was used to contrast the interviews, classify the themes and contrast the newly identified themes with the existing literature. The same analytical methodology was used for both short-term and long-term impacts, however, when analysing long-term impacts, we were able to build on the categories and subcategories already identified in the short-term impact.

The data were analysed building on techniques of grounded theory method (Mitev, 2012). For the data analysis, we adopted the methodology of Gioia et al. (2013), following a two-stage process. In the first stage, we identified first-order concepts that remained closely aligned with the language of the informants. These concepts were then synthesized into second-order themes, capturing underlying theoretical insights. In the second stage, we further aggregated these themes into broader overarching dimensions. Fig. 1 presents an example for the coding process. The same analytical methodology was used for both short-term and long-term impacts, however, when analysing long-term impacts, we were able to build on the categories and subcategories already identified in the short-term impact.

4. Research findings

The following sections present a selection of interview quotes, representing the bulk of the responses. These quotes show that participants have a better understanding of sustainability and have changed their attitudes and behaviours in many ways. Participants in the results are coded to preserve anonymity: subjects are identified by #S1-395 for the short-term impact (S) measure and #L1-52 for the long-term impact (L) measure.

4.1. Short-term effects of the course

In this section, we examine the knowledge constructs the students identified in the short term during the interviews (Table 7). Students recognized that understanding the issue of sustainability is a learning process in which they acquire not only new knowledge but also a range of skills. What they learned in the course helped them to understand the concept of sustainability, to see and understand the interrelationships between the three pillars and to recognise their importance. For the majority of the students who participated in the research, sustainability at the beginning of the course was mainly about the environmental pillar, but as a result of the course they understood the complexity of the concept, including both social and economic issues. For some students, sustainability was a completely new concept. Others had already encountered the concept, but the course increased their knowledge, deepened and broadened their understanding and increased their awareness of the subject. One group of students had heard a lot about these issues but had not thought about the subject in depth, but now they understood its complexity. The course also promoted critical and creative thinking and alternative thinking and highlighted the value of looking at a problem from multiple perspectives to develop problem-solving skills, collaborative working skills and communication skills through debate.

The knowledge gained during the course has generated both positive and negative emotions in the students. In general, they became more open and interested in the subject, they received all the information about it, but they were also surprised and shocked by the cases and examples they were given. Some felt guilty for having acted in an unsustainable way, contrary to what they had been taught. As a result of these feelings, several students' value judgements changed and new values became important to them. The most dominant impact was related to sensitisation, which changed students' attitudes towards the community. Project partners have significantly shaped their attitudes towards social and/or environmental sustainability. However, beyond values, several students

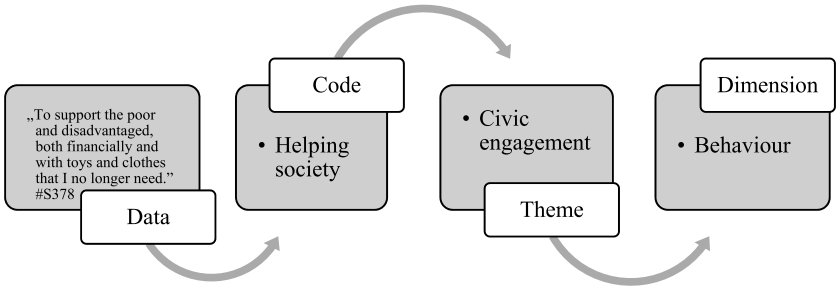

Fig. 1. Example for the coding process based on Magnani & Gioia, 2023 Source: own editing.

Table 7
Sustainability knowledge codes and citations.

Codes	Quotes from
Learn more	„It gave me a better understanding of what sustainability is all about, not only the environmental but also the economic and social impacts, and a much broader, yet comprehensive, view of the concept. I have a better understanding of the issues, I know what I can change (for example, I only buy the food I need and it won't go bad if I don't eat it), I have a more integrated view, I have expanded my prior knowledge and I have learned many new things." #S286
More complex knowledge	„I think that the exercises helped us to get a more complex picture of the CSR activities of companies and thus taught us to think more consciously about it." #S175
Uncovering misconceptions	„We looked into things very deeply and I was often surprised by the activities of a company, I look at some companies in a completely different way." #S345
Attention	„I also think the subject is very useful because it raises awareness among young people about important views and good living." #S54
Recognition	„They made me realise that as a consumer, it's worth paying attention to the companies I support with my money: for example, those that stand up for a value that is important to me." #S36
Understanding	„By having to look at certain situations from a different perspective, the subject helped me to understand that someone has to initiate change and give up either profit or comfort in order for society to achieve substantial results." #S178
Food for thought	„I'm thinking more and more about these issues." #S192
Critical thinking	„I have become more critical of corporate responsibility policies." #S231
Alternative thinking	„I think it's a big part of shaping the way we think" #S384
Creative and imaginative thinking	„The project opened up a „new world" for me because it showed me how to help certain groups in society in a creative way." #S241
Problem-solving ability	„It has highlighted a problem that we need to address at a societal level. Through this project, I was able to take the first small step towards change." #S352
Ability to cooperate	„I was also able to learn and grow from my teammates' stories during our discussions." #S76
Communication skills	„I found the classes thought-provoking, it felt easy to speak out." #S27

Source: own editing

were also inspired: the course encouraged them to formulate their intentions for future action (Table 8).

At the behavioral level (Table 9), students have already consciously chosen values. In some cases, this was mostly embodied in socially accepting attitudes and a rejection of social inequalities. For others, unconscious value choices were also evident, such as the realization that they now view television commercials through a different lens. Information gathering and orientation also strengthened students' sense of individual responsibility. The development of sustainable lifestyles is now clearly reflected in their actions, but there is also a shift in emphasis depending on the project partners. In the case of organisations with a social focus, the impact was greater efforts to help society, whereas in the case of organisations with an environmental focus, it was more on reducing pollution, choosing sustainable products and rejecting unsustainable products. However, conscious employment was a major focus for future action in all six months. In addition to the individual level, some students have become ambassadors for sustainability; they are promoting what they have learned in the course to others. A higher-level effect of this was when students no longer just talked to others about important issues but also tried to influence the actions of others, for example by talking them out of buying something. The most powerful impact of the course at the behaviour change level was when students continued to volunteer with the project partner.

