



DISC Work Package 2 DISC Survey and Focus Groups Report



Co-funded by the European Union

CC 0 BY SA The creation of these resources has been (partially) funded by the ERASMUS+ grant program of the European Union under grant no. 2022-1-DE01-KA220-HED-000087131. Neither the European Commission nor the project's national funding agency DAAD are responsible for the content or liable for any losses or damage resulting of the use of these resources.

The materials are published under Creative Commons Attribution-ShareAlike 4.0 International License and has been created as a part of the project DISC, funded by the European Union under the Erasmus+ Programme, under the contract number: 2022-1-DE01-KA220-HED-000087131 coordinated by University Duisburg-Essen.















Executive summary

The primary objective of the DISC initiative is to promote the advancement and authentication of sustainability proficiencies within the academic community, specifically targeting educators and students enrolled in Higher Education Institutes (HEI) across Europe. The proposed approach involves the integration of sustainable development (SD) materials and learning modules within study modules in a participatory setting. Additionally, a transferrable learning program will be developed, which aligns with the United Nations Sustainable Development Goals (SDGs) and incorporates Design Based Collaborative Learning, including blended learning methodologies. Furthermore, it provides Continuing Professional Development (CPD) prospects for higher education personnel to augment their proficiencies in the field of sustainability and in cutting-edge approaches for facilitation and validation.

The DISC project shows the results of a survey done around Europe to collect noteworthy instances of sustainable development education that utilize a constructive, integrated (digitally enabled), and innovative pedagogical approach. The aforementioned instances are incorporated inside this document. It is imperative for WP2 to gain insights from the achievements and shortcomings of analogous programs and initiatives, as this obviates the necessity of duplicating efforts. It functions as the fundamental basis for the networking in Work Package 5, as well as the accessible repository of suggested online courses, modules, and practical projects in Work Package 4. Furthermore, the research findings will be subjected to analysis and evaluation in four master's theses conducted jointly. These theses will serve the dual purpose of contributing to WP3 and providing concrete insights into collaborative design-based research. The degree to which the process of stocktaking is efficiently incorporated into other work products. The second action, deemed essential for the project's success, involves the creation of competence frameworks. These frameworks serve as a theoretical basis for the SD literacy approach, benefiting both the students and facilitators involved. The learning method, which was developed in Work Package 3 (WP3), places significant emphasis on the utilization of competency frameworks. These frameworks are essential as they provide the basis for the identification and validation of facilitation and sustainable development (SD) competencies.

Moreover, the report presents an examination of the survey results and suggests that the incorporation of sustainability concepts into the academic curriculum extends beyond the mere inclusion of environmental subjects in instructional approaches. Contrarily, it concerns equipping individuals with the necessary skills to critically evaluate the interconnectedness of environmental, social, and economic factors. This empowers individuals to make choices that prioritize environmental sustainability and social responsibility. This pertains to the education and development of persons who demonstrate proactive and engaged conduct, as well as the ability to make responsible judgments. These individuals also cultivate an understanding of the challenges presented by globalization, while simultaneously promoting tolerance and diversity and fostering a harmonious environment. Furthermore, this aims to strengthen the strategies for empowering a politically engaged population capable of implementing transformative actions through direct engagement. Various efforts have been implemented by universities with the objective of promoting the integration of sustainable practices into academic activities. The previously described efforts primarily involve the





incorporation of sustainability topics into educational curriculum, the utilization of interactive teaching methods that incorporate sustainability information, and the creation of evaluation systems that encourage learning centered on sustainability. These programs require a particular sort of training and necessitate a shift in the instructors' perspective, hence contributing to their inherent complexity. Moreover, the analysis of the survey data reveals challenges that emerge in relation to educators' comprehension of the notion of "incorporating sustainability into the curriculum" and its implementation across many disciplines, regardless of the specific academic field. The successful execution of this attempt necessitates the incorporation of a practical application that demonstrates both innovation and interdisciplinarity. Despite possessing a theoretical comprehension of this integration, educators encounter challenges when attempting to implement it in practical settings. The inclusion of sustainability in the curriculum, the provision of adequate training for educators, and the integration of comprehensive perspectives on sustainability in pedagogical practices are all crucial elements that impact the viability of incorporating sustainability within the university setting.





Content list

1	Introduction to the report	6
2	The Survey	12
2.1	Education for Sustainable Development Teaching and Learning	12
2.2	Prerequisites for Education for Sustainable Development	18
2.3	Learning Outcomes	33
2.4	Teaching and learning approaches	45
2.5	Discussion	61
3	Content Analysis of Student Interviews and Focus Groups on Education	71
	for Sustainable Development (ESD)	
3.1	Conceptual Familiarity and Interpretations of ESD	71
3.2	Skills and Competences for Sustainable Futures	71
3.3	Pedagogical Approaches and Project-Based Learning	72
3.4	Perceived Role of ESD in Curriculum and Institutions	72
3.5	ESD as Ethical, Political, and Cultural Practice	72
3.6	Assessment of Learning Outcomes and Methodological Innovation	73
3.7	Barriers and Tensions	73
3.8	Comparative and Contextual Reflections	73
3.9	Implications	74
4	Content Analysis of Teaching Staff Interviews and Focus Groups on	75
	Education for Sustainable Development (ESD)	
4.1	Understanding and Familiarity with ESD	75
4.2	Institutional Integration of ESD	75
4.3	Pedagogical Practices and Methodologies	76
4.4	Assessment of ESD Learning Outcomes	77
4.5	Challenges and Structural Constraints	77
4.6	Examples of ESD-Oriented Programs and Innovations	78
4.7	Knowledge, Skills, and Attitudes in ESD	78
4.8	Implications and Recommendations	79
5	Short comparative report from the focus-groups analysis on Education	80
	for Sustainable Development (ESD)	
5.1	Introduction	80
5.2	Methodology	80
5.3	Understanding and Familiarity with ESD	80
5.4	Institutional Integration of ESD	81
5.5	Pedagogical Approaches	81
5.6	Assessment Practices	81
5.7	Competency Development	82
5.8	Challenges and Tensions	82
5.9	Comparative Analysis	82
5.10	Recommendations	82
5.11	Conclusion	83
6	References	84
7	ANNEX	88
7.1	WP2 stocktaking questionnaire (consolidated version)	88

4



- 7.2 WP2 focus groups with students (guide)
- 7.3 WP2 focus groups with teaching staff (guide)





DISC

Developing Innopreneurship, Sustainability and Culture



1. INTRODUCTION TO THE REPORT

In recent years, universities have engaged in a range of activities with varied levels of success and challenges in their pursuit of sustainability. Several key responsibilities in this endeavor encompass environmental management, descriptive case studies, exemplification of optimal approaches, the incorporation of sustainability principles into particular courses, theoretical advancement in teaching and learning centered on sustainability, and the examination of university policies, among other tasks. A higher education institution that adopts a comprehensive approach to sustainability incorporates sustainability principles across various aspects of its organizational structure. These aspects are typically categorized into five main domains: governance (such as mission statements and strategic planning), campus operations (including food procurement and greenhouse gas emissions), research (encompassing the focus of research centers and sustainability innovations), community outreach (involving partnerships with local communities), and education (encompassing curriculum and pedagogy). Higher education institutions (HEIs) possess a multitude of options to actively participate in and promote sustainable advancements in human society. Therefore, the integration of sustainability as a cross-cutting principle in teaching, research, operations, and knowledge transfer can enable them to play a significant role in advancing sustainable development (SD) (Sterling, 2013). In light of the aforementioned circumstances, what strategies may colleges employ to effectively implement their commitment to sustainability? Moore (2001) asserts that the initial step is envisioning the characteristics of a "sustainable" university, encompassing the conception of educational curricula centered on sustainability and the establishment of sustainable communities inside the university. Sustainability encompasses a multifaceted framework that encompasses the ideals of social justice, ecological integrity, and the overall well-being of all living systems within the global ecosystem. Therefore, embarking on the path towards sustainability within the university necessitates the initial step of empowering the university community. Additionally, it involves the establishment of platforms for introspection and fostering collective, interdisciplinary, and transdisciplinary collaboration. The integration of sustainability into higher education presents a novel challenge to the academic system, as it strives to establish itself as a burgeoning area of research.

Currently, the majority of higher education institutions (HEIs) continue to support a system that prioritizes economic expansion while disregarding the ecological constraints of our planet (Fazey et al., 2020). Frequently, students are not afforded the sufficient opportunity to effectively engage with global challenges within their academic pursuits. Alternatively, they may solely encounter information pertaining to the origins and progression of the climate crisis, such as in lectures or comparable settings, which fails to facilitate a transformative learning experience (Singer-Brodowski et al., 2019). However, in order to address global concerns effectively, it is imperative to provide individuals with the necessary tools and skills to engage in holistic and future-oriented thinking, as well as to actively participate in resolving intricate societal issues (Orr, 1991; Glasser, 2005; de Haan, 2010; Fadeeva and Mochizuki, 2010; Rieckmann, 2012; Brundiers et al., 2021). In addition to their traditional roles in teaching and research, higher education institutions (HEIs) have the potential to serve as platforms for co-creation and cooperation. By bringing together individuals and institutions from diverse scientific and societal backgrounds, HEIs may solve the growing complexity of real-life challenges (Giesenbauer & Müller-Christ, 2020).



DISC

DISC Developing Innopreneurship, Sustainability and Culture

There is a prevalent argument that the normative nature of sustainability science is at odds with the conventional positivist theory of science and the principle of research independence. Vogt and Weber (2020) counter this thesis by asserting that scientists have an active role in driving societal change from the outset, as they commence generating ideas and engaging in discourses. According to Vogt and Weber (2020), the responsibility lies with them to contemplate and analyze this particular circumstance (p. 17). By engaging in this process, individuals may develop an understanding of the obligations they bear as representatives of marginalized groups, assuming the role of advocating for those who lack influence within systems of authority (Vogt & Weber, 2020). In summary, this paradigm shift implies that science bears a moral responsibility to actively participate in sustainable development or, at the very least, abstain from endorsing practices that are detrimental to sustainability, as it is widely acknowledged that research devoid of values is both unattainable and undesirable (Vogt and Weber, 2020).

Lozano et al. (2015) have established a correlation between a HEI's public commitment to sustainable development (SD) and its implementation of SD. However, it is important to acknowledge that the path towards implementation is not without its challenges. Higher education institutions (HEIs) are intricate organizational entities that are resistant to immediate reform. However, the phenomenon of change is accompanied by intricate learning mechanisms among individuals throughout different sectors of the organization. Collectively, these factors indicate that higher education institutions (HEIs) experience extensive transformative procedures during which well-established and validated practices, as well as objectives and procedures, are subject to scrutiny and adjustment. During this process, it is inevitable that the interests and rationales of various higher education institution (HEI) pursuing sustainability can be considered as engaging in a learning process. Consequently, such an institution can be viewed as a hub for education focused on sustainable development.

In order to facilitate the development of this potential, it is imperative to take into account certain crucial external circumstances. Currently, the existing higher education system appears to lack the necessary preparedness to effectively facilitate the educational requirements of inter- and transdisciplinary teaching and learning environments, as advocated for by the field of education for sustainability (Singer-Brodowski et al., 2019). This assertion holds true in relation to research, the dissemination of knowledge, and the functioning of the university campus. In general, numerous Higher Education Institutions (HEIs) perceive themselves as being dedicated to conflicting rationales that hinder their ability to fulfill the fundamental prerequisites for effectively contributing to Sustainable Development (SD). Individuals are faced with a wide range of obligations and obstacles, including the processes of internationalization, digitization, and marketization (Altbach, 2008; Giesenbauer and Tegeler, 2020). In contrast, policymakers have failed to establish a discernible framework for task prioritization or offer any incentives to facilitate such prioritization, despite the existence of numerous non-binding agreements and declarations pertaining to sustainable development in higher education institutions (HEIs) at different levels of governance (Adomßent and Michelsen, 2006; Michelsen, 2016; Singer-Brodowski et al., 2018). However, the pursuit of scientific excellence hinders participating Higher Education Institutions (HEIs) from undertaking alternate endeavors. One example that highlights the prevailing preference for mono-disciplinary research over innovative citizen



Co-funded by the European Union

DISC



Developing Innopreneurship, Sustainability and Culture

science may be observed in the present funding programs, where mono-disciplinary research is consistently given higher priority and value. Modifications to funding mechanisms have the potential to address various shortcomings of higher education institutions (HEIs) in terms of knowledge exchange with external stakeholders in society, as emphasized in previous studies (Zilahy and Huisingh, 2009; Trencher et al., 2014; Leal Filho et al., 2019). Consequently, such adjustments could also enhance the fulfillment of the third mission.

Nevertheless, the matters of prioritization and funding can be addressed by higher education institutions (HEIs) on an individual basis, in accordance with their respective agendas. As previously mentioned, the successful implementation of sustainable development necessitates well-thought-out conceptualizations and frameworks for sustainable development. The permanent availability of resources by higher education institution (HEI) administration can serve as a significant declaration and enable a comprehensive process of progress towards sustainable development (SD). Certain higher education institutions (HEIs) have successfully established rigorous criteria for sustainable development (SD), capitalizing on this chance to emerge as prominent advocates for sustainability. Consequently, these institutions have gained significant appeal among both students and staff members. Insufficient quantities of beacons do not adequately fulfill the intended purpose, however, the elimination of this distinct benefit occurs as the quantities increase. It is imperative to go beyond the tipping point towards an educational institution (HEI) environment in which the absence of sustainability renders a HEI unappealing.

It is therefore imperative to emphasize that higher education institutions (HEIs) must undergo a profound metamorphosis, prioritizing the concepts of accountability and sustainability. Higher education institutions (HEIs) should perceive themselves as experimental spaces wherein students acquire the skills to critically analyze societal circumstances, generate innovative concepts for a more desirable future, and effectively execute sustainable resolutions. By adopting this approach, higher education institutions (HEIs) will be able to make a concrete and significant impact on the overall welfare of humanity.

It is in the above context that the DISC project aims to enhance competency development and validation in the field of sustainability literacy, as well as facilitate its integration among students and educators at European Higher Education Institutes (HEI). The organization is engaged in the development of a transferrable learning program that is based on the United Nations Sustainable Development Goals (SDGs) and incorporates Design Based Collaborative Learning, including Blended Learning. This program aims to provide Continuing Professional Development for higher education staff, focusing on competence development in the areas of sustainability and innovative facilitation and validation methodologies. Additionally, the program seeks to integrate SD content and learning modules into study modules at participating higher education institutions. Pilot projects will be conducted to implement these sustainability learning programs in both businesses (with a focus on SD management) and local SD initiatives (with a focus on sustainability literacy and Sustainable Development projects). Furthermore, the organization aims to expand European mobility opportunities, particularly for different learner groups in higher education. Lastly, the organization plans to develop and deliver innovative digital study modules to promote collaborative international and interdisciplinary learning designs.





The DISC project hereby provides the findings of a comprehensive survey conducted across Europe, aimed at gathering exemplary instances of sustainable development education that adhere to an inventive, digitally assisted, and constructive pedagogical approach. In the context of WP2, it is imperative to consider the significance of incorporating good practices and drawing from the experiences of comparable projects and initiatives. This approach allows for the avoidance of redundant efforts and facilitates the acquisition of knowledge from others. The establishment of a foundation is crucial for the creation of an accessible database containing outstanding online courses, modules, and practice projects in WP4. Additionally, it serves as a fundamental component for fostering connections and collaborations in WP5. In addition to this, the research findings will be analyzed and assessed through the completion of four collaborative master theses. These theses will simultaneously integrate with WP3 and provide practical insights into design-based research. The stocktaking process demonstrates a strong connection to other work packages. The construction of competence frameworks constitutes a crucial component of the SD literacy method, serving as the theoretical foundation for both students and facilitators. Consequently, it holds significant importance for the overall success of the project. The learning method, which was created in Work Package 3 (WP3), relies on the utilization of competence frameworks since they serve as the foundation for both the planning and validation of sustainable development (SD) skills and facilitation competences. Furthermore, project offers a fertile ground for investigating how university students across Europe perceive, engage with, and critically reflect on Education for Sustainable Development (ESD). Drawing from a qualitative dataset comprising focus groups and interview transcripts from Greece, Germany, Portugal, and Italy, this content analysis identifies and synthesizes core themes that illuminate student perspectives on ESD integration, pedagogical approaches, learning outcomes, and critical reflections on sustainability as an educational and ideological construct. In addition, By examining interview and focus group data from faculty members across multiple institutions, this report captures how ESD is interpreted, operationalized, and challenged in higher education teaching. The findings present a complex yet promising landscape, where enthusiasm, critical reflection, and pragmatic institutional critique converge.

Recent studies conducted on Sustainable Development Education in Higher Education Institutions (HEIs) indicate that the integration of the Sustainable Development Goals (SDGs) into university curricula and practices is still in its early stages. The implementation of the Sustainable Development Goals (SDGs) has the potential to enhance the ability of universities to establish stronger connections with external stakeholders and society at large. The incorporation of the Sustainable Development Goals (SDGs) into teaching can potentially lead to increased student engagement. There is a need for more systematic endeavors to enhance the integration of the Sustainable Development Goals (SDGs) within higher education institutions. According to Filho et al. (2019), In order to attain the Sustainable Development (SD) goals, Higher Education Institutions (HEIs) must engage in the development of novel Teaching, Learning, and Research formats that emphasize collaboration and design-driven approaches. Additionally, HEIs must actively address the principles of sustainable development within their own communities. Higher education institutions (HEIs) have emerged as key catalysts for sustainable development (SD) at the local and regional levels. In order to achieve success, it is imperative for individuals or organizations to make significant contributions towards the advancement of social,



economic, and cultural aspects within the regions where they are active. This may be accomplished through the dissemination of knowledge and technologies to both industry and society as a whole (Compagnucci et al., 2020).

In addition to the latest results in the literature, the partners themselves have recognized specific requirements pertaining to education for sustainable development within their initiatives and networks. The Aurora Alliance emerged in 2016 as a collaborative coalition including nine prestigious, research-focused universities within the European Union. Its primary objective was to identify and articulate the specific requirements of students and staff members at universities with respect to sustainability and sustainability education. Additionally, the ECON research project has been investigating the special requirements of vocational education and training (VET) students with regards to education related to the Sustainable Development Goals (SDGs). Furthermore, the partners have undertaken various past and ongoing projects that involve in-depth analysis of the demands of students, teaching staff, the business sector, and civic society partners. These projects specifically focus on aspects such as innovative, learner-centered, and business-oriented sustainable development (CIM, PITCH), and collaborative learning through computer-supported collaborative learning and design-based approaches (VIVA, DEAL, DATALIT).





2. THE SURVEY

The DISC survey aimed at the collection of available approaches in HE and VET in which Sustainability Education follows a holistic, competence-oriented approach aiming at sustainability literacy and culture. It also aimed at collecting available OER in this sector; not only materials but also platforms and apps which can be later made available in the DISC platform, as well as some determined future occupational profiles with a connection to ECVET and curricula.

In total, there were 202 respondents from 20 countries, the majority of which were students (42,5%), with teachers and trainers summing to 37%. Most respondents were coming from the fields of education and social sciences, the majority of which were representing the age group 15-30 (40,1%), with average familiarity with the concept of 'Education for Sustainable Development' totaling to 60,6%.

What follows is a descriptive analysis of the major results of the survey with short presentation of the questions answered.





2.1 Education for Sustainable Development Teaching and Learning

Students and teaching staff must understand and be able to apply the basic concepts and principles of sustainability

The participants answered whether they believe that Students and teaching staff must understand and be able to apply the basic concepts and principles of sustainability. Most participants answered that they totally agree 5/5 (57.63%), while 32.20% answered that they largely agree (4/5).

Table 1: Students and teaching staff must understand and be able to apply the basic concepts and principles of sustainability

	Frequency	Percent (%)	Total
1	0	0.00%	0.85%
2	1	0.85%	
3	11	9.32%	9.32%
4	38	32.20%	
5	68	57.63%	89.83%
No reply	4	1.98%	0.00%
Missing	80	39.60%	0.00%
Mean	4.47		
Standard Deviation	0.7		
Total (answers)	118	100.00%	100.00%

Graph 1: Students and teaching staff must understand and be able to apply the basic concepts and principles of sustainability







For sustainability education to be effective, teaching staff must provide students with a foundational understanding of sustainability

The participants answered whether they believe that for sustainability education to be effective, teaching staff must provide students with a foundational understanding of sustainability. Most participants answered that they totally agree 5/5 (59.32%), while 29.66% answered that they largely agree (4/5).

	Frequency	Percent (%)	Total
1	0	0.00%	0.00%
2	0	0.00%	
3	13	11.02%	11.02%
4	35	29.66%	
5	70	59.32%	88.98%
No reply	4	1.98%	0.00%
Missing	80	39.60%	0.00%
Mean	4.48		
Standard Deviation	0.69		
Total (answers)	118	100.00%	100.00%

Table 2: For sustainability education to be effective, teaching staff must provide studentswith a foundational understanding of sustainability

Graph 2: For sustainability education to be effective, teaching staff must provide students with a foundational understanding of sustainability







Students and teaching staff must understand the relationship among economic, environmental and social factors in order to make informed decisions and take individual and collective action to improve living conditions on the planet

The participants answered whether they believe that students and teaching staff must understand the relationship among economic, environmental and social factors in order to make informed decisions and take individual and collective action to improve living conditions on the planet. Most participants answered that they totally agree 5/5 (57.98%), while 32.77% answered that they largely agree (4/5).

	Frequency	Percent (%)	Total
1	0	0.00%	2.52%
2	3	2.52%	
3	8	6.72%	6.72%
4	39	32.77%	
5	69	57.98%	90.76%
No reply	3	1.49%	0.00%
Missing	80	39.60%	0.00%
Mean	4.46		
Standard Deviation	0.73		
Total (answers)	119	100.00%	100.00%

Table 3: Students and teaching staff must understand the relationship among economic, environmental and social factors in order to make informed decisions and take individual and collective action to improve living conditions on the planet

Graph 3: Students and teaching staff must understand the relationship among economic, environmental and social factors in order to make informed decisions and take individual and collective action to improve living conditions on the planet







Students and teaching staff must recognize sustainability as an interdependent condition of ecological, economic and social systems

The participants answered whether they believe that Students and teaching staff must recognize sustainability as an interdependent condition of ecological, economic and social systems. Most participants answered that they totally agree 5/5 (49.58%), while 32.77% answered that they largely agree (4/5).

Table 4: Students and teaching staff must recognize sustainability as an interdependent
condition of ecological, economic and social systems

	Frequency	Percent (%)	Total
1	0	0.00%	1.68%
2	2	1.68%	
3	19	15.97%	15.97%
4	39	32.77%	
5	59	49.58%	82.35%
No reply	3	1.49%	0.00%
Missing	80	39.60%	0.00%
Mean	4.3		
Standard Deviation	0.8		
Total (answers)	119	100.00%	100.00%

Graph 4: Students and teaching staff must recognize sustainability as an interdependent condition of ecological, economic and social systems





Teaching staff need to harness innovation and creativity to help students comprehend the complexities of the living environment

The participants answered whether they believe that teaching staff need to harness innovation and creativity to help students comprehend the complexities of the living environment. Most participants answered that they totally agree 5/5 (45.38%), while 42.02% answered that they largely agree (4/5).

	Frequency	Percent (%)	Total
1	0	0.00%	3.36%
2	4	3.36%	
3	11	9.24%	9.24%
4	50	42.02%	
5	54	45.38%	87.39%
No reply	3	1.49%	0.00%
Missing	80	39.60%	0.00%
Mean	4.29		
Standard Deviation	0.77		
Total (answers)	119	100.00%	100.00%

Table 5: Teaching staff need to harness innovation and creativity to help studentscomprehend the complexities of the living environment

Graph 5: Teaching staff need to harness innovation and creativity to help students comprehend the complexities of the living environment





Students and teaching staff must develop a multidisciplinary approach to learning the knowledge, skills and attitudes necessary to continuously improve the health and well-being of present and future generations

The participants answered whether they believe that students and teaching staff must develop a multidisciplinary approach to learning the knowledge, skills and attitudes necessary to continuously improve the health and well-being of present and future generations. Most participants answered that they totally agree 5/5 (58.82%), while 29.41% answered that they largely agree (4/5).

being of present and fature generations			
	Frequency	Percent (%)	Total
1	0	0.00%	2.52%
2	3	2.52%	
3	11	9.24%	9.24%
4	35	29.41%	
5	70	58.82%	88.24%
No reply	3	1.49%	0.00%
Missing	80	39.60%	0.00%
Mean	4.45		
Standard Deviation	0.77		
Total (answers)	119	100.00%	100.00%

Table 6: Students and teaching staff must develop a multidisciplinary approach to learningthe knowledge, skills and attitudes necessary to continuously improve the health and well-being of present and future generations

Graph 6: Students and teaching staff must develop a multidisciplinary approach to learning the knowledge, skills and attitudes necessary to continuously improve the health and well-being of present and future generations





2.2 Prerequisites for Education for Sustainable Development

Recognize and understand relationships

Most participants answered that the 'Recognize and understand relationships' is largely relevant 4/5 (40.52%), while 34.48% answered that it is very relevant (5/5).

	Frequency	Percent (%)	Total
1	0	0.00%	6.90%
2	8	6.90%	
3	21	18.10%	18.10%
4	47	40.52%	
5	40	34.48%	75.00%
No reply	6	2.97%	0.00%
Missing	80	39.60%	0.00%
Mean	4.03		
Standard Deviation	0.9		
Total (answers)	116	100.00%	100.00%

Table 7: Recognize and understand relationships



Graph 7: Recognize and understand relationships





Analyze complex systems and their relationship with different domains and scales

Most participants answered that 'Analyze complex systems and their relationship with different domains and scales' is largely relevant 4/5 (41.38%), while 39.66% answered that it is very relevant (5/5).

	Frequency	Percent (%)	Total
1	0	0.00%	3.45%
2	4	3.45%	
3	18	15.52%	15.52%
4	48	41.38%	
5	46	39.66%	81.03%
No reply	6	2.97%	0.00%
Missing	80	39.60%	0.00%
Mean	4.17		
Standard Deviation	0.82		
Total (answers)	116	100.00%	100.00%

Table 8: Analyze complex systems and their relationship with different domains and scales

Graph 8: Analyze complex systems and their relationship with different domains and scales







Deal with uncertainty

Most participants answered that the 'Deal with uncertainty' is largely relevant 4/5 (37.93%), while 32.76% answered that it is very relevant (5/5).

	Frequency	Percent (%)	Total
1	4	3.45%	12.07%
2	10	8.62%	
3	20	17.24%	17.24%
4	44	37.93%	
5	38	32.76%	70.69%
No reply	6	2.97%	0.00%
Missing	80	39.60%	0.00%
Mean	3.88		
Standard Deviation	1.07		
Total (answers)	116	100.00%	100.00%

Table 9: Deal with uncertainty



Graph 9: Deal with uncertainty





Understand, evaluate and create several futures (possible, probable, and desirable)

Most participants answered that the 'Understand, evaluate and create several futures (possible, probable, and desirable)' is largely relevant 4/5 (40.00%), while 31.30% answered that it is very relevant (5/5).

Table 10: Understand, evaluate and create several futures (possible, probable, and desirable)

	Frequency	Percent	Total
		(%)	
1	4	3.48%	9.57%
2	7	6.09%	
3	22	19.13%	19.13%
4	46	40.00%	
5	36	31.30%	71.30%
No reply	7	3.47%	0.00%
Missing	80	39.60%	0.00%
Mean	3.9		
Standard Deviation	1.03		
Total (answers)	115	100.00%	100.00%

Graph 10: Understand, evaluate and create several futures (possible, probable, and desirable)







Apply the principle of precaution

Most participants answered that the 'Apply the principle of precaution' is very relevant (5/5) (30.70%), while, with the same percentage (30.70%) answered that it is largely relevant 4/5.

	Frequency	Percent (%)	Total
1	5	4.39%	9.65%
2	6	5.26%	
3	33	28.95%	28.95%
4	35	30.70%	
5	35	30.70%	61.40%
No reply	8	3.96%	0.00%
Missing	80	39.60%	0.00%
Mean	3.78		
Standard Deviation	1.08		
Total (answers)	114	100.00%	100.00%

Table 11: Apply the principle of precaution



Graph 11: Apply the principle of precaution





Assess the consequences of actions

Most participants answered that 'Assess the consequences of actions' is very relevant (5/5) (45.69%), while 37.07% answered that it is largely relevant 4/5.

	Frequency	Percent	Total
		(%)	
1	1	0.86%	2.59%
2	2	1.72%	
3	17	14.66%	14.66%
4	43	37.07%	
5	53	45.69%	82.76%
No reply	6	2.97%	0.00%
Missing	80	39.60%	0.00%
Mean	4.25		
Standard Deviation	0.83		
Total (answers)	116	100.00%	100.00%

Table 12: Assess the consequences of actions









Deal with risk and change

Most participants answered that the 'Deal with risk and change' is very relevant (5/5) (42.24%), while 37.93% answered that it is largely relevant 4/5.

	Frequency	Percent (%)	Total
1	1	0.86%	2.59%
2	2	1.72%	
3	20	17.24%	17.24%
4	44	37.93%	
5	49	42.24%	80.17%
No reply	6	2.97%	0.00%
Missing	80	39.60%	0.00%
Mean	4.19		
Standard Deviation	0.84		
Total (answers)	116	100.00%	100.00%

Graph 13: Deal with risk and change







Understand and reflect on the norms and values that underlie people's actions

Most participants answered that the 'Understand and reflect on the norms and values that underlie people's actions' is very relevant (5/5) (46.55%), while 32.76% answered that it is largely relevant 4/5.

	Frequency	Percent (%)	Total
1	2	1.72%	3.45%
2	2	1.72%	
3	20	17.24%	17.24%
4	38	32.76%	
5	54	46.55%	79.31%
No reply	6	2.97%	0.00%
Missing	80	39.60%	0.00%
Mean	4.21		
Standard Deviation	0.91		
Total (answers)	116	100.00%	100.00%

Table 14: Understand and reflect on the norms and values that underlie people's actions

Graph 14: Understand and reflect on the norms and values that underlie people's actions







Negotiate sustainability values, principles, goals and targets (in contexts of conflicts of interest and concessions)

Most participants answered that 'Negotiate sustainability values, principles, goals and targets (in contexts of conflicts of interest and concessions)' is very relevant (5/5) (37.93%), while 31.90% answered that it is largely relevant 4/5.

Table 15: Negotiate sustainability values, principles, goals and targets (in contexts of conflicts of interest and concessions)

	Frequency	Percent (%)	Total
1	6	5.17%	8.62%
2	4	3.45%	
3	25	21.55%	21.55%
4	37	31.90%	
5	44	37.93%	69.83%
No reply	6	2.97%	0.00%
Missing	80	39.60%	0.00%
Mean	3.94		
Standard Deviation	1.1		
Total (answers)	116	100.00%	100.00%

Graph 15: Negotiate sustainability values, principles, goals and targets (in contexts of conflicts of interest and concessions)







Collectively develop and implement innovative actions that promote sustainability (locally and in wider contexts)

Most participants answered that the 'Collectively develop and implement innovative actions that promote sustainability (locally and in wider contexts)' is very relevant (5/5) (39.13%), while 29.57% answered that it is largely relevant 4/5.

Table 16: Collectively develop and implement innovative actions that promote sustainability (locally and in wider contexts)

	Frequency	Percent (%)	Total
1	6	5.22%	12.17%
2	8	6.96%	
3	22	19.13%	19.13%
4	34	29.57%	
5	45	39.13%	68.7
No reply	7	3.47%	0.0
Missing	80	39.60%	0.0
Mean	3.9		
Standard Deviation	1.15		
Total (answers)	115	100.00%	100.0

Graph 16: Collectively develop and implement innovative actions that promote sustainability (locally and in wider contexts)







Understand and respect other people's needs, perspectives and actions (empathy)

Most participants answered that the 'Understand and respect other people's needs, perspectives and actions (empathy)' is very relevant (5/5) (53.04%), while 30.43% answered that it is largely relevant 4/5.