Table 8
Codes and quotes related to sustainability attitudes.

Codes	Quotes from
Openness	„I look at my surroundings with more open eyes." #S176
Enquiry	„I would like to learn more about social entrepreneurship and, if I can, incorporate it into my life." #S192
Curiosity	„I feel myself paying more attention to certain activities." #S222
Guilt	„Even when I buy certain products, I sometimes get a bad feeling." #S334
Shock effect	„The videos presented in the class really „slapped me in the face", they were very moving." #S123
Enthusiasm/optimism	„It's been a long time since I've done something I would have preferred to do, and I was more interested in making sure the end result was of the highest quality." #S62
Developing a community attitude/sense of social responsibility	„I pay more attention to the people around me and I try to take their interests into account before I act." #S321
Sensitisation	„I became more sensitive to these problems." #S289
Change in values/new values	„I realised that I have to appreciate what I have more; if I see a good dress and my first thought is not whether it was made in fair conditions, it's not right." #S294
Motivation/inspiration	„It was inspiring to listen to the examples of others." #S34
Development of demand	„It strengthened my need for sustainable living." #S45
Reduction in feelings of helplessness	„I already felt during the discussions in class that I wanted to pay more attention afterwards." #S167
Increasing responsibility	„Sentences with a lot of little things make a lot of sense and give me an even greater sense of responsibility." #S198
Future action plans	„I'm going to keep an eye on the responsibility activities and when I'm an employee of a company, I'll definitely participate in the responsibility programmes and I'll initiate new actions" #S245 „I'll pay more attention to the labels on products, the packaging, and I'll definitely think more about whether I really need a particular item of clothing, for example." #S280

Source: own editing

Table 9
Codes and citations related to sustainability behaviour.

Codes	Quotes from
Informed decision-making	„I think the exercises in class helped me a lot to make a conscious choice between alternatives." #S127
Conscious employment	„ … I try to apply for a job in a company that puts social responsibility at the forefront." #S356
Reducing pollution	„Use your own cup instead of takeaway cups." #S179
Changing transport habits	„I try to use the car less, I prefer to walk/bike." #S198
Water and energy saving	„I am more careful not to use energy (electricity, water, electricity) unnecessarily." #S112
Reducing the ecological footprint	„ … Although mangoes are my favourite fruit, I prefer to leave them on the shelf because of their large carbon footprint." #S355
Minimising the purchase	„I try to buy as little as possible, and I buy everything carefully. This year, for example, during Black Friday, I only bought what I needed." #S367
Sustainable food shopping	„Now, when you buy food, you also have to consider whether it is a domestic product or not." #S76
Choosing sustainable products	„For example, I switched to the washable pads mentioned above because the teacher mentioned the company that makes them in class." #S92
Rejection of non-sustainable products	„ … during and after the class I developed a kind of rejection of any such business." #S322
Collection of information	„I follow the work of several community partners." #S277
Helping society	„To support the poor and disadvantaged, both financially and with toys and clothes that I no longer need." #S378
Sharing with others	„ … I have talked several friends out of unnecessary purchases." #S385

Source: own editing

4.2. The impact of project-based learning

The projects have also resulted in some changes in knowledge, attitudes and behaviour, as summarised in Fig. 2. Most of the students stressed that direct meetings and visits with civil society partners allowed them to gain a deeper understanding of the functioning and challenges of community partners: *"I was able to see deeper into the problem and understand people's behaviour" (#S134)*. They also developed a greater awareness of certain social problems, such as the employment situation of Roma groups: *"I think I was able to see more into the life and difficulties of Roma communities" (#S261)*. Students acknowledged the importance of community partnres in society and expressed their intention to prioritise these projects in the future. Several students commented that their involvement in the project had inspired them to become members of organisations with social or environmental goals. Several students pointed out that the project had made them think more critically, especially about corporate social responsibility (CSR) activities and the work of community partners.

In general, their attitudes are showing positive changes. The students were very open-minded as the project had increased their knowledge of community partners and they showed a greater willingness to support such efforts: "*I consider it more important to support community partners from an individual and corporate point of view" (#S156)*. Several highlighted that the project had motivated them to take responsibility, which had encouraged them to provide further help to others, whether financial or spiritual: „*It made me aware of how many organisations like this there must be who want to do something for society but they don't have the financial means and for them it is of any help if they are supported, helped by a consumer or a company and as a consumer I will pay more attention if there is such an opportunity to help an organization in some way" (#S367)*. A significant number of students have found that the project has increased their motivation to become actively involved in tackling social problems, whether by making a financial contribution, volunteering their time and skills, or making more informed choices when making purchases. *"The desire to help, the selflessness, and the caring that I saw from the volunteers had a very positive effect on me" (#S298)*. A significant number of students reported that their participation in the project had given them a deeper understanding of the lives and circumstances of others, which led to an increase in empathy and sensitivity towards others. *"It is very good to see that these organisations, despite not making a significant profit, care about children and are able to help in a*