Table 17: Understand and respect other people's needs, perspectives and actions(empathy)

	Frequency	Percent (%)	Total
1	1	0.87%	5.22%
2	5	4.35%	
3	13	11.3	11.3
4	35	30.43%	
5	61	53.04%	83.48%
No reply	7	3.47%	0.0
Missing	80	39.6	0.0
Mean	4.3		
Standard Deviation	0.9		
Total (answers)	115	100.0	100.0

Graph 17: Understand and respect other people's needs, perspectives and actions (empathy)"







Handle group conflicts and facilitate collaboration and participation in problem solving

Most participants answered that the 'Handle group conflicts and facilitate collaboration and participation in problem solving' is very relevant (5/5) (46.55%), while 33.62% answered that it is largely relevant 4/5.

Table 18: Handle group conflicts and facilitate collaboration and participation in problemsolving

	Frequency	Percent (%)	Total
1	1	0.86%	5.17%
2	5	4.31%	
3	17	14.66%	14.66%
4	39	33.62%	
5	54	46.55%	80.17%
No reply	6	2.97%	0.0
Missing	80	39.6	0.0
Mean	4.21		
Standard Deviation	0.91		
Total (answers)	116	100.0	100.0

Graph 18: Handle group conflicts and facilitate collaboration and participation in problem solving







Commitment to continuous learning

Most participants answered that the 'Commitment to continuous learning' is very relevant (5/5) (48.28%), while 30.17% answered that it is largely relevant 4/5.

	Frequency	Percent (%)	Total
1	1	0.86%	2.59%
2	2	1.72%	
3	22	18.97%	18.97%
4	35	30.17%	
5	56	48.28%	78.45%
No reply	6	2.97%	0.0
Missing	80	39.6	0.0
Mean	4.23		
Standard Deviation	0.88		
Total (answers)	116	100.0	100.0

Table 19: Commitment to continuous learning

Graph 19: Commitment to continuous learning







Respect for diversity

Most participants answered that the 'Respect for diversity' is very relevant (5/5) (57.76%), while 20.69% answered that it is largely relevant 4/5.

	Frequency	Percent (%)	Total
1	0	0.0	3.45%
2	4	3.45%	
3	21	18.1	18.1
4	24	20.69%	
5	67	57.76%	78.45%
No reply	6	2.97%	0.0
Missing	80	39.6	0.0
Mean	4.33		
Standard Deviation	0.89		
Total (answers)	116	100.0	100.0

Table 20: Respect for diversity

Graph 20: Respect for diversity







Building trust

Most participants answered that the 'Building trust' is very relevant (5/5) (49.57%), while 26.96% answered that it is largely relevant 4/5.

	Frequency	Percent	Total
		(%)	
1	2	1.74%	5.22%
2	4	3.48%	
3	21	18.26%	18.26%
4	31	26.96%	
5	57	49.57%	76.52%
No reply	7	3.47%	0.0
Missing	80	39.6	0.0
Mean	4.19		
Standard Deviation	0.97		
Total (answers)	115	100.0	100.0

Table 21: Building trust

Graph 21: Building trust







2.3 Learning Outcomes

Transform sustainability in personal values identify and explain how values vary among people and over time, while critically evaluating how they align with sustainability values

Most participants answered that the 'Transform sustainability in personal values identify and explain how values vary among people and over time, while critically evaluating how they align with sustainability values' is very relevant (5/5) (46.61%), while 34.75% answered that it is largely relevant 4/5.

Table 22: Transform sustainability in personal values identify and explain how values vary among people and over time, while critically evaluating how they align with sustainability values

	Frequency	Percent (%)	Total
1	1	0.85%	5.93%
2	6	5.08%	
3	15	12.71%	12.71%
4	41	34.75%	
5	55	46.61%	81.36%
No reply	4	1.98%	0.0
Missing	80	39.6	0.0
Mean	4.21		
Standard Deviation	0.91		
Total (answers)	118	100.0	100.0

Graph 22: Transform sustainability in personal values identify and explain how values vary among people and over time, while critically evaluating how they align with sustainability values



DISC - PROJECT 2022-1-DE01-KA220-HED-000087131

33





Promoting justice: To support equity and justice for current and future generations and learn from previous generations for sustainability

Most participants answered that the 'Promoting justice: To support equity and justice for current and future generations and learn from previous generations for sustainability' is very relevant (5/5) (49.15%), while 26.27% answered that it is largely relevant 4/5.

	Frequency	Percent (%)	Total
1	2	1.69%	11.02%
2	11	9.32%	
3	16	13.56%	13.56%
4	31	26.27%	
5	58	49.15%	75.42%
No reply	4	1.98%	0.0
Missing	80	39.6	0.0
Mean	4.12		
Standard Deviation	1.07		
Total (answers)	118	100.0	100.0

Table 23: Promoting justice: To support equity and justice for current and futuregenerations and learn from previous generations for sustainability

Graph 23: Promoting justice: To support equity and justice for current and future generations and learn from previous generations for sustainability





Promoting and embracing nature: To acknowledge that humans are part of nature and to respect the needs and rights of other species and of nature itself in order to restore and regenerate healthy and resilient ecosystems

Most participants answered that the 'Promoting and embracing nature: To acknowledge that humans are part of nature and to respect the needs and rights of other species and of nature itself in order to restore and regenerate healthy and resilient ecosystems' is very relevant (5/5) (46.15%), while 23.08% answered that it is largely relevant 4/5.

restore and regenerate neutry and resinent ecosystems				
	Frequency	Percent (%)	Total	
1	2	1.71%	14.53%	
2	15	12.82%		
3	19	16.24%	16.24%	
4	27	23.08%		
5	54	46.15%	69.23%	
No reply	5	2.48%	0.0	
Missing	80	39.6	0.0	
Mean	3.99			
Standard Deviation	1.14			
Total (answers)	117	100.0	100.0	

Table 24: Promoting and embracing nature: To acknowledge that humans are part of nature and to respect the needs and rights of other species and of nature itself in order to restore and regenerate healthy and resilient ecosystems

Graph 24: Promoting and embracing nature: To acknowledge that humans are part of nature and to respect the needs and rights of other species and of nature itself in order to restore and regenerate healthy and resilient ecosystems







Systems thinking: To approach a sustainability problem from all sides to consider time, space and context in order to understand how elements interact within and between systems

Most participants answered that the 'Systems thinking: To approach a sustainability problem from all sides to consider time, space and context in order to understand how elements interact within and between systems' is very relevant (5/5) (57.26%), while 29.06% answered that it is largely relevant 4/5.

Table 25: Systems thinking: To approach a sustainability problem from all sides to consider
time, space and context in order to understand how elements interact within and between
systems

	Frequency	Percent (%)	Total
1	0	0.0	3.42%
2	4	3.42%	
3	12	10.26%	10.26%
4	34	29.06%	
5	67	57.26%	86.32%
No reply	5	2.48%	0.0
Missing	80	39.6	0.0
Mean	4.4		
Standard Deviation	0.81		
Total (answers)	117	100.0	100.0

Graph 25: Systems thinking: To approach a sustainability problem from all sides to consider time, space and context in order to understand how elements interact within and between systems




Critical thinking: To assess information and arguments, identify assumptions, challenge the status quo, and reflect on how personal, social and cultural backgrounds influence thinking and conclusions.

Most participants answered that the 'Critical thinking: To assess information and arguments, identify assumptions, challenge the status quo, and reflect on how personal, social and cultural backgrounds influence thinking and conclusions' is very relevant (5/5) (70.69%), while 19.83% answered that it is largely relevant 4/5.

Table 26: Critical thinking: To assess information and arguments, identify assumptions,
challenge the status quo, and reflect on how personal, social and cultural backgrounds
influence thinking and conclusions.

	Frequency	Percent (%)	Total
1	0	0.0	0.86%
2	1	0.86%	
3	10	8.62%	8.62%
4	23	19.83%	
5	82	70.69%	90.52%
No reply	6	2.97%	0.0
Missing	80	39.6	0.0
Mean	4.6		
Standard Deviation	0.68		
Total (answers)	116	100.0	100.0

Graph 26: Critical thinking: To assess information and arguments, identify assumptions, challenge the status quo, and reflect on how personal, social and cultural backgrounds influence thinking and conclusions.





DISC

DISC Developing Innopreneurship, Sustainability and Culture

Problem framing: To correctly frame current or potential challenges as a sustainability issues, and assess in terms of difficulty, people involved, time and geographical scope, in order to identify suitable approaches to anticipating and preventing problems, and to mitigating and adapting to already existing problems

Most participants answered that the 'Problem framing: To correctly frame current or potential challenges as a sustainability issues, and assess in terms of difficulty, people involved, time and geographical scope, in order to identify suitable approaches to anticipating and preventing problems, and to mitigating and adapting to already existing problems' is very relevant (5/5) (52.14%), while 29.91% answered that it is largely relevant 4/5.

Table 27: Problem framing: To correctly frame current or potential challenges as a sustainability issues, and assess in terms of difficulty, people involved, time and geographical scope, in order to identify suitable approaches to anticipating and preventing problems, and to mitigating and adapting to already existing problems

	Frequency	Percent (%)	Total
1	0	0.0	1.71%
2	2	1.71%	
3	19	16.24%	16.24%
4	35	29.91%	
5	61	52.14%	82.05%
No reply	5	2.48%	0.0
Missing	80	39.6	0.0
Mean	4.32		
Standard Deviation	0.81		
Total (answers)	117	100.0	100.0

Graph 27: Problem framing: To correctly frame current or potential challenges as a sustainability issues, and assess in terms of difficulty, people involved, time and geographical scope, in order to identify suitable approaches to anticipating and preventing problems, and to mitigating and adapting to already existing problems





Futures literacy: To envision alternative sustainable futures by imagining and developing alternative scenarios and identifying the steps needed to achieve a preferred sustainable future

Most participants answered that the 'Futures literacy: To envision alternative sustainable futures by imagining and developing alternative scenarios and identifying the steps needed to achieve a preferred sustainable future' is largely relevant 4/5 (40.0), while 34.78% answered that it is very relevant (5/5).

Table 28: Problem framing: To correctly frame current or potential challenges as a sustainability issues, and assess in terms of difficulty, people involved, time and geographical scope, in order to identify suitable approaches to anticipating and preventing problems, and to mitigating and adapting to already existing problems

	Frequency	Percent (%)	Total
1	1	0.87%	10.43%
2	11	9.57%	
3	17	14.78%	14.78%
4	46	40.0	
5	40	34.78%	74.78%
No reply	7	3.47%	0.0
Missing	80	39.6	0.0
Mean	3.98		
Standard Deviation	0.98		
Total (answers)	115	100.0	100.0

Graph 28: Problem framing: To correctly frame current or potential challenges as a sustainability issues, and assess in terms of difficulty, people involved, time and geographical scope, in order to identify suitable approaches to anticipating and preventing problems, and to mitigating and adapting to already existing problems







Adaptability: To manage transitions and challenges in complex sustainability situations and make decisions related to the future in the face of uncertainty, ambiguity and risk

Most participants answered that the 'Adaptability: To manage transitions and challenges in complex sustainability situations and make decisions related to the future in the face of uncertainty, ambiguity and risk' is very relevant (5/5) (42.24%), while 32.76% answered that it is largely relevant 4/5.

Table 29: Problem framing: To correctly frame current or potential challenges as a sustainability issues, and assess in terms of difficulty, people involved, time and geographical scope, in order to identify suitable approaches to anticipating and preventing problems, and to mitigating and adapting to already existing problems

	Frequency	Percent (%)	Total
1	2	1.72%	8.62%
2	8	6.9	
3	19	16.38%	16.38%
4	38	32.76%	
5	49	42.24%	75.0
No reply	6	2.97%	0.0
Missing	80	39.6	0.0
Mean	4.07		
Standard Deviation	1.01		
Total (answers)	116	100.0	100.0

Graph 29: Problem framing: To correctly frame current or potential challenges as a sustainability issues, and assess in terms of difficulty, people involved, time and geographical scope, in order to identify suitable approaches to anticipating and preventing problems, and to mitigating and adapting to already existing problems







Exploratory thinking: To adopt a relational way of thinking by exploring and linking different disciplines, using creativity and experimentation with novel ideas or methods

Most participants answered that the 'Exploratory thinking: To adopt a relational way of thinking by exploring and linking different disciplines, using creativity and experimentation with novel ideas or methods' is very relevant (5/5) (48.28%), while 30.17% answered that it is largely relevant 4/5.

Table 30: Exploratory thinking: To adopt a relational way of thinking by exploring and linking different disciplines, using creativity and experimentation with novel ideas or methods

	Frequency	Percent (%)	Total
1	0	0.0	6.03%
2	7	6.03%	
3	18	15.52%	15.52%
4	35	30.17%	
5	56	48.28%	78.45%
No reply	6	2.97%	0.0
Missing	80	39.6	0.0
Mean	4.21		
Standard Deviation	0.92		
Total (answers)	116	100.0	100.0

Graph 30: Exploratory thinking: To adopt a relational way of thinking by exploring and linking different disciplines, using creativity and experimentation with novel ideas or methods







Political agency: To navigate the political system, identify political responsibility and accountability for unsustainable behaviour, and demand effective policies for sustainability

Most participants answered that the 'Political agency: To navigate the political system, identify political responsibility and accountability for unsustainable behaviour, and demand effective policies for sustainability' is largely relevant 4/5 (35.34%), while 28.45% answered that it is very relevant (5/5).

	Frequency	Percent	Total
		(%)	
1	4	3.45%	9.48%
2	7	6.03%	
3	31	26.72%	26.72%
4	41	35.34%	
5	33	28.45%	63.79%
No reply	6	2.97%	0.0
Missing	80	39.6	0.0
Mean	3.79		
Standard Deviation	1.03		
Total (answers)	116	100.0	100.0

Table 31: Political agency: To navigate the political system, identify political responsibilityand accountability for unsustainable behaviour, and demand effective policies forsustainability

Graph 31: Political agency: To navigate the political system, identify political responsibility and accountability for unsustainable behaviour, and demand effective policies for sustainability







Collective action: To act for change in collaboration with others

Most participants answered that the 'Collective action: To act for change in collaboration with others' is very relevant (5/5) (51.72%), while 27.59% answered that it is largely relevant 4/5.

	Frequency	Percent (%)	Total
1	1	0.86%	6.03%
2	6	5.17%	
3	17	14.66%	14.66%
4	32	27.59%	
5	60	51.72%	79.31%
No reply	6	2.97%	0.0
Missing	80	39.6	0.0
Mean	4.24		
Standard Deviation	0.95		
Total (answers)	116	100.0	100.0

Table 32: Collective action: To act for change in collaboration with others



Graph 32: Collective action: To act for change in collaboration with others





Individual initiative: To identify own potential for sustainability, actively contribute to improving prospects for the community and the planet, and develop adaptability to change own daily habits towards a more sustainable way of living

Most participants answered that the 'Individual initiative: To identify own potential for sustainability, actively contribute to improving prospects for the community and the planet, and develop adaptability to change own daily habits towards a more sustainable way of living' is very relevant (5/5) (38.79%), while 34.48% answered that it is largely relevant 4/5.

	Frequency	Percent (%)	Total
1	1	0.86%	7.76%
2	8	6.9	
3	22	18.97%	18.97%
4	40	34.48%	
5	45	38.79%	73.28%
No reply	6	2.97%	0.0
Missing	80	39.6	0.0
Mean	4.03		
Standard Deviation	0.97		
Total (answers)	116	100.0	100.0

Table 33: Individual initiative: To identify own potential for sustainability, actively contribute to improving prospects for the community and the planet, and develop adaptability to change own daily habits towards a more sustainable way of living

Graph 33: Individual initiative: To identify own potential for sustainability, actively contribute to improving prospects for the community and the planet, and develop adaptability to change own daily habits towards a more sustainable way of living







2.4 Teaching and learning approaches

Collaborative learning – including contributions from guest speakers, work-based learning, interdisciplinary/ multidisciplinary working, and collaborative learning and co-inquiry

Most participants answered that the 'Collaborative learning – including contributions from guest speakers, work-based learning, interdisciplinary/ multidisciplinary working, and collaborative learning and co-inquiry' is very relevant (5/5) (57.26%), while 26.5 answered that it is largely relevant 4/5.

	Frequency	Percent (%)	Total
1	1	0.85%	4.27%
2	4	3.42%	
3	14	11.97%	11.97%
4	31	26.5	
5	67	57.26%	83.76%
No reply	5	2.48%	0.0
Missing	80	39.6	0.0
Mean	4.36		
Standard Deviation	0.89		
Total (answers)	117	100.0	100.0

Table 34: Collaborative learning – including contributions from guest speakers, workbased learning, interdisciplinary/ multidisciplinary working, and collaborative learning and co-inquiry

Graph 34: Collaborative learning – including contributions from guest speakers, workbased learning, interdisciplinary/ multidisciplinary working, and collaborative learning and co-inquiry







Thinking Creatively for Future Scenarios by using role-play, real-world inquiry, futures visioning, problem-based learning, and providing space for emergence

Most participants answered that the 'Thinking Creatively for Future Scenarios by using roleplay, real-world inquiry, futures visioning, problem-based learning, and providing space for emergence' is very relevant (5/5) (41.88%), while 31.62% answered that it is largely relevant 4/5.

Table 35: Thinking Creatively for Future Scenarios by using role-play, real-world inquiry,
futures visioning, problem-based learning, and providing space for emergence

	Frequency	Percent (%)	Total
1	3	2.56%	6.84%
2	5	4.27%	
3	23	19.66%	19.66%
4	37	31.62%	
5	49	41.88%	73.5
No reply	5	2.48%	0.0
Missing	80	39.6	0.0
Mean	4.06		
Standard Deviation	1.01		
Total (answers)	117	100.0	100.0

Graph 35: Thinking Creatively for Future Scenarios by using role-play, real-world inquiry, futures visioning, problem-based learning, and providing space for emergence







Participatory Learning with emphasis on group or peer learning, developing dialogue, experiential learning, action research/learning to act, and developing case studies with local community groups and business

Most participants answered that the 'Participatory Learning with emphasis on group or peer learning, developing dialogue, experiential learning, action research/learning to act, and developing case studies with local community groups and business' is very relevant (5/5) (54.7), while 29.06% answered that it is largely relevant 4/5.

	Frequency	Percent (%)	Total
1	1	0.85%	4.27%
2	4	3.42%	
3	14	11.97%	11.97%
4	34	29.06%	
5	64	54.7	83.76%
No reply	5	2.48%	0.0
Missing	80	39.6	0.0
Mean	4.33		
Standard Deviation	0.88		
Total (answers)	117	100.0	100.0

Table 36: Participatory Learning with emphasis on group or peer learning, developingdialogue, experiential learning, action research/learning to act, and developing casestudies with local community groups and business

Graph 36: Participatory Learning with emphasis on group or peer learning, developing dialogue, experiential learning, action research/learning to act, and developing case studies with local community groups and business







Systemic Thinking and Analysis the use of real-world case studies and critical incidents, project-based learning, stimulus activities, and the use of the campus as a learning resource

Most participants answered that the 'Systemic Thinking and Analysis the use of real-world case studies and critical incidents, project-based learning, stimulus activities, and the use of the campus as a learning resource' is very relevant (5/5) (56.41%), while 30.77% answered that it is largely relevant 4/5.

Table 37: Systemic Thinking and Analysis the use of real-world case studies and critical
incidents, project-based learning, stimulus activities, and the use of the campus as a
learning resource

	Frequency	Percent (%)	Total
1	0	0.0	1.71%
2	2	1.71%	
3	13	11.11%	11.11%
4	36	30.77%	
5	66	56.41%	87.18%
No reply	5	2.48%	0.0
Missing	80	39.6	0.0
Mean	4.42		
Standard Deviation	0.76		
Total (answers)	117	100.0	100.0

Graph 37: Systemic Thinking and Analysis the use of real-world case studies and critical incidents, project-based learning, stimulus activities, and the use of the campus as a learning resource







Critical Reflection including the more traditional lecture, but also newer approaches such as reflexive accounts, learning journals, and discussion groups

Most participants answered that the 'Critical Reflection including the more traditional lecture, but also newer approaches such as reflexive accounts, learning journals, and discussion groups' is very relevant (5/5) (55.56%), while 28.21% answered that it is largely relevant 4/5.

	Frequency	Percent (%)	Total
1	0	0.0	1.71%
2	2	1.71%	
3	17	14.53%	14.53%
4	33	28.21%	
5	65	55.56%	83.76%
No reply	5	2.48%	0.0
Missing	80	39.6	0.0
Mean	4.38		
Standard Deviation	0.8		
Total (answers)	117	100.0	100.0

Table 38: Critical Reflection including the more traditional lecture, but also newerapproaches such as reflexive accounts, learning journals, and discussion groups

Graph 38: Critical Reflection including the more traditional lecture, but also newer approaches such as reflexive accounts, learning journals, and discussion groups







Simulation and Dramatisation Exercises in general provide excellent strategies for promoting the understanding of the options which have to be considered in making a decision on any issue, environmental or other

Most participants answered that the 'Simulation and Dramatisation Exercises in general provide excellent strategies for promoting the understanding of the options which have to be considered in making a decision on any issue, environmental or other' is very relevant (5/5) (36.75%), while 29.91% answered that it is largely relevant 4/5.

decision on any issue, environmental or other	
for promoting the understanding of the options which have to be considered in making	а
Table 39: Simulation and Dramatisation Exercises in general provide excellent strategie	25

	Frequency	Percent (%)	Total
1	1	0.85%	5.98%
2	6	5.13%	
3	32	27.35%	27.35%
4	35	29.91%	
5	43	36.75%	66.67%
No reply	5	2.48%	0.0
Missing	80	39.6	0.0
Mean	3.97		
Standard Deviation	0.96		
Total (answers)	117	100.0	100.0

Graph 39: Simulation and Dramatisation Exercises in general provide excellent strategies for promoting the understanding of the options which have to be considered in making a decision on any issue, environmental or other







Problem Based Learning (PBL) - a student-centred educational method in which students learn about a subject by working in groups to solve an open-ended problem.

Most participants answered that the 'Problem Based Learning (PBL) - a student-centred educational method in which students learn about a subject by working in groups to solve an open-ended problem. Problem solving has its roots in the 1970's when environmental awareness was closely linked to building public awareness on intense environmental problems that eventually led to ecological crises including pollution, depletion of natural resources, desertification etc' is very relevant (5/5) (48.72%), while 33.33% answered that it is largely relevant 4/5.

	Frequency	Percent (%)	Total
1	2	1.71%	4.27%
2	3	2.56%	
3	16	13.68%	13.68%
4	39	33.33%	
5	57	48.72%	82.05%
No reply	5	2.48%	0.0
Missing	80	39.6	0.0
Mean	4.25		
Standard Deviation	0.91		
Total (answers)	117	100.0	100.0

Table 40: Problem Based Learning (PBL) - a student-centred educational method in which students learn about a subject by working in groups to solve an open-ended problem.

Graph 40: Problem Based Learning (PBL) - a student-centred educational method in which students learn about a subject by working in groups to solve an open-ended problem.







Analogies and Models an effective analogy helps learners activate, transfer and apply existing knowledge into a new context. In this sense, it is not only a useful but often necessary part of an educational intervention

Most participants answered that the 'Analogies and Models an effective analogy helps learners activate, transfer and apply existing knowledge into a new context. In this sense, it is not only a useful but often necessary part of an educational intervention' is very relevant (5/5) (38.46%), while 36.75% answered that it is largely relevant 4/5.

Table 41: Analogies and Models an effective analogy helps learners activate, transfer and
apply existing knowledge into a new context. In this sense, it is not only a useful but often
necessary part of an educational intervention

	Frequency	Percent (%)	Total
1	2	1.71%	7.69%
2	7	5.98%	
3	20	17.09%	17.09%
4	43	36.75%	
5	45	38.46%	75.21%
No reply	5	2.48%	0.0
Missing	80	39.6	0.0
Mean	4.04		
Standard Deviation	0.98		
Total (answers)	117	100.0	100.0

Graph 41: Analogies and Models an effective analogy helps learners activate, transfer and apply existing knowledge into a new context. In this sense, it is not only a useful but often necessary part of an educational intervention





Experiments - an experiment is an activity that is conducted under controlled conditions to test a hypothesis, to confirm a law, to discover an unknown result or to induce a change to one or more system variables caused by internal or external factors

Most participants answered that the 'Experiments - an experiment is an activity that is conducted under controlled conditions to test a hypothesis, to confirm a law, to discover an unknown result or to induce a change to one or more system variables caused by internal or external factors' is very relevant (5/5) (35.04%), while 31.62% answered that it is largely relevant 4/5.

5 ,		,	,
	Frequency	Percent (%)	Total
1	5	4.27%	15.38%
2	13	11.11%	
3	21	17.95%	17.95%
4	37	31.62%	
5	41	35.04%	66.67%
No reply	5	2.48%	0.0
Missing	80	39.6	0.0
Mean	3.82		
Standard Deviation	1.16		
Total (answers)	117	100.0	100.0

Table 42: Experiments - an experiment is an activity that is conducted under controlled conditions to test a hypothesis, to confirm a law, to discover an unknown result or to induce a change to one or more system variables caused by internal or external factors

Graph 42: Experiments - an experiment is an activity that is conducted under controlled conditions to test a hypothesis, to confirm a law, to discover an unknown result or to induce a change to one or more system variables caused by internal or external factors







Learning Through Objects - this approach allows the learner, through his senses, to make a direct connection to the object which ultimately leads to increased interest

Most participants answered that the 'Learning Through Objects this approach allows the learner, through his senses, to make a direct connection to the object which ultimately leads to increased interest' is very relevant (5/5) (36.21%), while 31.03% answered that it is largely relevant 4/5.

	Frequency	Percent (%)	Total
1	9	7.76%	16.38%
2	10	8.62%	
3	19	16.38%	16.38%
4	36	31.03%	
5	42	36.21%	67.24%
No reply	6	2.97%	0.0
Missing	80	39.6	0.0
Mean	3.79		
Standard Deviation	1.24		
Total (answers)	116	100.0	100.0

Table 43: Learning Through Objects - this approach allows the learner, through his senses, to make a direct connection to the object which ultimately leads to increased interest

Graph 43: Learning Through Objects - this approach allows the learner, through his senses, to make a direct connection to the object which ultimately leads to increased interest







Geographical Maps, Graphics and other Visual Tools – although map skills (interpretation and drawing) mainly link to geography, they also concern the overall curriculum and can be further developed in history, social studies, literature, mathematics and naturally in ESD by educators looking for new ways to enhance teaching and learning methods

Most participants answered that the 'Geographical Maps, Graphics and other Visual Tools – although map skills (interpretation and drawing) mainly link to geography, they also concern the overall curriculum and can be further developed in history, social studies, literature, mathematics and naturally in ESD by educators looking for new ways to enhance teaching and learning methods' is very relevant (5/5) (38.46%), while 22.22% answered that it is quite related (3/5). 21.37% answered that it is largely relevant 4/5.

	Frequency	Percent (%)	Total
1	10	8.55%	17.95%
2	11	9.4	
3	26	22.22%	22.22%
4	25	21.37%	
5	45	38.46%	59.83%
No reply	5	2.48%	0.0
Missing	80	39.6	0.0
Mean	3.72		
Standard Deviation	1.3		
Total (answers)	117	100.0	100.0

Table 44: Geographical Maps, Graphics and other Visual Tools



Graph 44: Geographical Maps, Graphics and other Visual





Concept Maps are used to investigate and highlight the relationships between concepts. They are based on the theory of constructivism according to which it is the learner himself who creates knowledge

Most participants answered that the 'Concept Maps are used to investigate and highlight the relationships between concepts. They are based on the theory of constructivism according to which it is the learner himself who creates knowledge' is largely relevant 4/5 (37.93%), while 34.48% answered that it is very relevant (5/5).

	Frequency	Percent (%)	Total
1	4	3.45%	8.62%
2	6	5.17%	
3	22	18.97%	18.97%
4	44	37.93%	
5	40	34.48%	72.41%
No reply	6	2.97%	0.0
Missing	80	39.6	0.0
Mean	3.95		
Standard Deviation	1.03		
Total (answers)	116	100.0	100.0

Table 45: Concept Maps

Graph 45: Concept Maps







Brainstorming and Making Charts a technique used to explore spontaneous ideas generated by a group on any given subject in a short time

Most participants answered that the 'Brainstorming and Making Charts a technique used to explore spontaneous ideas generated by a group on any given subject in a short time' is largely relevant 4/5 (40.17%), while 37.61% answered that it is very relevant (5/5).

	Frequency	Percent (%)	Total
1	1	0.85%	2.56%
2	2	1.71%	
3	23	19.66%	19.66%
4	47	40.17%	
5	44	37.61%	77.78%
No reply	5	2.48%	0.0
Missing	80	39.6	0.0
Mean	4.12		
Standard Deviation	0.84		
Total (answers)	117	100.0	100.0

Table 46: Brainstorming and Making Charts

Graph 46: Brainstorming and Making Charts a technique used to explore spontaneous ideas generated by a group on any given subject in a short time







Working in Groups encourages learners to communicate, participate and learn to share and cooperate

Most participants answered that the 'Working in Groups encourages learners to communicate, participate and learn to share and cooperate' is very relevant (5/5) (59.83%), while 24.79% answered that it is largely relevant 4/5.

	Frequency	Percent (%)	Total
1	1	0.85%	2.56%
2	2	1.71%	
3	15	12.82%	12.82%
4	29	24.79%	
5	70	59.83%	84.62%
No reply	5	2.48%	0.0
Missing	80	39.6	0.0
Mean	4.41		
Standard Deviation	0.84		100.0
Total (answers)	117		
		100.0	

Table 47: Working in Groups

Graph 47: Working in Groups encourages learners to communicate, participate and learn to share and cooperate







Field Visits and Research the term "field" refers to the natural, cultural and social environment including a wide range of sites (such as wetlands, coasts, streams, forests, neighbourhoods, settlements, rural, archaeological and industrial sites, etc.)

Most participants answered that the 'Field Visits and Research the term "field" refers to the natural, cultural and social environment including a wide range of sites (such as wetlands, coasts, streams, forests, neighbourhoods, settlements, rural, archaeological and industrial sites, etc.)' is very relevant (5/5) (51.72%), while 21.55% answered that it is largely relevant 4/5.

	Frequency	Percent (%)	Total
1	7	6.03%	8.62%
2	3	2.59%	
3	21	18.1	18.1
4	25	21.55%	
5	60	51.72%	73.28%
No reply	6	2.97%	0.0
Missing	80	39.6	0.0
Mean	4.1		
Standard Deviation	1.16		100.0
Total (answers)	116		
		100.0	

Table 48: Field Visits and Research

Graph 48: Field Visits and Research







2.5 Discussion

The prominence of environmental activism has shifted from being a marginalized movement to becoming a central area of interest for students, teachers, and the wider public. In the context of environmental conservation, technology can play a dual role, serving as both a facilitator and a hindrance. By making appropriate decisions, leaders of universities and colleges have the potential to steer their institutions towards a more sustainable trajectory in the realm of higher education. In recent years, there has been a notable emphasis on sustainable development within the realm of higher education, with some institutions adopting it as a guiding principle. The primary objective is to provide students with an education that encompasses the principles of sustainable development. In addition, scholars are expected to engage in rigorous research and dissemination of knowledge in this field, while the professional staff is responsible for ensuring the long-term sustainability of the institution. To what degree can higher education institutions (HEIs) effectively facilitate sustainable development and integrate their many endeavors to support this goal?