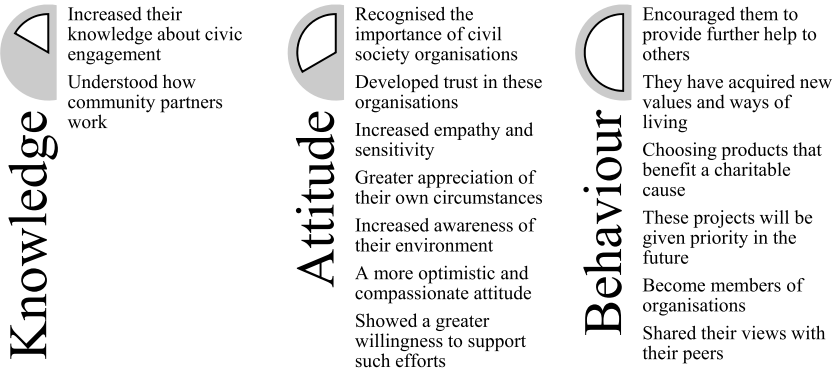

Fig. 2. Impact of project-based learning.
Source: own editing

selfless way. It was very nice to experience this open and welcoming community. Personally, I could not identify with organisations working with children before, but the course has made me look at non-profit organisations in a completely different way" (#S312). The insight into the work of community partners has led many students to develop a greater sensitivity to the well-being of others and a greater appreciation of their own circumstances: *„I have started to appreciate much more what I have and what I can give" (#S338)*. Some of the participants said that the initiative had helped them to become more socially aware and more aware of their surroundings. A significant number of students said that their empathy and willingness to accept others increased as a direct result of their participation in the project, leading to a more optimistic and compassionate attitude overall: *„I learned more about disadvantaged people and my empathy increased" (#S298)*. The project has increased their sensitivity to social issues, such as the prospects and challenges of mothers re-entering the labour market at HelloAnyu project, and thus encouraged them to have greater empathy for this issue. They recognized the importance of accepting diversity and equal opportunities for individuals from all ethnic backgrounds: *"Working with Ethnic Talents has made me realise the importance of acceptance and has shown me a wonderful way to improve the perception of people with disabilities and Roma and to give them the opportunity for a better life" (#S226)*. Initially, some students were sceptical about community partners, but their perceptions changed and they later developed increased trust in these organisations over the duration of the project: *"Kompania was the first foundation I got to know so thoroughly, I was at their „headquarters" where I met the people they support and perhaps I have increased my trust in foundations in general and I consider their work more important than before" (#S357)*. The project also provided an opportunity to learn about and understand the aspirations of community partners.

In terms of behaviour, it is clear that individuals have acquired new values and a new way of life as a result of their experience in the project and their participation in the community group: *"I am more considerate of the interests of others, I have a better appreciation of values, and therefore I try to cut down on waste" (#S379)*. Several people preferred products that support a good cause, such as those that help the disadvantaged or are produced by socially responsible companies: *"Buying more products that support a good cause. (*e.g. *supporting disadvantaged people, buying from companies that really care about the future of society, achieving equality)" (#S385)*. They have become more careful in their choice of restaurants and cafés, favouring environmentally sustainable establishments and those that support local businesses. They are increasingly switching to buying organic food from local farmers. The project encourages individual and community participation. Students have shared their personal experiences and views with their peers, resulting in further social awareness: *"I have learned that encouraging others to protect the environment is as important as what I do about it" (#S134)*.

4.3. Long-term impacts

In analysing long-term impacts, we have sought to highlight specifically the extent to which impacts identified in the short term have been able to persist, or whether other impacts may be observed in the longer term. Students also developed a greater awareness and concern for environmental issues and sustainability overall, regardless of the profile of the community partner. Students often emphasise that they have gained a lot of new knowledge about sustainability and social responsibility through the cooperation. The activities carried out by community partners have been very motivating for them and have further strengthened their enthusiasm for these issues. Many said that the partnership had given them a new perspective on the interconnections between different fields and how they could improve the lives of others. Students were deeply touched by the emotional impact of the events and encounters they experienced during the partnership. Many students reported that working together had improved their ability to understand and care about social issues, and they subsequently showed a greater willingness to support similar projects. Several indicated that they think a lot about the children they met during the project for Kompania and this reinforces their desire to contribute to supporting such projects in the future. The project gave them the opportunity to put their theoretical knowledge into practice. A significant number of students reported that their experiences during the collaboration had been a source of inspiration and motivation, encouraging them to become actively involved in sustainability activities. Working with community partners increased individuals' understanding and connection to sustainability challenges, fostering their sensitivity and empathy towards people facing challenging circumstances.

Students became more aware and concerned about environmental issues and sustainability, which took the form of limiting meat consumption, minimising fast fashion shopping, rejecting single-use products, introducing selective waste collection and adopting more sustainable eating and shopping habits. *„I use the services of smaller local businesses a lot more. I try to* support *local initiatives. I try to shop as consciously as I can. I buy a lot more second-hand or borrow instead of buying new. I buy what I can digitally (books, video games)" (#L14)*. Following the course, some students were actively involved in social responsibility activities, such as collecting donations, volunteering or providing other forms of assistance. *„I started to work for a community partner where I later became a fundraising ambassador" (#L38)*. They also became more critical of corporate social responsibility efforts and communication. Students became more conscientious in their purchases, paying more attention to labels, signs and the ethical principles that companies stand for, and tended to spend more time and effort choosing things that are of good quality and environmentally sustainable. After 1 year, students showed a preference for local and civic initiatives and were willing to support them financially. Many involved their family members and friends in developing sustainable and conscious lifestyles, which included involving family members in sustainability projects or

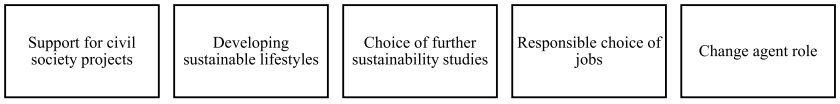

Fig. 3. Long-term impact of the course.
Source: own editing

joint activities. *"During the project, I started talking more with my friends and family about sustainability. For instance, I encouraged them not to buy more food than we actually need, which helped us reduce waste and be more mindful of our consumption" (#L17)*. Students have actively used recently acquired knowledge, principles and values in their education, for example through theses, scientific research or other learning projects. They have increasingly chosen courses and initiatives that actively promote sustainability and social responsibility. *„Now that we are already working, we are choosing a job based on aspects we learned about in the course, such as choosing a family-friendly, holistic and community-building company" (#L35)*. There were also students who *applied what they had* learnt in the course to the running of their own businesses. *Selective rubbish collection, the inclusion and staging of more socially sensitive works, the absolute ban on leafleting" (#L49)*. The main long-term impacts of the course are shown in Fig. 3.

5. Discussion

Based on the results presented above, we were able to identify changes along the elements of students' sustainability consciousness - knowledge, attitudes and behaviour - as shown in Fig. 4. Although, it has to be noted that students were influenced by multiple factors beyond the course itself (De Young, 1993*)*, highlighting the limitation of assessing the impacts of a single course without considering external influences *(*Zsóka & Ásványi, 2023*)*.