In recent years, the concept of sustainable development has transitioned from being solely discussed in geography textbooks and United Nations statements to becoming a prominent topic within higher education discourse and strategic planning. The Sustainable Development Goals (SDGs) have emerged as a widely adopted framework within Higher Education Institutions (HEIs) for the purpose of organizing and categorizing their initiatives, as well as actively integrating their efforts in accordance with these goals. The International Journal of Sustainability in Higher Education is a devoted academic journal that focuses on the aforementioned topic. The concept of sustainability has gained widespread acceptance as a unifying principle for many stakeholders and activities inside an organization, serving as a public rationale for its continued existence. However, the concept of sustainability does present several significant challenges. Firstly, it is important to acknowledge that the notions of sustainable development and sustainability include inherent flaws due to their lack of specificity, rendering them vulnerable to being co-opted by agendas that undermine social justice and ecological well-being. Alternatively, these concepts may result in a weak consensus that fails to prompt meaningful action. However, it is more advantageous to actively involve oneself with the concept rather than abstaining from any involvement. Firstly, it is a concept that has widespread acceptance, both in society at large and within the realm of higher education. Consequently, scholars are compelled to engage with this notion, critically examine its merits, and strive to promote improved iterations. Moreover, although its inherent ambiguities, the aforementioned term possesses the capacity to raise awareness among mankind regarding the imperative of adopting a fundamentally distinct approach to societal organization. Consequently, it can serve as a catalyst for crucial discussions and initiatives.

According to the findings of the survey outlined in this report, the prevailing perception of an educational institution is that it functions as a means of generating external advantages. This analogy likens it to a manufacturing facility that produces novel things, a skilled blacksmith who transforms iron, or a medical procedure that corrects maladies. Primarily, educators fulfill their role by imparting knowledge and skills to individuals. In the context of higher education institutions, they also engage in research activities. This dual duty enables them to generate knowledge, skills, and values, which subsequently contribute to the



Co-funded by the European Union



development of products, services, and technologies that are essential for both individuals and society. However, it is possible to perceive educational institutions from an alternative perspective, acknowledging their inherent existence and intrinsic significance in the present moment. Educational institutions, such as schools and higher education institutions (HEIs), hold significance as communities, regardless of their temporary nature, and irrespective of the future outcomes and external advantages they generate. The second concept might be referred to as the expressive function of education, in contrast to the projective function. These two types encompass a significant portion of the activities carried out by educational institutions. Both of these approaches operate under the assumption that the ideas or purposes are predetermined or originate from an external source. Another purpose of educational institutions, particularly higher education institutions (HEIs), is to produce novel ideas on projections or expressions. In the context of this discourse, the term "constructive" can be borrowed from the works of Amartya Sen. Sen, a renowned scholar, has delineated various dimensions of democracy, including its intrinsic value, instrumental value, and constructive value. The intrinsic value pertains to democracy's role in fostering a meaningful and dignified existence. The instrumental value refers to democracy's capacity to facilitate decisions that promote the interests of all members of society. Lastly, the constructive value of democracy lies in its ability to provide citizens with a platform for mutual learning and the formation of societal values and priorities. These three concepts manifest themselves in several manners with regards to sustainable development.

In the first mode, higher education institutions (HEIs) play a crucial role in facilitating the realization of sustainable development. The primary method employed by educators is to impart knowledge and skills to their pupils with the aim of fostering sustainability. The incorporation of this provision is occasionally assimilated into preexisting courses, and perceived as an alteration of vocational education. In certain instances, sustainable development is integrated into the overall civic and personal education of pupils, and may take place beyond the confines of the officially recognized curriculum. A substantial corpus of scholarly works exists pertaining to education for sustainable development, with a particular focus on climate change education. This body of literature encompasses personal narratives of instructional experiences, pedagogical strategies, skill sets, and curriculum frameworks. Higher education institutions (HEIs) primarily showcase their reputation through the achievements of its graduates. However, it is important to acknowledge that HEIs also contribute to society through research endeavors and active involvement in the community. The societal contributions of these domains have garnered considerable attention in the United Kingdom and other regions in recent years, primarily due to the emphasis on the "impact" agenda. This goal has manifested itself in research funding and evaluation rules. Higher education institutions (HEIs) have increasingly adopted the practice of aligning their diverse research and community involvement endeavors with the principles of sustainable development, with a particular focus on the Sustainable Development Goals (SDGs). In certain instances, there exists an educational function that extends beyond the realm of higher education students to encompass a wider demographic. This phenomenon is exemplified by the utilization of Massive Open Online Courses (MOOCs) pertaining to a particular subject, as well as the provision of training programs targeting professionals or the general populace. In the context of the DISC project, the diverse manifestations of effect have been classified into four distinct stages. The influence of higher education activity, encompassing education, knowledge production, services, public debate, and campus





operations, is primarily transmitted through individuals who directly engage with the institution (referred to as 'bridging actors'). These actors include students, as well as communities and organizations participating in projects, courses, and other activities.

The latter phase pertains to the society realm, encompassing either indirect effects through intermediary actors, or direct effects on the economic, political, and cultural domains. Ultimately, the ecosphere itself is subject to influence, whether it is by direct means or indirectly through preceding stages. The system was designed with a specific focus on climate change, but its applicability extends equally to the realm of sustainable development. To comprehend the intricate dynamics at play, it is imperative to acknowledge the presence of diverse groups and institutions within society that operate alongside the higher education system. This subject warrants independent examination. There exists a multitude of diverse channels of impact and potential results. The distribution of research evidence across these several pathways exhibits significant disparities. Certain measurements are relatively straightforward, such as assessing the knowledge gained on climate change by participants in a Massive Open Online Course (MOOC). However, other measurements pose significant challenges, such as evaluating the influence of academics' Twitter engagement on public views about the loss of biodiversity.

Can higher education effectively contribute to the achievement of sustainable development goals through its proactive approach? The potential impacts of higher education on the attainment of a sustainable society are wide-ranging and significant. These include the provision of professional training, fostering personal and civic growth, as well as facilitating advancements in knowledge and technological innovation. There are individuals who assert that the attainment of sustainable development would be unattainable in the absence of these factors. Nevertheless, the effects of higher education are just as unpredictable as the institutions in which they occur. Initially, it is important to acknowledge the existence of a multitude of potential paths that emanate from the five modalities and extend through diverse players in following phases. It is worth noting that certain pathways are considerably challenging to quantify, and the interaction between distinct trajectories of influence remains uncertain.

Furthermore, it should be noted that not all agents and structures within higher education institutions (HEIs) are in accordance with the sustainable development agenda, even in its more mainstream and accepted versions. This lack of alignment may result in a reduction of their overall contribution to sustainable development efforts, as well as the possibility for contradictory actions and undermining of the agenda. These tensions are especially pronounced within the framework of marketization and financial constraints on higher education institutions (HEIs). While green credentials can be advantageous for HEIs in attracting students, they are likely to be deprioritized or disregarded if they do not contribute to financial gains.

The recognition that Higher Education Institutions (HEIs) has their own distinct identities as communities and influential entities within society is often overlooked. Consideration is occasionally given to the role of higher education institutions (HEIs) as economic agents, as they contribute to the generation of employment opportunities and allocation of resources within their respective localities. In the context of sustainable development, this direct influence can be of great importance, as HEIs exert a noticeable impact on their surroundings, not only at the local level but also on a national and global scale. The primary



Co-funded by the European Union



focus in this domain has been directed towards the carbon emissions resulting from the mobility of international students. Additionally, there has been some consideration given to the mobility of staff for conferences and fieldwork. This has prompted institutions to engage in introspection as they navigate the conflicting demands of financial and reputational imperatives associated with internationalization, while grappling with feelings of guilt. Higher education institutions (HEIs) are dynamic human settlements that have a discernible environmental impact, even though a portion of their activities have transitioned to online platforms in the post-COVID age. Higher education institutions (HEIs) have undertaken deliberate and focused endeavors in recent years to improve their practices. In addition, there has been a notable rise in the availability of benchmarks, ratings, and rankings pertaining to the sustainability of university campuses. One such example is the People and Planet University League, which evaluates various aspects including carbon reduction, sustainable food and waste management, workers' rights, and ethical investments. At the global level, the University of Indonesia's GreenMetric is a prominent assessment tool, with Wageningen University securing the top position in 2022. However, as recognized by the People and Planet University League, sustainable development encompasses not only the preservation of the natural environment but also the consideration of its impact on human well-being. The expressive mode encompasses the intricate dynamics of human interaction within a given community, as well as the various types of organization and the equitable distribution of opportunities and resources. Although sometimes overlooked in discussions on sustainable development, it is important to acknowledge the efforts made by institutions in promoting equality, diversity, and inclusion (EDI). These efforts encompass initiatives aimed at combating workplace discrimination, harassment, and bullying, as well as fostering an environment that is courteous and supportive.

The presence of inconsistencies between the projective and expressive roles can pose significant challenges. For example, students may perceive a discrepancy between the energy wastage in their classrooms and the institution's promotion of environmentally friendly messaging, leading to a perception of hypocrisy. Similarly, staff members may observe a mismatch between their higher education institutions' statements on gender equality and the inadequate treatment of female employees in practice. Achieving unity and coherence appears to be a more attainable objective inside the expressive style compared to the projective form. In the context of an institution's physical infrastructure and direct emissions, there exists the potential for a comprehensive transformation of the entire institution, a feat that has been accomplished by a select few institutions. In relation to the features of human community, the difficulty is heightened due to the inherent problem of attaining alignment in institutional culture. This obstacle persists even in the presence of concerted and charismatic leadership, as well as the effective reform of governance structures. The difficulty is further compounded by the inherent ambiguity and ongoing debate surrounding the concept of sustainable development, as elucidated in the subsequent section.

Ultimately, higher education plays a helpful role in the context of sustainable development. This pertains to the endeavor of critically examining and redefining the concept of sustainable development, rather than merely implementing or embodying it in daily existence. This procedure encompasses ontological dimensions pertaining to being and existence, epistemological dimensions concerning the nature of knowledge, and axiological



DISC



Developing Innopreneurship, Sustainability and Culture

dimensions concerning values and purposes. The epistemological inquiries have been notably intense in the context of climate change, as the scientific community has engaged in a highly visible dispute regarding the legitimacy of its findings. Higher education institutions (HEIs) play a helpful role in several ways. Academic literature, such as scholarly journal articles authored by experts in the field, can serve as formal and clear platforms for addressing the aforementioned problem and presenting alternative conceptual frameworks. However, it is important to acknowledge that these concepts undergo continuous shaping through various subtle means, such as classroom exchanges, café talks, research project team deliberations, and professional staff meeting strategizing. The process of ideation occurs not just inside the realm of higher education, but also extends outside it through various mainstream and social media platforms, facilitating direct and indirect engagement with the wider public. The examination and debate of sustainable development are particularly well-suited to this type of analysis and disagreement. The concept under consideration can be characterized as a "shell" concept, as it possesses essential elements that pertain to an ongoing process of transformation without self-termination. However, beyond these fundamental attributes, it remains open to the incorporation of diverse moral and political perspectives as desired by the one employing it. Conceptions of sustainable development encompass a wide spectrum of perspectives, ranging from those grounded in principles of social and environmental justice, decolonization, and indigeneity, to those that align with the preservation of free-market capitalism on a global scale. These various viewpoints revolve around the prevailing centrist notion of a moderated market economy, which is deemed sustainable through a combination of governmental regulations and the acknowledgment of individual and corporate accountability. The Sustainable Development Goals (SDGs) represent the embodiment of the prevailing liberal consensus regarding the trajectory of human society. While encompassing many elements aimed at upholding fundamental rights for all individuals and addressing the adverse effects on the environment, these measures do not entertain the notion of fundamentally reevaluating the global economic system and its strong attachment to economic growth.

The endeavor to harmonize the interests of humans and non-humans without undergoing any fundamental alteration in our economic and political frameworks has resulted in the estrangement of environmentalists and socialists. These groups perceive sustainable development as a mere facade that perpetuates exploitative practices inherent in global capitalism. The term 'sustainability' is frequently employed interchangeably with 'sustainable development', particularly when the emphasis is not on the societal dimension. Nevertheless, the clarity of the situation becomes obscured due to a rather divergent interpretation of the phrase, wherein it denotes not just the continuation within the limits of the ecosystem's carrying capacity, but rather the continuation without considering any external consequences. A firm may use the term "sustainability" to describe the profitability of its mining operations, rather than focusing on the environmental implications. Similarly, an NGO may refer to the "sustainability" of its initiatives to denote the integration of the work within the community even after funding has been discontinued.

The conceptualizations of sustainable development exhibit inherent variation due to the multitude of issues and the channels available for examination and deliberation. Instead of a substantial iteration of the concept, the contribution of higher education, in its optimal form, lies in its facilitation of a process. This process aims to foster an inclusive and open discourse surrounding the various prospects of sustainable development. It entails



continuous analysis, the provision of logical justifications, as well as the cultivation of creativity and imagination. In this context, higher education institutions (HEIs) have the potential to effectively contribute to the realization of sustainable development in a positive manner. However, it is crucial to perceive sustainable development as an ongoing subject of discussion and exploration, rather than a fixed concept. In addition to actively engaging in the pursuit of the Sustainable Development Goals (SDGs), it is imperative to adopt a broader perspective that extends beyond the confines of these goals. The constructive function of higher education plays a vital role in recognizing and addressing the deficiencies of the global agreement, as well as establishing the necessary circumstances for a more rigorous conceptualization. For higher education institutions (HEIs), this entails not just initiating the type of lively discussion described earlier, but also focusing their critical analysis inward, examining the institutional structures that have become synonymous with HEIs, and exploring alternative models. The process of decolonizing institutions and cultivating an ecosystem of diverse knowledge inside our existing structures is a crucial aspect that warrants attention. However, it is crucial to acknowledge that within higher education systems, there is a pressing need for additional opportunities to explore and experiment with novel forms of institutions that may not conform to our preconceived notions of higher education. These institutions may possess unique attributes that are not readily identifiable, given our deeply entrenched assumptions about the nature of higher education.

The involvement of higher education institutions (HEIs) with the sustainable development agenda can manifest in several ways, encompassing effects on the wider society, integration of these principles within the institution's operations, and the creation of novel conceptualizations. Higher education has the capacity to contribute to sustainable development by generating, embodying, and redefining it. Is it logical, feasible, and advantageous to assign the responsibility of attaining sustainable development to higher education institutions?

If we consider sustainable development as a comprehensive framework for organizing society and guiding individual lifestyles, both presently and in the future, the response must unequivocally be negative. The efficacy of higher education as a means to convey a cohesive message is subject to significant skepticism, mostly stemming from the inherent complexity and dispersion of higher educational institutions, the absence of a definitive hierarchical structure, the value placed on academic freedom, and the inevitable presence of diverse opinions. If achieving unity or homogenization is challenging inside a single institution, it becomes even more difficult within a higher education system that consists of numerous varied institutions. In the event that achieving such a state of unity were feasible, there exists skepticism regarding its desirability, as it would impede the necessary presence of lively discourse that explores alternative perspectives, particularly within the framework of epistemic pluralism. In the context of climate change and sustainability, it is commonly acknowledged that effectively tackling these complex challenges necessitates the incorporation of many perspectives, the implementation of experimental approaches, and the exploration of alternative ideas. However, sustainable development is not a singular concept or a cohesive framework of principles. However, it signifies a landscape where a multitude of divergent viewpoints can be maintained. The inherent lack of specificity in this phenomenon, which may cause frustration among individuals seeking lucidity and direction, can actually serve as a source of strength. By expressing minimal substance, this statement





serves as an opportunity to engage in profound analysis and contemplation over the desired characteristics of a sustainable society and planet over the long term.

Education, despite facing widespread criticism for its perceived shortcomings, is sometimes attributed with nearly mystical abilities to achieve various societal objectives. The phenomenon under consideration has the potential to induce significant transformations in several aspects, encompassing both personal and societal domains. However, the precise nature and extent of these changes are inherently challenging to anticipate and regulate. It is possible that the persistent expression of concern regarding the absence of coherence, fragmentation, and silo working inside higher education institutions (HEIs), as well as the call for holistic and integrated approaches, may be misguided. The transformative potential lies in various actions that occur within an undergraduate classroom, such as debates, a department's tree-planting initiative, a student-led campaign for fossil fuel divestment, a social media campaign that critiques government energy policy, a collaborative community regeneration project, or even a moment of realization experienced by a single professional enrolled in a short course. Although these actions may not be centrally planned or orchestrated, their collective impact can bring about significant change. Therefore, the responsibility of higher education institutions (HEIs) is to actively promote and support these grassroots efforts, fostering their growth and development, or at the at least, refraining from impeding or obstructing their progress. Higher education institutions (HEIs) are not entirely characterized by randomness and fragmentation, and it is incorrect to assume that leadership has no potential to effect change. Despite their diversity, there are certain commonalities that bind HEIs together, and it is possible to produce positive momentum through effective leadership. Engagements involving societal agendas, such as sustainable development, should be approached with a recognition of the complex and unpredictable nature of organizational dynamics. It is important to acknowledge the significance of grassroots initiatives and the various ways in which higher education institutions contribute to society, including through projective, expressive, and constructive means. Significantly, this matter encompasses not only the assessment of influence, but also the examination and reformation of the fundamental concepts that support it. This process entails a significant reassertion of agency for the institution. By maintaining a steadfast dedication to continuous investigation and profound contemplation, while engaging in active discourse, and within the framework of diverse knowledge systems and a multitude of perspectives, the realm of higher education has the potential to undertake a rigorous examination of the concept of sustainable development. Through this process, higher education can foster a reimagining of sustainable development, thereby initiating a constructive societal influence that may offer us an opportunity to navigate the present ecological crisis.

Finally, the incorporation of sustainability into the educational curriculum does not entail the mere introduction of environmental subject matter into pedagogy. Rather, it involves equipping individuals with the necessary skills to critically evaluate the interconnectedness of environmental, social, and economic elements, thereby guiding their decision-making processes towards more sustainable and socially conscientious outcomes. This pertains to the education and development of individuals who are actively engaged and proactive, possessing the ability to make responsible decisions. These individuals also gain an understanding of the challenges presented by globalization, while promoting respect for diversity and fostering a culture of peace. Additionally, this aims to strengthen the strategies



DISC

DISC Developing Innopreneurship, Sustainability and Culture

for empowering an engaged citizenry that is capable of effecting change through direct action. Various initiatives have been implemented within universities to promote the integration of sustainability through educational practices. These initiatives primarily include the incorporation of sustainability topics into curricula, the utilization of active pedagogies that incorporate sustainability content, and the establishment of assessment systems that facilitate learning in sustainability. These programs present a certain level of intricacy as they necessitate a shift in teachers' worldview, along with targeted training.

Moreover, challenges emerge in relation to teachers' comprehension of the notion of "incorporating sustainability into the curriculum" and its integration across various subjects, regardless of the disciplinary domain. This undertaking necessitates a novel and interdisciplinary approach to practical implementation. While educators possess a theoretical comprehension of this integration, they face challenges when attempting to implement it in practical settings. The incorporation of sustainability within the university setting is contingent upon several crucial variables, which encompass the integration of sustainability into the curriculum, the provision of adequate training for educators, and the incorporation of comprehensive understandings of sustainability into their pedagogical practices. The examination of this particular aspect has been undertaken by Shephard and Furnari (2013), along with other researchers, who have determined that it is crucial to ascertain the specific ideas that influence teachers during the execution of their instructional responsibilities. These concepts are of utmost importance in the educational and training endeavors that seek to instill students with sustainable habits.





3. CONTENT ANALYSIS OF STUDENT INTERVIEWS AND FOCUS GROUPS ON EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD)

3.1 Conceptual Familiarity and Interpretations of ESD

Across contexts, students exhibited varying degrees of familiarity with ESD. Portuguese and Greek students reported high levels of conceptual and practical engagement, often linked to institutional structures like RUN-EU and Eco-Schools Councils. For example, the Portuguese master's students actively integrated sustainability goals into projects and theses, reflecting an environment where ESD is both institutionalized and personally meaningful.

In contrast, Italian students voiced skepticism, with one noting: "Sustainability isn't given enough weight, so it remains abstract and in the hands of those who influence real reforms". Another commented that ESD "feels too abstract," associating it with isolated symbolic events like "Fridays for Future" rather than systemic curriculum integration.

This ambivalence reflects a broader epistemological tension: while some students equate ESD with actionable and relevant content, others perceive it as theoretical, vague, or politically diluted. The word "development" itself is problematized as a neo-colonial construct by some students, indicating critical post-growth and decolonial awareness—particularly among Italian participants.

3.2 Skills and Competences for Sustainable Futures

The skills students identified as crucial for their futures strongly aligned with transversal, interdisciplinary, and affective competencies. These include:

- Critical thinking: Universally emphasized, particularly in Greece and Italy, as essential for questioning dominant narratives and systems.
- Collaboration and communication: Viewed as vital for future educators and changemakers, especially in the Greek and German contexts.
- Digital and media literacy: Highlighted by Greek and Portuguese students, acknowledging the centrality of tech-savviness in navigating both education and sustainability challenges.
- Ethical leadership and empathy: Prominent in Greek narratives, aligning with a values-based vision of educational professionalism.
- Creativity and innovation: Especially emphasized in Greece and Germany in connection with project-based learning (e.g., designing sustainability interventions).
- Resilience and adaptability: Seen as necessary for coping with uncertainty and change—both environmental and institutional.
- German students stressed the importance of self-structured learning, autonomy, and ambiguity tolerance—skills rarely emphasized in traditional pedagogical models. This reflects an evolving understanding of "learning to learn" as foundational to sustainable education.

3.3 Pedagogical Approaches and Project-Based Learning

The DISC project methodology—particularly its use of Design Thinking, SDG Explorer tools, and DBCL (Digital-Based Collaborative Learning)—was widely praised for enabling student agency, creativity, and relevance. Greek students described it as empowering and contextually grounded, allowing them to engage in culturally specific sustainability challenges such as wildfires, refugee inclusion, and tourism impacts.





The SDG Explorer tool was particularly appreciated in Greece and Portugal for linking global goals with local realities and enabling data-informed decision-making. The project-based approach helped students "make abstract ideas tangible," bridging the oft-lamented gap between theory and practice.

Italian and Portuguese students appreciated interdisciplinary and collaborative elements but also pointed to inconsistencies in educator training and institutional commitment. The Italian group called for more radical and grassroots interpretations of sustainability, emphasizing the need for structural change rather than pedagogical tinkering.

3.4 Perceived Role of ESD in Curriculum and Institutions

Students in all countries viewed ESD as relevant, yet its institutionalization was described as partial or uneven. At IPLeiria (Portugal), ESD is formally embedded through alliances such as RUN-EU and Eco-Schools, and students were deeply involved in ESD through research, clubs, and coursework.

In Greece, although ESD is not yet structurally embedded at all levels, students described growing awareness and momentum, particularly through project work and faculty encouragement. Students there articulated ESD as a moral and professional imperative, tightly linked to policy advocacy and future-oriented educational transformation.

German and Italian students, however, were more skeptical. In Germany, students praised the DISC project's "creative freedom" but noted that ESD was often introduced as "innovative" rather than "integrated". Italians described a gap between policy aspirations and classroom practice, often due to educator hesitation or institutional inertia.

3.5 ESD as Ethical, Political, and Cultural Practice

Beyond curricular concerns, students positioned ESD within broader ethical and political frames. Greek students in particular saw it as:

- A tool for social justice and equity
- A response to Mediterranean-specific environmental crises
- A means to preserve cultural heritage through sustainable practices
- They viewed educators as ethical role models and sustainability as a core value, not a technical skill. Similarly, Italian students questioned neoliberal appropriations of "development," suggesting that the term's colonial baggage limits its transformative potential.
- This critical literacy around sustainability language suggests that ESD, for some students, is more than education about sustainability-it's education as transformation, requiring reflexivity, deconstruction of dominant ideologies, and ethical commitment.

3.6 Assessment of Learning Outcomes and Methodological Innovation

Students emphasized the value of formative, participatory, and portfolio-based assessment methods. Greek and Portuguese students particularly appreciated:

- Reflective portfolios that integrated personal growth with academic rigor
- Rubrics aligned with SDG competences, such as ethical reasoning and systems thinking
- Peer-to-peer feedback and co-designed evaluation tools, fostering mutual learning





- Real-world metrics, such as carbon footprint reductions or community engagement, as more authentic than traditional grading
- German students expressed a preference for process-oriented evaluations, praising the continuity of learning across semesters rather than fragmented knowledge delivery.
- Italian students, while less exposed to advanced assessment models, highlighted the need for consistency and clarity in learning expectations, and warned against tokenistic ESD inclusion without genuine outcome tracking.

3.7 Barriers and Tensions

Several cross-cutting tensions emerged:

- Theory vs. practice: Students valued action-oriented learning but lamented the frequent theoretical framing of sustainability without tangible application.
- Educator readiness: The lack of systematic teacher training in ESD was noted across all contexts as a barrier to implementation.
- Conceptual ambiguity: Terms like "development" were critiqued for their ideological bias, while "sustainability" was often perceived as vague or politically compromised.
- Institutional unevenness: Commitment to ESD varied not only across countries but also within institutions, depending largely on individual educators.
- These barriers suggest that for ESD to thrive, a systemic commitment is needed beyond project funding and isolated best practices.

3.8 Comparative and Contextual Reflections

- Greek students emerged as the most politically engaged and pedagogically reflective, integrating ESD with a vision of democratic education, advocacy, and professional ethics.
- Portuguese students demonstrated strong institutional alignment and practical engagement, with clear connections between coursework, research, and sustainability values.
- German students emphasized structural and meta-cognitive skills (ambiguity tolerance, project design) while also calling for more cohesion in sustainability programming.
- Italian students brought a decolonial and critical lens to ESD, questioning mainstream sustainability discourse and calling for radical redefinitions of development itself.
- These variations reflect different national traditions, institutional cultures, and levels
 of ESD maturity. But they also show a shared desire for education that is not only
 sustainable but transformative—grounded in justice, criticality, and global-local
 responsiveness.

3.9 Implications

This analysis of student voices from the DISC project reveals that ESD, when meaningfully integrated, can foster powerful forms of learning—interdisciplinary, action-oriented, and value-driven. Students across Europe are not passive recipients of sustainability discourse; they are actively shaping, critiquing, and enriching its meaning.





However, the integration of ESD into higher education remains fragmented and, at times, superficial. Institutional inertia, conceptual ambiguity, and educator preparedness continue to impede transformative practice. Moving forward, the following recommendations are crucial:

1. Teacher Education Reform: Embed ESD principles into teacher training programs, focusing on systems thinking, ethical leadership, and participatory pedagogy.

2. Institutional Alignment: Link ESD goals with strategic plans, faculty development, and student services to ensure coherence and accountability.

3. Critical Pedagogy: Encourage decolonial, justice-centered interpretations of sustainability that reflect student critiques and aspirations.

4. Innovative Assessment: Expand use of formative, competency-based evaluation tools that recognize personal growth, impact, and collaboration.

5. Policy Coherence: Ensure national and EU education policies reflect the complexity and urgency of ESD, and provide funding to support long-term integration.

The student testimonies collected through the DISC project offer both a mandate and a blueprint for reimagining sustainability education—not as a niche domain, but as the ethical backbone of contemporary higher education.





4. CONTENT ANALYSIS OF TEACHING STAFF INTERVIEWS AND FOCUS GROUPS ON EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD)

4.1 Understanding and Familiarity with ESD

Across all participant institutions, there is a general consensus on the urgency and relevance of sustainable development. However, the depth and precision of ESD conceptualization vary:

- General Awareness, Limited Specificity: At IPLeiria, staff members were familiar with sustainability and SDGs, but few could articulate the formal principles or strategies of ESD. One professor admitted, "I share sustainability goals with my students... but I confess I don't know the strategies or the goals defined in the Education for Sustainable Development Program".
- Integrated Institutional Experience: By contrast, German participants from the University of Kassel and the Evergreen project demonstrated a high-level engagement with ESD, grounded in long-standing institutional policies. Professors were linked to specific SDGs, and sustainability was embedded into service learning and interdisciplinary collaboration.
- Deep Technical Framing: At the University of Novi Sad (Serbia), engineering faculty members framed ESD as an essential framework for sustainable systems design, emphasizing lifecycle assessment, circular economy, and Industry 4.0 as critical vehicles for sustainability education.
- Skeptical but Engaged: Some Italian academics expressed interest tempered by institutional inertia. ESD is often an "individualized initiative," lacking structural support and formalization.
- Philosophically Rich Interpretations: Greek faculty from AUTH offered deeply interdisciplinary and philosophical readings of ESD, rooted in ecological ethics, global citizenship, and pluralistic pedagogies. Participants referenced the Brundtland Report, policy debates, and the contested nature of the term "development" itself.

Across contexts, ESD is viewed as both an imperative and a concept in flux, requiring continual redefinition and contextualization.

4.2 Institutional Integration of ESD

A significant thematic divergence emerged regarding how institutions integrate ESD into their educational structures:

- Formalized Integration: Institutions like Kassel (Germany) and IPLeiria (Portugal) showed concrete institutional alignment. At IPLeiria, ESD appears across curricula and institutional practices (Eco-Schools, healthy campus projects, sustainabilityoriented master's degrees).
- Partial and Person-Dependent Integration: Many Italian and SMART focus group participants reported that ESD integration depends largely on individual professors. The lack of top-down strategy leads to fragmented implementation and inconsistency across departments.
- Decentralized but Evolving: At Novi Sad, ESD is integrated through specific engineering courses and research projects, though there's acknowledgment that curricular reform remains slow and uneven.


• AUTH's Multilayered Response: Thessaloniki's AUTH stands out for its systemic yet pluralistic approach. Multiple postgraduate programs explicitly align with SDGs, and faculty from fields as varied as cinema, medicine, and law contribute to sustainability education. Yet even here, participants noted the lack of empirical studies and called for more implementation-focused research.

Thus, institutional commitment ranges from full curricular integration to scattered, personality-driven initiatives. Structural supports like interdisciplinary programs, sustainability offices, and campus initiatives (e.g., greening, recycling, carbon tracking) play a critical role in normalization.

4.3 Pedagogical Practices and Methodologies

The most vivid and recurrent theme is pedagogy—how educators are trying to teach sustainability in meaningful, context-sensitive ways.

a. Active and Experiential Learning

Across all regions, hands-on, real-world, and participatory methods were preferred: Fieldwork and Case Studies: Teachers at SMART and AUTH emphasized using field visits, applied agricultural tasks, and management simulations to contextualize sustainability in environmental and industrial settings.

Project-Based Learning (PBL): Serbian and German educators employed PBL to address complex, real-life sustainability issues, such as supply chain optimization or CO₂ reduction. Problem-Based Learning (PBL) and Case-Based Learning (CBL) were especially prevalent in health sciences, law, and engineering, where complex ethical and environmental dilemmas

are discussed in depth.

b. Interdisciplinarity

AUTH and German institutions prominently promoted interdisciplinarity, not just in curriculum but in practice. For instance, Greek educators linked climate change to social justice, legal equity, and cultural preservation, offering transdisciplinary assignments involving policy critique and creative design.

c. Values-Oriented Pedagogy

In AUTH and Kassel, pedagogy is not only about competence-building but also values transformation. Ethical reasoning, civic responsibility, and ecological empathy are framed as learning outcomes—though participants acknowledged the pedagogical risk of appearing prescriptive.

4.4 Assessment of ESD Learning Outcomes

Assessment remains a complex and underdeveloped area:

- Traditional Grading with Sustainable Content: At IPLeiria, sustainability is often assessed within general subject evaluations, such as tests or project reports. ESD-specific learning is not independently evaluated but subsumed within broader course objectives.
- Reflective and Process-Based Assessment: Some German and Greek faculty mentioned using portfolios, reflection journals, or project outputs to assess





sustainability-oriented thinking. However, few have systematic or competency-based rubrics.

- Student-Driven KPIs: In the Evergreen project, students were encouraged to define their own learning outcomes, using Key Performance Indicators (KPIs) for sustainability, supported by coaching and peer assessment.
- Interdisciplinary Projects as Assessment: AUTH faculty assess sustainability competences through team projects tackling SDGs, linking theory to local societal needs (e.g., energy audits, biodiversity mapping).