Contrary to the results of Jung et al. (2019), our study shows that knowledge can be increased in the short and long term by participating in a project-based course. In assessing their own knowledge, students recognized that knowledge involves not only the acquisition of new information, but also the ability to think critically and analyze complex concepts. This is in line with the findings of Kalsoom and Khanam (2017). According to Salas-Zapata and co-authors (2018), many students had varied prior knowledge of sustainability, but the topics, discussions and assignments helped to expand their knowledge and improve their understanding of the complexities of sustainability, which supports the findings of previous authors (Gal, 2023; Gal & Gan, 2020; Mudaliar et al., 2022). The concept of sustainability was strongly linked to the environmental component in the students' minds prior to the course, as highlighted by Salap-Zapata et al. (2018) and Fischer-McAdams (2015), while the course effectively expanded narrow-minded thinking towards a holistic vision. In the longer term, the students' understanding of sustainability has evolved and their level of awareness has increased, encouraging them to gain further knowledge on the topic through further sustainability-related courses or by writing a thesis. This has enabled them to broaden their expertise and deepen their understanding of sustainability.

The students' attitudes towards sustainability varied, but as Misseyanni et al. (2020) found, the majority of them were clearly well influenced by the knowledge gained. However, some students experienced unpleasant feelings such as a sense of shame or shock, which Pouratashi and Zamani (2022) highlighted in their research. Negative emotions could be considered as a primary consequence, but the change in attitude could still be turned into a positive one afterwards. The shock motivated many students to pay more attention to these issues and become more receptive to them, confirming the findings of Kalsoom and Khanam (2017).

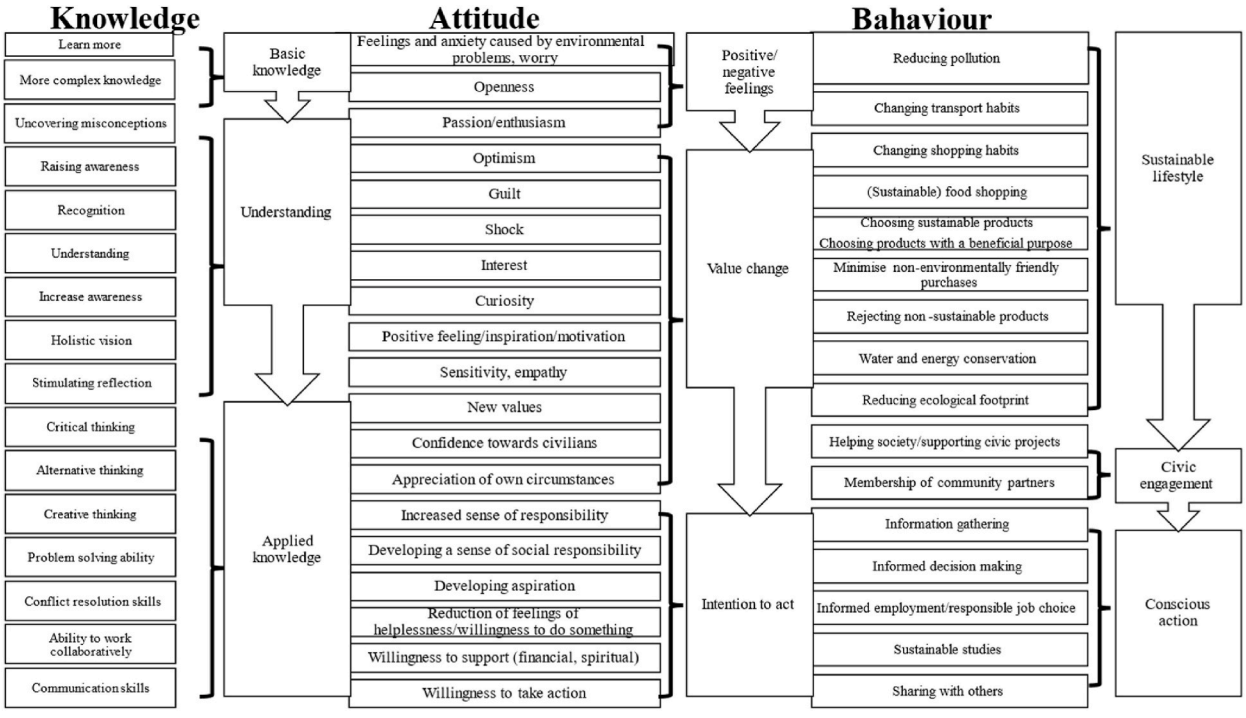

Fig. 4. Potential impact of project-based courses on sustainability consciousness.
Source: own editing

Some students reported experiencing unpleasant emotions, such as shame or shock—reactions that Pouratashi and Zamani (2022) also observed in their research. Although these negative emotions may appear to be an immediate consequence, they can ultimately lead to positive change. In fact, the initial shock prompted many students to engage more deeply with these issues and become more receptive to them, aligning with the findings of Kalsoom and Khanam (2017). This reaction bears some resemblance to the concept of eco-anxiety—the chronic fear of environmental catastrophe (Clayton & Nesnidol, 2017). However, our study does not provide sufficient data to explore this phenomenon in depth.

Jung et al. (2019) argue that the course has a limited ability to motivate students to consume more sustainably and increase their willingness to act, the opposite of which our study showed. Students' self-identity is already established and their values have changed in favour of sustainability, as evidenced by the research of Salas-Zapata et al. (2018). As found by Franklin et al. (2023), students' sense of social duty manifested itself in a more positive attitude towards community partners and increased trust cultivation, resulting in increased empathy and sensitivity towards such organisations. As a result of the course, their receptiveness to the topic was sustained and they showed additional motivation and a greater willingness to engage in tangible actions such as volunteering, i.e. a clear desire to do something, as Chen (2019) found.

Contrary to the findings of Mudaliar et al. (2022), in our study we observed that students not only took small steps towards sustainability after the course, but also developed behaviours that led to larger changes as choosing sustainable jobs. Consistent with the research findings of Kalsoom and Khanam (2017), students generally changed their consumption behaviour by reducing their purchases, choosing sustainable products such as organic and locally sourced products, and rejecting unsustainable products. This also led to a reduction in their environmental pollution, as previously found by Sivapalan et al. (2016). However, our research also revealed a dominant shift in behaviour towards society, with students increasingly contributing to society through financial support or volunteering. Gathering more information about sustainability allows them to follow more sustainable principles and choose employers that align with these ideals. In addition, our results show that a larger proportion of students have not only transformed their own lives but have also passed on the principles and values to their family and friends and have taken on the role of change agent.