Assessment strategies reflect both innovation and uncertainty, with many educators calling for clearer frameworks, without sacrificing flexibility and learner agency.

4.5 Challenges and Structural Constraints

While the faculty enthusiasm for ESD is strong, numerous structural, cultural, and pedagogical challenges are identified:

a. Institutional Fragmentation

ESD depends largely on individual champions.

Few institutions have a centralized strategy or mandatory guidelines.

Administrative and leadership buy-in is variable (e.g., UDE's Aurora network lacks top-down coherence).

b. Time and Curriculum Constraints

Educators struggle to fit ESD into overcrowded syllabi. In fields like law and medicine, introducing sustainability competes with technical content.

c. Lack of Educator Training

Many participants emphasized the need for continuous professional development in sustainability pedagogy, especially in fields like health sciences, economics, and the arts, where ESD is underrepresented.

d. Epistemological Ambiguity

Several participants, particularly in Greece and Italy, pointed to the vagueness of "sustainable development" as a theoretical construct. Without definitional clarity, ESD risks becoming symbolic or technocratic, detached from critical and transformative roots.

4.6 Examples of ESD-Oriented Programs and Innovations

Multiple examples were shared of sustainability-infused academic programs and courses:

- IPLeiria's Master's in Sustainable Tourism and Blue Circular Economy.
- AUTH's Postgraduate Environmental Protection & Sustainable Development Program.
- University of Novi Sad's Environmental Engineering degrees and planned Sustainable Project Management program.
- Food Technology programs in Italy integrating by-product reuse and food chain sustainability.





German micro-courses and institutional sustainability plans under the Evergreen • project.

These demonstrate that while institutional integration may be uneven, impactful models exist for replication and scaling.

4.7 Knowledge, Skills, and Attitudes in ESD

Across datasets, a robust triad of learning goals emerged, aligned with UNESCO's ESD framework:

a. Knowledge

- Systems thinking
- Life cycle analysis
- SDG literacy
- Socio-economic and ecological interdependence

b. Skills

- Critical thinking
- Scenario planning
- Multidisciplinary teamwork
- Reflective inquiry
- Civic engagement

c. Attitudes

- Ethical reasoning
- Environmental stewardship
- Cultural respect
- Empathy and collective responsibility
- Courage to act

AUTH faculty offered a particularly thorough articulation of these domains, noting that sustainability education must move learners "beyond reducing unsustainability" toward envisioning radically different futures.

4.8 Implications and Recommendations

From the evidence provided, several clear priorities emerge:

1. Strategic Institutional Alignment

Universities need central ESD frameworks that transcend departmental silos. Leadership support and policy mandates (e.g., SDG-linked course accreditation) are essential.

2. Educator Support and Training

Educators across disciplines require training in sustainability pedagogy, scenario planning, interdisciplinary collaboration, and values-based learning.

3. Coherent Assessment Frameworks

There's a need to develop flexible, context-sensitive assessment tools that can capture ESDrelated competences without reducing them to checklists.

4. Cross-Sectoral Partnerships





Universities should work with local communities, industries, and municipalities to co-create sustainability initiatives that are place-based and applied.

5. Critical and Transformative Approaches

ESD must be protected from technocratic reduction. Critical pedagogy, decolonial frameworks, and systems change literacy must underpin sustainability teaching, particularly in the Global North.

Faculty across Europe recognize the urgency of embedding Education for Sustainable Development within higher education. The data show a rich array of pedagogical practices, critical reflections, and structural innovations—but also reveal fragmentation, inconsistency, and lack of systemic support. The vision of ESD that emerges is not merely instructional but transformational: one that sees education as a vector for ecological literacy, ethical commitment, and democratic renewal. For that vision to materialize, structural coherence, faculty empowerment, and policy-level coordination are essential.



DISC

Developing Innopreneurship, Sustainability and Culture



5. SHORT COMPARATIVE REPORT FROM THE FOCUS-GROUPS ANALYSIS ON EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD)

This comparative report presents an in-depth analysis of Education for Sustainable Development (ESD) as perceived and practiced by university students and teaching staff across multiple European higher education institutions. Drawing from extensive interview and focus group data collected through the European project DISC (Developing Innopreneurship, Sustainability and Culture), the report identifies converging and diverging perspectives between learners and educators on ESD familiarity, integration, pedagogy, and assessment.

Both students and faculty demonstrated a strong commitment to sustainability and an appreciation of the critical role education plays in fostering sustainability competencies. However, differences emerged in conceptual clarity, institutional support, methodological preferences, and the perceived transformative potential of ESD. While students often brought enthusiasm and political engagement to the discussion, many teaching staff emphasized practical constraints, curricular overload, and institutional fragmentation.

The report concludes with evidence-based recommendations for policy-makers, curriculum designers, and educational leaders to support a systemic and transformative integration of ESD in higher education.

5.1 Introduction

Education for Sustainable Development (ESD) has gained prominence as a pedagogical response to global ecological, social, and economic challenges. Recognized in UNESCO's ESD for 2030 framework (UNESCO, 2020), ESD promotes competencies such as critical thinking, systems thinking, and collaborative problem-solving that are essential for creating a more just and sustainable world. This report offers a comparative analysis of how students and teaching staff across diverse European contexts perceive and implement ESD, based on qualitative data from the DISC project.

5.2 Methodology

The analysis is based on six student focus groups and interviews and six faculty focus groups and interviews conducted across institutions in Greece, Germany, Portugal, Italy, and Serbia. The qualitative content analysis employed thematic coding using an inductive-deductive approach (Mayring, 2014). The triangulation of participant groups ensured the validity of findings.

5.3 Understanding and Familiarity with ESD

5.3.1 Students' Perspectives

Students exhibited a high degree of awareness of the Sustainable Development Goals (SDGs) and demonstrated enthusiasm toward sustainability as a value and practice. In Greece and Portugal, students articulated ESD as a transformative and ethical responsibility (Sterling, 2010). Some Italian students critically examined the term "development," arguing for decolonial and post-growth perspectives (Escobar, 2015).

5.3.2 Teaching Staff's Perspectives

Faculty familiarity ranged from basic awareness to deep engagement. Portuguese and German institutions demonstrated institutionalized approaches to ESD, while Italian and





Serbian contexts revealed a dependence on individual educators. Staff members frequently expressed a need for clearer definitions and strategies for integrating ESD systematically.

5.4 Institutional Integration of ESD

5.4.1 Students' Experiences

Students often perceived institutional support as partial or inconsistent. They valued programs like Design Thinking and SDG Explorer but called for more formalized curricular pathways that ensure ESD's presence across disciplines.

5.4.2 Staff Reflections

Faculty members at Kassel and IPLeiria reported more structured ESD integration. In contrast, others noted the absence of university-wide strategies. Staff emphasized that ESD implementation often depended on personal initiative and leadership support, echoing findings from Barth et al. (2007).

5.5 Pedagogical Approaches

5.5.1 Students' Engagement

Students overwhelmingly favored active, project-based, and community-connected learning approaches (Kolb, 1984; Thomas, 2009). They highlighted the motivational power of working on real-world sustainability challenges, citing tools such as personas, simulations, and digital platforms.

5.5.2 Faculty Methods

Faculty also preferred experiential and participatory pedagogies, including fieldwork, design projects, and interdisciplinary teaching. However, some staff expressed uncertainty about the balance between values-based education and academic neutrality (Wals & Jickling, 2002).

5.6 Assessment Practices

5.6.1 Students' Feedback

Students expressed a desire for recognition of sustainability competencies in assessments, especially in relation to creativity, leadership, and collaboration. They valued portfoliobased evaluations and peer feedback but noted a lack of transparency in grading ESD components.

5.6.2 Staff Approaches

Educators reported a lack of dedicated assessment frameworks for ESD. In most cases, ESDrelated learning was embedded within general course evaluations. Institutions like Kassel experimented with student-led KPIs and project outcomes, but such practices were not widespread.

5.7 Competency Development

Both groups recognized ESD's potential to foster knowledge, skills, and attitudes aligned with UNESCO's Key Competencies for Sustainability (UNESCO, 2017). Students emphasized ethical reasoning, systems thinking, and cultural awareness. Faculty underlined problem-solving, collaboration, and critical reflection. Attitudes such as responsibility, care, and action competence were frequently highlighted.

5.8 Challenges and Tensions





Shared challenges include:

- 1. Curriculum overload and time constraints
- 2. Conceptual ambiguity and definitional variance
- 3. Uneven institutional commitment
- 4. Limited educator training and support

Students more frequently raised concerns about political co-optation of ESD and the need for transformative learning. Faculty emphasized structural constraints and the risk of tokenism in ESD implementation.

5.9 Comparative Analysis

comparative rubie. Studen	t vs. rucuity r crspcctives on LSD	
Category	Students	Faculty
Familiarity	High awareness, critical	Ranges from minimal to
	engagement	deep understanding
Institutional Support	Often partial or	Dependent on leadership
	inconsistent	and individual initiative
Pedagogy	Favor project-based, digital,	Embrace active methods,
	experiential methods	emphasize realism and
		feasibility
Assessment	Desire recognition of soft skills	Often integrated within
	and SDG alignment	general assessments,
		limited formal tools
Competencies	Emphasize ethics, creativity,	Emphasize systems
	activism	thinking, collaboration,
		interdisciplinary skills
Constraints	Political skepticism, lack of	Curriculum rigidities,
	systemic reform	institutional inertia

Comparative Table: Student vs. Faculty Perspectives on ESD

5.10 Recommendations

- 1. Policy Alignment: Develop national and institutional frameworks mandating ESD integration across disciplines.
- 2. Educator Training: Establish professional development programs to equip staff with ESD-specific pedagogies.
- 3. Curriculum Reform: Promote cross-disciplinary modules, project-based learning, and SDG-linked content.
- 4. Assessment Innovation: Create formative, portfolio-based, and competency-oriented assessment tools.
- 5. Student Agency: Involve students in co-designing sustainability curricula and institutional practices.
- 6. Community Partnerships: Encourage local sustainability projects that bridge academia and society.
- 7. Research and Monitoring: Fund longitudinal studies on ESD effectiveness in learning outcomes.
- 8. Digital Tools and Platforms: Scale up the use of interactive tools such as SDG Explorers and online labs.





- 9. Ethical Literacy: Incorporate value-based reflection and ethical reasoning into all disciplines.
- 10. Structural Coherence: Establish sustainability offices or ESD coordinators to facilitate whole-institution approaches.

5.11 Conclusion

The comparative insights from student and faculty voices in the DISC project reveal both the opportunities and limitations of ESD implementation in European higher education. While there is evident alignment in the value placed on sustainability, divergent experiences point to a need for systemic change, guided by inclusive, participatory, and transformative educational frameworks. The findings support the argument that ESD must move from being a peripheral discourse to a central pillar in higher education, if institutions are to meaningfully contribute to the SDGs and a sustainable future.



DISC

Developing Innopreneurship, Sustainability and Culture



6. REFERENCES

- Adomßent, M., and Michelsen, G. (2006). German Academia heading for sustainability? Reflections on policy and practice in teaching, research and institutional innovations. *Environ. Educ. Res.* 12, 85–99. doi: 10.1080/13504620500527758
- Altbach, P. G. (2008). "The complex roles of universities in the period of globalization," in *Higher Education in the World 3–Higher Education: New Challenges and Emerging Roles for Human and Social Development*, ed Global University Network for Innovation (London: Palgrave Macmillan), 5–14.
- Barth, M., Godemann, J., Rieckmann, M., & Stoltenberg, U. (2007). Developing key competencies for sustainable development in higher education. International Journal of Sustainability in Higher Education, 8(4), 416-430.
- Bauer M, Rieckmann M, Niedlich S and Bormann I (2021) Sustainability Governance at Higher Education Institutions: Equipped to Transform? *Front. Sustain.* 2:640458. doi: 10.3389/frsus.2021.640458
- Bauer, M., Niedlich, S., Rieckmann, M., Bormann, I., and Jaeger, L. (2020). Interdependencies of culture and functions of sustainability governance at higher education institutions. *Sustainability* 12:2780. doi: 10.3390/su12072780
- Bolden, R., Petrov, G., and Gosling, J. (2009). Distributed leadership in higher education: rhetoric and reality. *Educ. Manage. Administr. Leadersh.* 37, 257–277. doi: 10.1177/1741143208100301
- Brundiers, K., Barth, M., Cebrián, G., Cohen, M., Diaz, L., Doucette-Remington, S., et al. (2021). Key competencies in sustainability in higher education—toward an agreed-upon reference framework. *Sustain. Sci.* 16, 13–29. doi: 10.1007/s11625-020-00838-2
- Davis, H., and Goedegebuure, L. (2017). "Governance for sustainability in higher education," in *Ethics in Higher Education: Values-Driven Leaders for the Future*, eds D. Singh and C. Stückelberger (Geneva: Globethics.net Education Ethics), 217–230.
- de Haan, G. (2010). The development of ESD-related competencies in supportive institutional frameworks. *Int. Rev. Educ.* 56, 315–328. doi: 10.1007/s11159-010-9157-9
- Disterheft, A., Caeiro, S., Azeiteiro, U. M., and Leal Filho, W. (2015). Sustainable universities – a study of critical success factors for participatory approaches. *J. Clean. Product*. 106, 11–21. doi: 10.1016/j.jclepro.2014.01.030
- Escobar, A. (2015). Degrowth, postdevelopment, and transitions: a preliminary conversation. Sustainability Science, 10(3), 451–462.
- Fadeeva, Z., and Mochizuki, Y. (2010). Higher education for today and tomorrow: university appraisal for diversity, innovation and change towards sustainable development. *Sustain. Sci.* 5, 249–256. doi: 10.1007/s11625-010-0106-0
- Fazey, I., Schäpke, N., Caniglia, G., Hodgson, A., Kendrick, I., Lyon, C., et al. (2020). Transforming knowledge systems for life on Earth: visions of future systems and how to get there. *Energy Res. Soc. Sci.* 70:101724. doi: 10.1016/j.erss.2020.101724
- Ferrer-Balas, D., Adachi, J., Banas, S., Davidson, C. I., Hoshikoshi, A., Mishra, A., et al. (2008).
 An international comparative analysis of sustainability transformation across seven universities. *Int. J. Sustain. Higher Educ.* 9, 295–316. doi: 10.1108/14676370810885907
- Giesenbauer, B. and Müller-Christ, G. (2020). University 4.0: promoting the transformation of higher education institutions toward sustainable development. *Sustainability* 12:3371. doi: 10.3390/su12083371





- Giesenbauer, B., and Tegeler, M. (2020) "The transformation of higher education institutions towards sustainability from a systemic perspective," in *Universities as Living Labs for Sustainable Development*, eds W. Leal Filho, A. L. Salvia, R. W. Pretorius, L. L. Brandli, E. Manolas, F. Alves, U. Azeiteiro, J. Rogers, C. Shiel, A. Do Paco (Cham: Springer International Publishing), 637–650.
- Glasser, H. (2005). The sustainability challenge: higher education for a higher purpose. *Heartstone*. 6, 23–31.
- Helling, K. (2018). "Environmental campus Birkenfeld—a role model for universities on how to contribute to the implementation process of the sustainable development goals," in *World Sustainability Series, Handbook of Sustainability Science and Research, Vol. 24*, ed W. Leal Filho (Cham: Springer International Publishing), 539–551. doi: 10.1007/978-3-319-63007-6_33
- Hoover, E., and Harder, M. K. (2015). What lies beneath the surface? The hidden complexities of organizational change for sustainability in higher education. *J. Clean. Product.* 106, 175–188. doi: 10.1016/j.jclepro.2014.01.081
- Kolb, D. A. (1984). Experiential learning: Experience as the source of learning and development. Prentice-Hall.
- Leal Filho, W., Shiel, C., Paço, A., Mifsud, M., Veiga Ávila, L., Londero Brandli, L. L., et al. (2019). Sustainable development goals and sustainability teaching at universities: falling behind or getting ahead of the pack? *J. Clean. Product.* 232, 285–294. doi: 10.1016/j.jclepro.2019.05.309
- Lotz-Sisitka, H., Wals, A. E. J., Kronlid, D., and McGarry, D. (2015). Transformative, transgressive social learning: rethinking higher education pedagogy in times of systemic global dysfunction. *Curr. Opin. Environ. Sustain.* 16, 73–80. doi: 10.1016/j.cosust.2015.07.018
- Lozano, R., Ceulemans, K., Alonso-Almeida, M., Huisingh, D., Lozano, F. J., Waas, T., et al. (2015). A review of commitment and implementation of sustainable development in higher education: results from a worldwide survey. *J. Clean. Product.* 108, 1–18. doi: 10.1016/j.jclepro.2014.09.048
- Mayring, P. (2014). Qualitative content analysis: theoretical foundation, basic procedures and software solution. Klagenfurt.
- Michelsen, G. (2016). Policy, politics and polity in higher education for sustainable development. In: *Routledge Handbook of Higher Education for Sustainable Development*, eds M. Barth, G. Michelsen, I. Thomas, M. Rieckmann (Routledge), 40–55.
- Moore, G. Corporate social and financial performance: An investigation in the U.K. Supermarket industry. J. Bus. Ethics 2001, 34, 299–315.
- Niedlich, S., Kummer, B., Bauer, M., Rieckmann, M., and Bormann, I. (2019). Cultures of sustainability governance in higher education institutions: a multi-case study of dimensions and implications. *Higher Educ. Q.* 74, 373–390. doi: 10.1111/hequ.12237
- Orr, D. (1991). What is education for? Six myths about the foundations of modern education and six new principles to replace them. The Learning Revolution, 52–57. Available online at: <u>https://www.eeob.iastate.edu/classes/EEOB-</u>

<u>590A/marshcourse/V.5/V.5a%20What%20Is%20Education%20For.htm</u> (accessed April 12, 2021).