Students have retained the sustainable lifestyle they have learned through the course in the long term. Although they did not develop new practices, they continued to participate in selective waste collection, as this is an area where it is easier to make a long-term impact, as observed by Merritt et al. (2019). In addition, some students reduced their meat consumption, more individuals stopped buying fast fashion items, and their awareness of labels and certifications increased. Some students now choose to volunteer or provide financial support to an organization. Furthermore, they have taken additional courses on sustainability that have reinforced these behaviours and helped to sustain them.

While there is a clear positive change in knowledge, the change in behaviour is not obvious, as highlighted by Kalsoom and Khanam (2017). The change in knowledge and attitudes is certainly useful in shaping future lifestyle and workplace decisions, teaching them how and what to prioritise in terms of sustainability in corporate governance or in their daily work. Overall, students' consciousness of sustainability has changed in a positive direction, as evidenced by changes in knowledge, attitudes and behaviour.

This study contributes to ESD literature by showing that education can effectively expand students' understanding of sustainability beyond the environmental dimension, fostering critical thinking and a holistic perspective. It also demonstrates that ESD can lead to long-term changes in students' attitudes and behaviors, encouraging sustainable consumption, social responsibility, and active engagement in promoting sustainability.

The implementation of project-based learning has had a positive impact on the understanding of civil society and community partners, as noted by Leal Filho et al. (2016). This led to an increase in critical thinking, as supported by the findings of Pérez-Sánchez et al. (2020), and knowledge transfer also contributed to an increase in their awareness, in line with the findings of Leal Filho et al. (2016). The initiative had a significant impact on their motivation, similar to what was found in the study of Leal Filho et al. (2016), resulting in an increased willingness to help others. Their empathy, traditionally determined by the target group of the organization, such as the Kompánia for Disadvantaged Children and Ethnic Talents for Roma, undoubtedly increased. At the same time, they have also developed a heightened awareness of a wide range of issues, such as cooperation with WWF on environmental issues or the impact of the Ludwig Museum project on cultural preservation. This fosters a positive mindset, as argued by Perrault and Albert (2018). The projects had a significant impact on students' behaviour, for example, they were significantly more attentive to waste reduction after the partnership with WWF. A remarkable transformation also occurred when individuals attached more importance to their personal circumstances as a result of the impact of social initiatives. As a consequence, the support of a noble cause is also seen as a crucial factor when making a purchase. A remarkable result of the course was that students passed on their experiences to others, thus confirming the multiplier effect. Similar to the results of Pérez-Sánchez et al. (2020) and Birdman et al. (2022), the project improved their problem-solving and collaborative skills. In parallel, several students highlighted improvements in communication and leadership skills. This provides evidence that project-based courses can not only impact consciousness and its components through this approach but also promote skill development, as noted by Kricsfalusy et al. (2018).

This study contributes to PBL literature by demonstrating that project-based learning enhances students' critical thinking, problem-solving, and collaborative skills, while fostering empathy and social responsibility through partnerships with community organisations. Additionally, it highlights the multiplier effect, showing that students not only adopt more sustainable behaviors but also share their knowledge and experiences, amplifying the impact of the learning process.

6. Conclusion

The aim of this study was to demonstrate the impact of a sustainability course on students' consciousness in both the short and long term. Our findings provide valuable guidelines for higher education institutions and lecturers designing sustainability-focused courses.

To enhance sustainability consciousness, curricula should integrate knowledge from environmental, social, and economic perspectives and emphasise active student participation through project-based learning. This pedagogical approach not only enhances knowledge but also significantly contributes to the development of critical skills, including critical thinking, problem-solving, and collaborative skills, which are essential for addressing complex sustainability challenges.

The main lesson of the study is that even a course on sustainability can indeed increase students' knowledge and effectively shape their attitudes and actions towards sustainability, not only in the short term but also in the long term. The results confirm the effectiveness of the course in teaching the principles of sustainable development, as a single course can be able to change students' sustainability consciousness in a single semester. In terms of knowledge, students can not only increase their knowledge, but also gain a better understanding of the subject, and an understanding of sustainability issues, and the course can encourage critical thinking and provide them with applied knowledge. As the sustainability challenge becomes more pressing, the course curriculum must be up-to-date with global trends and the issues themselves, focusing on different areas of the economy. All these knowledge elements will better equip students as experts to contribute to promoting sustainability in their workplace. Through the courses, higher education institutions can create and transfer knowledge that can impact students in all aspects of their lives, as experts, as members of society, as consumers and as producers; thus, placing even greater responsibility on education.

There are smaller differences in students' sustainability consciousness among the semesters analysed, which may be because the choice of the course project partner was generally associated with a more dominant presence of one or the other dimension of sustainability. If the project partner's activities are more socially focused (e.g., AdniYoga, Kompania), it has a strong influence on students' social sensitivity, attitudes and behaviour towards people, while a partner with an environmental focus (e.g. WWF) has a much stronger influence on students' environmentally sustainable consumption and lifestyle.

Our research results show that, despite the diversity of emotional effects, the overall impact of knowledge gain on attitudes and behaviour change is positive but varies. It is relatively easy to increase students' openness and responsiveness to a topic; however, changing the intention to act takes more time. Developing concrete actions is even more difficult, as many obstacles, often outside the scope of the course, need to be overcome to achieve a more sustainable lifestyle. At the same time, identifying problematic points helps and guides sustainability course instructors on where to go further in shaping attitudes and alleviating obstacles. To develop future professionals committed to creating and operating a more sustainable economy and society, courses should inspire sustainable business operations and sustainable employee attitudes, the removal of perceived and real barriers to conscious consumer purchasing, and an open, receptive and active attitude. By continually refining pedagogical strategies and course content, higher education institutions can better equip students with the skills needed to contribute effectively to a sustainable future. Students should have the opportunity to take sustainability courses at various levels, allowing them to deepen and specialize their knowledge in this field. Our findings suggest that this approach can help reinforce and sustain positive behaviors over time. Students enrolled in sustainability courses have the potential to become change agents, extending the positive impact of their learning into society. To amplify this influence, courses should incorporate projects that actively engage students' friends and families in sustainability-related activities.

Students' personalities, interests and commitment to the subject also influence the impact of the course on them. Almost all students on the course come from different backgrounds of knowledge and experience. Their initial knowledge of the subject also varies. Some students are confronted with the subject for the first time and others have a deeper knowledge and an established, conscious attitude. Future research should therefore measure students' knowledge, attitudes and behaviour before the course.

Our study uses qualitative research to evaluate the effectiveness of sustainability courses, but further research is needed to gain a deeper understanding of how courses can help to build sustainability consciousness. In this study, we examined one particular course at one university over seven semesters, but the validity of the research could be enhanced by examining similar courses at other universities or courses at other universities. One original aspect of this study is its examination of short-term (immediately after the course) and long-term (one year after the course) impacts. Future research could investigate effects over a longer period, such as two years or more.

Future research should incorporate pre- and post-course assessments to more precisely measure changes in students' sustainability competence and isolate the specific impact of the course. The inclusion of control groups and longitudinal designs would further enhance the understanding of how sustainability consciousness develops over time and the role of prior interests and program selection. Such methodological refinements will strengthen the robustness and generalizability of findings in sustainability education research.

Although data collection extended through the COVID-19 semesters, the course structure and syllabus remained unchanged. Key elements—such as community partner engagement and interviews—were adapted to online platforms without altering the core learning experience. Nevertheless, potential contextual effects of the pandemic period remain a relevant direction for future research.

A further limitation of our study is that it is difficult to assess the extent to which changes in student consciousness depend on a particular course and the extent to which they depend on other factors outside the course. In addition, the results show changes in students' perceived knowledge, attitudes and behaviour, which may not be the same as actual consciousness. This study used qualitative methodology to demonstrate the effects of the course. A more complete picture requires a combination of methodologies, a deeper understanding of the changes in the elements of behaviour and the identification of additional influencing factors. The use of self-reported data may introduce biases, such as social desirability and recall bias, particularly in the long-term phase. Future studies could address this by combining self-reports with objective measures (e.g., behavioral observations, validated scales) and by ensuring anonymity to reduce bias. These strategies can improve the validity and reliability of sustainability education research.

In summary, the course represents a meaningful pedagogical contribution by bridging sustainability theory and practice through experiential, project-based learning. It effectively fosters the development of critical thinking, collaboration, and reflective capacities—skills essential for addressing real-world sustainability challenges. By working with community partners, students not only gain

insights into the complexity of social and environmental issues but also adopt a proactive and responsible mindset that supports the broader goals of responsible management education.

CRediT authorship contribution statement

Katalin Ásványi: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Resources, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **Eszter Gedeon:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Data curation, Conceptualization.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used ChatGPT to improve the English language of the article. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

Funding

This research was supported by the Hungarian Academy of Sciences (Magyar Tudományos Akadémia) through a research grant for researchers with children (KGYNK2023-64).

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

I would like to express my sincere gratitude to the students who participated in the post-course interviews.

Appendix 1

1. What do the concepts of responsibility and sustainability mean to you?
2. How do responsibility and sustainability appear in your daily life?
3. What was your overall impression of the classes during the semester?
4. How do you think the individual and group assignments influenced your attitude and behaviour toward sustainability (in terms of consumption, employment, and community)?
5. How do you think the joint project with the civil organization influenced your attitude and behaviour toward sustainability (in terms of consumption, employment, and community)?
6. How do you think the challenges influenced your attitude and behaviour toward sustainability (in terms of consumption, employment, and community)?
7. Which topic of the course had the greatest impact on you? Why?
8. In your opinion, how has your environmental awareness changed over the semester?
9. In your opinion, how has your social awareness changed over the semester?
10. What topics or issues related to the course do you think are worth sharing?
11. What teaching methods (videos, case studies, bad/good examples, debates/discussions, etc.) do you think are most effective in shaping students' sustainability awareness? What influenced you the most?

Appendix 2

1. How do you understand corporate responsibility/sustainability at the organizational level?
2. What does responsibility mean to you on a personal level?
3. How does responsibility appear in your everyday life?
4. Can you recall one or two things from the CSR course that still stand out to you?
5. What impact did what you learned and experienced in the CSR course have on your attitudes and habits? What changes have you made? Please give some examples!
6. Thinking about the organization we worked with during the semester project (e.g., OncoVR/Világszép Foundation), how much do you think collaborating with this partner influenced your knowledge, attitudes, or behaviors related to sustainability?
7. Have you learned more about sustainability since then? If yes, in what form and in which courses?
8. Since then, have you engaged with the topic in any other way at the university? (e.g., student research, thesis topic)
9. How conscious do you consider yourself in terms of social responsibility? How does this manifest in your daily life and habits? Do you notice any changes since the course? What do you think caused these changes?

10. How conscious do you consider yourself in terms of environmental responsibility? How does this manifest in your daily life and habits? Do you notice any changes since the course? What do you think caused these changes?
11. Does sustainability influence your consumption or purchasing decisions in any way? If yes, how?
12. When choosing a workplace, does the company's CSR activities or stance on environmental or social issues and sustainability play a role in your decision?
13. The next question concerns your role in the community. By this, I mean whether you are interested in the activities of certain nonprofits, more sensitive to communities or minorities, willing to help disadvantaged groups, or interested in volunteering or donating. Do you consider this community involvement important? How characteristic is this of your habits, or do you have such intentions?

Appendix 3. Course syllabus

1. Core data

Course code	Credits	Semester
	5	fall and spring
Course title in English		
Corporate Social responsibility		
Course title in Hungarian		
Vállalati társadalmi felelősségvállalás		
Course title in other language		
-		
Course leader	**Institute**	
	Institute of Sustainable Development	
Course type	**Type of final assessment**	
elective	Grades are **earned** by the students based on their class attendance, class participation, their achievements in the assignments (group or otherwise) and any quizzes, homework and midterm and final exam (where applicable). If the student completed at least one of the course takes either in full or in part, the subject can only be closed with a grade.	
Language of instruction	**Class schedule**	
Number of theoretical classes per week (full-time programmes)	**Number of practical classes per week (full-time programmes)**	
6	13	
Term when the course is announced/started		

2. Main features

Course objectives

The course aims to highlight the most important issues of Corporate Sustainability and Social Responsibility. Due to the challenges of our rapidly changing world like mitigation of climate change impacts, the need for radical (system) innovation, or solving social, environmental and economic problems simultaneously, the triple bottom line has become a business case in the corporate world. The course focuses on exploring the drivers behind Corporate Sustainability and CSR strategy and the implications of sustainability challenges to corporate reality

Brief description of the course

Our future lies in building sustainable enterprises and economic reality that connects industry, society and the natural environment. The concept of Corporate Social Responsibility can be applied to business organisations as a mechanism for measuring social, environmental and ethical performance. CSR efforts are often publicized in sustainability reports, but the intentions and the performance behind reporting are ambiguous and make critical evaluation necessary. The course is aimed to synthetize theory and practice, providing the main approaches, models and assessment tools to corporate sustainability and CSR, while testing their relevance and application in the real world.

3. Learning outcomes

Skills	Knowledge	Attitudes	Autonomy and responsibility
Systemic thinking Handling the complexity of	Understanding the essence of sustainable development	Critical assessment of corporate sustainability reporting.	Responsile for their work

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(*continued*)

Skills	Knowledge	Attitudes	Autonomy and responsibility
sustainable development, critical thinking and questioning, longer term view, social and environmental sensitivity, problem solving, individual responsibility, reflexivity, value based decision making, acting fairly and ecologically, empathy and change of perspective sustainability mindset	Understanding why it is necessary to integrate social and environmental aspects into corporate strategy. Understanding the most important motives and influential factors behind the CSR activity of companies. Getting to know up-to-date examples of company practice regarding sustainability challenges and corporate social responsibility, resulting from the presentations of guest speakers, the case studies and the experience of company visits.	Becoming familiar with the most crucial issues of CSR today, as a result of lectures, discussions and analysed cases Development of argumentation in case of sustainability issues regarding companies.	

4.Assessment system of the course

Method of assessment

The course is based on a systematic combination of lectures, seminars, company visits and civil project.

The lectures follow a specific structure, focusing on the most relevant issues of corporate sustainability and CSR and are presented by the course leaders and guest lecturers. The guest lecturers are selected on the principle that the activity of their company should closely relate to the topics discussed during the course. The guest lectures provide an up-to-date insight into the corporate practice of the discussed and evaluated topic (e.g. renewable versus non-renewable energy, sustainability reporting, social focus of CSR etc.). Within the framework of the project-based course, the students work together with a community partner, a relationship organized by the Corvinus Science Shop.

The issues presented in the class are always discussed with the students; reflection and feedback build a very important part of the course. Lectures are supplemented by case study discussions. To strengthen field experience of students, company and or community partner visit will be organized during the course, which students are expected to prepare for with specific questions into CSR and sustainability activity of the selected company.

Individual and team assignments serve the in-depth understanding of most crucial and debated corporate sustainability and CSR issues. Team assignments covers a presentation (in groups of 2–3 students), related to the project and case studies.

Students are expected to be continuously present during the course and actively participate in discussions – their oral performance is evaluated and integrated into the grading procedure.

Study activity	Minimum requirement for the course completion (if any)	Weighting of student activity in the final assessment (%)
Individual assignments (related to the project)	Individual assignments related to the project	**20 %**
Group assignments (related to the project)	Minor subtasks related to the project	**20 %**
Group assignment: Presentation of 15–20 min, and essay (max. 10 pages), prepared *by teams* of 2–3 students each	Evaluation criteria are clarity of presentation, methodology, quality of data, analytical depth and critical assessment. *Each group member* should be part of the presentation; point is given for the group performance in total. There is no differentiation in points within the group.	**30 %**
Active participation	Evaluation of the challenges/week Individual assignments related to the project	10 %
Self reflection		20 %

5. Compulsory readings

Compulsory reading	URL
Carroll A. B (1999): Corporate Social Responsibility – Evolution of a definitional construction, Business and Society, 38 (3), 268-295	
Crane, A., Palazzo., G, Spence, L.J., Matten, D. (2014): Contesting the Value of "Creating Shared Value", California Management Review, 56 (2), 130-153	

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Compulsory reading	URL
Dyllick, Thomas – Hockerts, Kai (2002): Beyond the Business Case for Corporate Sustainability, Business Strategy and the Environment 11, pp 130–141.	
Important documents for CSR: EU Green Paper on CSR, UN Global Compact, ISO 26 000, the renewed EU-strategy 2011–2014 for CSR	
Important documents for Sustainability: Sustainability Reporting Guidelines of GRI, Dow Jones Indices, AccountAbility	
Latapí Agudelo, M. A., Jóhannsdóttir, L., & Davídsdóttir, B. (2019). A literature review of the history and evolution of corporate social responsibility. *International Journal of Corporate Social Responsibility*, *4* (1), 1–23.	
Latapí Agudelo, M.A., Jóhannsdóttir, L. & Davídsdóttir, B. A literature review of the history and evolution of corporate social responsibility. *Int J Corporate Soc Responsibility* **4,** 1 (2019). https://doi.org/10.1186/s40991-018-0039-y	
Lock, I. and Seele, P. (2017), "Measuring credibility perceptions in CSR communication: a scale development to test readers' perceived credibility of CSR reports", Management Communication Quarterly, Vol. 31 No. 4, pp. 584-613	
McWilliams, A. – Siegel, D.S. – Wright, P.M. (2006): Corporate Social Responsibility: Strategic Implications. Journal of Management Studies. Vol. 43:1, pp. 1–18.	
Mikołaj Ślęzak: From Traditional to Strategic CSR: Systematic Literature Review, Journal of Corporate Responsibility and Leadership, 7 (1), 39–53., https://doi.org/10.12775/JCRL.2020.003	
Miska, C., Mendenhall, M. E. (2015): Responsible Leadership: A Mapping of Extant Research and Future Directions, Journal of Business Ethics, 125 (2): 349-360	
Porter, M. – Kramer, M. (2011):Creating Shared Value, Harvard Business Review, January–February, 1-17	
Rendtorff, J.D. (2019), "The Principle of Responsibility: Rethinking CSR as SDG Management", *Philosophy of Management and Sustainability: Rethinking Business Ethics and Social Responsibility in Sustainable Development*, Emerald Publishing Limited, Bingley, pp. 205–220. https://doi.org/10.1108/978-1-78973-453-920191016	
Report by the Stiglitz Commission on the Measurement of Economic Performance and Social Progress (2009), www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf	
Schönherr, N., Findler, F. and Martinuzzi, A. (2017): Exploring the Interface of CSR and the Sustainable Development Goals, Transnational Corporations, 29,3, 33-47	
Slaper, T.F., Tanya, J. (2011): The Triple Bottom Line: What Is It and How Does It Work? Indiana Business Review, 86 (1), http://www.ibrc.indiana.edu/ibr/2011/spring/article2.html	
Velte, P. (2022). Meta-analyses on corporate social responsibility (CSR): a literature review. *Management Review Quarterly*, *72* (3), 627–675.	

6. Recommended readings

Recommended reading	URL
Aakhus, M., Bzdak, M. (2012): Revisiting the Role of "Shared Value" in the Business-Society Relationship, Busoness and Professional Ethics Journak, 31 (2), 231-246	
Bendell, J. (2010): Ethical Indices, World Review, The Journal of Corporate Citizenship (Winter), Greenleaf Publishing, 6-25	
Beschorner T. (2013): Creating Shared Value: The one-trick pony approach, Business Ethics Journal Review, 1 (17), 106-112	
Branco, M., Rodtigues, L. (2006): Corporate Social Responsibility and Resource-Based Perspectives, Journal of Business Ethics, 69 (2), 111-132	
Denning, S. (2011): Why 'Shared Value' Can't Fix Capitalism, Forbes, December 20, 2011	
Dyllick, T. (2014): The Opposing Perspectives on Creating Shared Values, Financial Times, April 24, 2014	
Fassin, Yves (2005): The Reasons behind Non-ethical Behaviour in Business and Entrepreneurship, Journal of Business Ethics, 60, pp. 265–279	
Garriga, E., Melé, D. (2004): Corporate social responsibility theories: mapping the territory, Journal of Business Ethics, 53 (1), 51-71	
Karnani A. (2010): Doing Well by Doing Good: The Grand Illusion, California Management Review, 53 (2), 69-86	
KPMG (2015): Currents of Change: The KPMG Survey of Corporate Sustainability Reporting	
Mackey, J., Sinodia R. (2013): Conscious Capitalism: Liberating the Heroic Spirit of Business, Harvard Business Review, Press, 1st Edition, New York	
Miska, C., Hilbe, C., Mayer S. (2014): Reconciling Different Views on Responsible Leadership: A Rationality-Based Approach, Journal of Business Ethics, 125 (1): 349–360 sharedvalue.org	
Vogel, D. J. (2005): Is There a Market for Virtue? The Business Case for Corporate Social Responsibility, California Management Review, 47 (4), 19-45	
Zsóka Á., Vajkai É., (2018): Corporate sustainability reporting: Scrutinising the requirements of comparability, transparency and reflection of sustainability performance, Society and Economy 40, 1, 19-41	

7. Thematic weekly schedule

Week no.	Brief description of topic
1	1. **Introduction**. Content and approach of the course. The relevance of corporate sustainability and CSR, based on challenges of the rapidly changing environmental, social and business circumstances.
	2. Sustainability versus CSR
2	1. **Perspectives of corporate social responsibility**
	2. **Global context** for sustainability and related exercise in class (SDG goals).
3	1. **Management theories** and sustainability. Economic fundamentalism, stakeholder approach, normative theories.1.
	2. **Gender equalities**
4	**1–2. Community partner visit**
5	**1. Corporate strategy and CSR. Philanthropy, sponsorship. Value creation with CSR**
	2. Sustainability at Unilever – Guest lecture of Zsófia Molnár, Brand manager of Dove, tbd
6	**1. Carrol pyramid, The fashion industry and sustainability**
	2. Corporate responsibility at Procter and Gamble –Guest lecture of Vivien Klem and Yvette Krubl, tbd
7	**Week Autumn Holiday (no classes)**

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Week no.	Brief description of topic
8	1. **Environmental aspects of CSR**. **2. Sustainability at Decathlon – Guest lecture of Ildikó Kovács, tbd**
9	1. **Internal and external social aspects of CSR**. **2. Consultation with the community partner**
10	**1. Relationship between CSR and marketing tools (model of Kotler and Lee)** 2. **Confrontation or cooperation**? Relationship of companies and NGOs **Contribution of Ludwig Museum to the debate, tbd**
11	**1. CSR communication strategies** **2. CSR communication tools**
12	**1. Reporting: The experience of KPMG on non-financial reporting – Guest presentation of Éva Kerekes, advisor of KPMG, tbd** **2. Discussion based on the individual assignment on sustainability reporting**
13	**1–2. Student presentation of the project**
14	**1.** Student presentation related to the ***Pro Bono project*** **2. Critics of and future path for** corporate sustainability and CSR

8. Class data

Course code	Course type	Lecturer(s)	Time and venue

9. Prerequisites and further information

Description of prerequisites and further information
–

10. Class participation

Not to be confused with attendance, class participation is the practice of engaging your professor and fellow students during presentations and discussions with thoughtful and timely contributions. If you miss classes it will have an impact on your participation points!

Opinions vary, civility is constant. You should feel free to question or disagree with other students; however, such disagreement must be based on the idea and not the person. Respect for your peers and professor is the sine qua non of great discussions and great learning experiences.

DO NOTE THAT EVERY POINT IS EARNED, NOT NEGOTIATED!

11. Plagiarism

Any and all statements contained in any assignment or paper that are based upon ideas or words of another must be properly credited to the original author or source. Paraphrasing the ideas or words of another is acceptable so long as the original author or source is cited. DO NOT quote words or expressions from existing works verbatim without designating the passage as a quote and crediting the source. Any student who plagiarizes the work of any other person (author, professor, student, parent, friend, etc.) is committing academic dishonesty and misconduct. Any student caught committing plagiarism will automatically fail the course.

Data availability

The data that has been used is confidential.

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