Purcell, W. M., Henriksen, H., and Spengler, J. D. (2019). Universities as the engine of transformational sustainability toward delivering the sustainable development goals:



DISC

DISC Developing Innopreneurship, Sustainability and Culture

"living labs" for sustainability. *Int. J. Sustain. Higher Educ.* 20, 1343–1357. doi: 10.1108/IJSHE-02-2019-0103

- Rieckmann, M. (2012). Future-oriented higher education: which key competencies should be fostered through university teaching and learning? *Futures* 44, 127–135. doi: 10.1016/j.futures.2011.09.005
- Schmitt, C. T., and Palm, S. (2018). "Sustainability at German universities: the university of Hamburg as a case study for sustainability-oriented organizational development," in *World Sustainability Series, Handbook of Sustainability Science and Research*, Vol. 43, ed W. Leal Filho (Cham: Springer International Publishing), 629–645. doi: 10.1007/978-3-319-63007-6_39
- Shephard, K.; Furnari, M. Exploring what university teachers think about education for sustainability. Stud. High. Educ. 2013, 38, 1577–1590.
- Singer-Brodowski, M., Brock, A., Etzkorn, N., and Otte, I. (2018). Monitoring of education for sustainable development in Germany – insights from early childhood education, school and higher education. *Environ. Educ. Res.* 25, 492–507. doi: 10.1080/13504622.2018.1440380
- Singer-Brodowski, M., Etzkorn, N., and von Seggern, J. (2019). One transformation path does not fit all – insights into the diffusion processes of education for sustainable development in different educational areas in Germany. *Sustainability* 11:269. doi: 10.3390/su11010269
- Sterling, S. (2004). "Higher education, sustainability, and the role of systemic learning," in Higher Education and the Challenge of Sustainability: Problematics, Promise, and Practice, eds P. B. Corcoran and A. E. J. Wals (Dordrecht: Kluwer Academic Publishers), 49–70.
- Sterling, S. (2010). Transformative learning and sustainability: sketching the conceptual ground. Learning and Teaching in Higher Education, (5), 17-33.
- Sterling, S. (2011). Transformative learning and sustainability: sketching the conceptual ground. *Learn. Teach. Higher Educ.* 5, 17–33.
- Sterling, S. (2013). "The sustainable university: challenge and response," in *The Sustainable University. Progress and Prospects*, eds S. Sterling, L. Maxey, and H. Luna (London: Routledge), 17–50.
- Thomas, I. (2009). Critical thinking, transformative learning, sustainable education, and problem-based learning in universities. Journal of Transformative Education, 7(3), 245–264.
- Trencher, G., Yarime, M., McCormick, K. B., Doll, C. N. H., and Kraines, S. B. (2014). Beyond the third mission: exploring the emerging university function of co-creation for sustainability. *Sci. Public Policy* 41, 151–179. doi: 10.1093/scipol/sct044
- UNESCO. (2017). Education for Sustainable Development Goals: Learning Objectives. Paris: UNESCO.
- UNESCO. (2020). ESD for 2030: Education for Sustainable Development: A Roadmap. Paris: UNESCO.
- Vogt, M., and Weber, C. (2020). The role of universities in a sustainable society. Why valuefree research is neither possible nor desirable. *Sustainability* 12:2811. doi: 10.3390/su12072811





- Wals, A. E. J., & Jickling, B. (2002). "Sustainability" in higher education: From doublethink and newspeak to critical thinking and meaningful learning. International Journal of Sustainability in Higher Education, 3(3), 221–232.
- Wals, A. E. J., Tassone, V. C., Hampson, G. P., and Reams, J. (2016). "Learning for walking the change: eco-social innovation through sustainability-oriented higher education," in *Routledge Handbook of Higher Education for Sustainable Development*, eds M. Barth, G. Michelsen, M. Rieckmann, and I. Thomas (London: Routledge), 25–39.
- Zilahy, G., and Huisingh, D. (2009). The roles of academia in regional sustainability initiatives. *J. Clean. Product*. 17, 1057–1066. doi: 10.1016/j.jclepro.2009.03.018





7. ANNEX

7.1 WP2 stocktaking questionnaire (consolidated version)

The European project **DISC** (Developing Innopreneurship, Sustainability and Culture/2022-1-DE01-KA220-HED-000087131) crosses the borders of scientific disciplines and societal sectors (education, sustainability, culture) and aims to support the introduction of the new EU policies like the Green Deal. The project aims to develop certified academic courses for Education, Business and Tourism professionals on ECTS levels 6 & 7, to improve the teaching and research in Cultural, Educational, Touristic, Business and Innopreneurship studies, and to explore and develop study concepts for new scientific and interdisciplinary study domains.

The **questionnaire** at hand aims to collect information regarding the existing culture and the various approaches of education for sustainable development in European higher education institutions, and how this culture may project on the curricula, along with some good practice examples of sustainable development.

Given your role in academia, you have been selected as one of the respondents for our survey. Your opinions are very important for our survey. We ask 10 minutes of your time to answer our survey. There are no right or wrong answers. Please give us your honest opinions, and fill out the questionnaire completely (you can also stop answering the survey at any point, and resume it later).

Your privacy is important to us. We want to assure you that your responses are confidential. Data will be treated in aggregate form only.

Part I. Demographics

Q1. I am a university student [closed question/choose box]

[closed question/drop-down list - teaching topic/s - social sciences, medical sciences, natural sciences, engineering, economics, arts and media, tourism]

I am academic/teaching staff [closed question/choose box]

[closed question/drop-down list - teaching topic/s – social sciences, medical sciences, natural sciences, engineering, economics, arts and media, tourism]

Q2. Affiliation [university name-open question]

Q3. Country [closed question/drop-down list]

Please, rate from 1 to 5, where 1 means "not at all familiar" and 5 "very familiar"

Q4. Familiarity to ESD	1	2	3	4	5
How familiar are you with the terms 'Education for Sustainable Development'					
(ESD) or 'Education for Sustainability'?					

Part II. Defining Education for Sustainable Development

Please, rate each of the following statements from 1 to 5, where 1 means "totally disagree" and 5 "totally agree"			
Q5. Education for Sustainable Development or Education for 1	2 3	4	5
Sustainability (ESD)			
ESD allows—to acquire the knowledge, skills, attitudes and values necessary to shape an environmentally friendly future.			
ESD means including key sustainable development issues into teaching and learning (for example, climate change, disaster risk reduction, biodiversity, poverty reduction, and sustainable consumption) fostering the multidisciplinarity of sustainability			
ESD requires participatory teaching and learning methods that motivate and empower learners to change their behaviour and take action for social development.			
ESD requires far-reaching changes in the way education is often practised today.			
ESD is essential for the achievement of a sustainable society and is therefore desirable at all levels of formal education and training, as well as in non-formal and informal learning.			
ESD enables people to develop the knowledge, values and skills to participate in decisions about the way we do things individually and collectively, both locally and globally, that will improve the quality of life now without damaging the planet for the future.			





ESD blends a range of pedagogical techniques to promote an understanding of the connections among the environment, the economy and society.			
ESD has the primary goal of harnessing the power of education to advance environmental literacy and civic engagement that prepares students for jobs that contribute to a more equitable and sustainable future.			
ESD is a combination of content, learning methods, and outcomes that helps students develop a knowledge base about the environment, the economy, and society, in addition to helping them learn skills, perspectives, and values that guide and motivate them to seek sustainable livelihoods, participate in a democratic society, and live in a sustainable manner.			

Please, rate each of the following SD principles from 1 to 5, where 1 means "totally disagree" and 5 "totally agree"

Q6. Main principles	1	2	3	4	5
Transformation and change					
Education for Sustainability involves equipping people with skills, capacity and motivation to plan and					
manage change towards sustainability within an organisation, industry or community.					
Education for all and lifelong learning					
Education for sustainability is driven by a broad understanding of education and learning that includes					
people of all ages and backgrounds and at all stages of life and takes place within formal and informal					
learning places, in schools, workplaces, homes and communities					
Systems thinking					
Education for sustainability aims to equip people to understand connections between environmental,					
economic, social and political systems.					
Envisioning a better future					
Education for sustainability engages people in envisaging diverse, sustainable futures.					
Critical Thinking and Reflection					
Education for sustainability encourages individuals and groups to reflect upon personal experiences					
and worldviews, and challenges accepted ways of interpreting and engaging with the world.					
Participation					
Education for sustainability recognises community participation as critical to the collective shift					
towards an environmentally sustainable society.					
Partnerships for change					
Education for sustainability focuses on partnerships to build networks and relationships, and improve					
communication between different sectors of the community.					

Based on your teaching and/or learning experience, please rate each of the following issues as most relevant to be considered as relevant to ESD. Rate from 1 to 5, where 1 means "not at all relevant" and 5 "very relevant"

Q7. Sustainable development issues	1	2	3	4	5
Natural resources management					
Food and farming					
Ecological systems					
Waste / water / energy					
Biodiversity					
Climate change					
Alternative futures					
Leadership and change					
Learning organisations					
Corporate Social Responsibility					
Consumerism and trade					
Globalisation of economy					
Accountability and ethics					
International development					
Sustainable and ethical tourism					
Population and demography					
Sustainable communities					
Cultural diversity					
Intercultural understanding					
Sustainability in the built environment					
Indigenous & traditional communities					





Travel, transport and mobility			
Health and wellbeing			
Peace, security and conflict			
Citizenship, government, democracy			
Human rights and needs			

Part III. ESD in Higher Education (HE)

Based on your teaching/learning experience in HE, please, rate each of the following statements from 1 to 5, where 1 means "totally disagree" and 5 "totally agree"

Q8. ESD teaching and learning	1	2	3	4	5
Students and teaching staff must understand and be able to apply the basic concepts and principles of					
sustainability.					
For sustainability education to be effective, teaching staff must provide students with a foundational					
understanding of sustainability.					
Students and teaching staff must understand the relationship among economic, environmental and					
social factors in order to make informed decisions and take individual and collective action to improve					
living conditions on the planet.					
Students and teaching staff must recognize sustainability as an interdependent condition of ecological,					
economic and social systems.					
Teaching staff need to harness innovation and creativity to help students comprehend the					
complexities of the living environment.					
Students and teaching staff must develop a multidisciplinary approach to learning the knowledge, skills					
and attitudes necessary to continuously improve the health and well-being of present and future					
generations.					

Based on your teaching and/or learning experience, please rate each of the following skills and competences as most relevant to be fostered in your current curriculum. Rate from 1 to 5, where 1 means "not at all relevant" and 5 "very relevant"

Q9. Prerequisites for ESD	1	2	3	4	5
Recognize and understand relationships					
Analyze complex systems					
Think about how systems are embedded within different domains and different scales					
Deal with uncertainty					
Understand and evaluate several futures (possible, probable, and desirable					
Create one's own visions of the future					
Apply the principle of precaution					
Assess the consequences of actions					
Deal with risk and change					
Understand and reflect on the norms and values that underlie people's actions					
Negotiate sustainability values, principles, goals and targets (in contexts of conflicts of interest and concessions)					
Collectively develop and implement innovative actions that promote sustainability (locally and in wider contexts)					
Be able to learn from others					
Understand and respect other people's needs, perspectives and actions (empathy)					
Understand, relate to and be sensitive to others (empathic leadership)					
Handle group conflicts E Facilitate collaboration and participation in problem solving					
Commitment to continuous learning					
Respect for diversity					
Building trust					

Based on your teaching and/or learning experience, please rate each of the following learning outcomes as most relevant to be included in your current curriculum. Rate from 1 to 5, where 1 means "not at all relevant" and 5 "very relevant"

Q10. Learning Outcomes	1	2	3	4	5
Valuing sustainability: Transform sustainability in personal values; identify and explain how values vary among people and over time, while critically evaluating how they align with sustainability values.					
Promoting justice: To support equity and justice for current and future generations and learn from previous generations for sustainability.					





	1	1	 1	
Promoting and embracing nature: To acknowledge that humans are part of nature; and to respect the needs and rights of other species and of nature itself in order to restore and regenerate healthy and resilient ecosystems.				
Systems thinking: To approach a sustainability problem from all sides; to consider time, space and context in order to understand how elements interact within and between systems.				
Critical thinking: To assess information and arguments, identify assumptions, challenge the status quo, and reflect on how personal, social and cultural backgrounds influence thinking and conclusions.				
Problem framing: To correctly frame current or potential challenges as a sustainability issues, and assess in terms of difficulty, people involved, time and geographical scope, in order to identify suitable approaches to anticipating and preventing problems, and to mitigating and adapting to already existing problems.				
Futures literacy: To envision alternative sustainable futures by imagining and developing alternative scenarios and identifying the steps needed to achieve a preferred sustainable future				
Adaptability: To manage transitions and challenges in complex sustainability situations and make decisions related to the future in the face of uncertainty, ambiguity and risk				
Exploratory thinking: To adopt a relational way of thinking by exploring and linking different disciplines, using creativity and experimentation with novel ideas or methods				
Political agency: To navigate the political system, identify political responsibility and accountability for unsustainable behaviour, and demand effective policies for sustainability				
Collective action: To act for change in collaboration with others				
Individual initiative: To identify own potential for sustainability, actively contribute to improving prospects for the community and the planet, and develop adaptability to change own daily habits towards a more sustainable way of living.				

Based on your teaching and/or learning experience, please rate each of the following approaches as most relevant to be included in your teaching/learning context and could be included in your current curriculum. Rate from 1 to 5, where 1 means "not at all relevant" and 5 "very relevant"

Q11. Teaching and learning approaches	1	2	3	4	5
Collaborative learning - including contributions from guest speakers, work-based learning,					
interdisciplinary/ multidisciplinary working, and collaborative learning and co-inquiry.					
Thinking creatively for future scenarios – by using role- play, real-world inquiry, futures visioning,					
problem-based learning, and providing space for emergence.					
Participatory learning – with emphasis on group or peer learning, developing dialogue, experiential					
learning, action research/learning to act, and developing case studies with local community groups					
and business					
Systemic thinking and analysis – the use of real-world case studies and critical incidents, project-					
based learning, stimulus activities, and the use of the campus as a learning resource.		-			
Critical reflection – including the more traditional lecture, but also newer approaches such as reflexive					
accounts, learning journals, and discussion groups.					
Simulation and dramatisation exercises – in general provide excellent strategies for promoting the					
understanding of the options which have to be considered in making a decision on any issue,					
environmental or other.					
Problem based learning (PBL) is a student-centred educational method in which students learn about					
a subject by working in groups to solve an open-ended problem. Problem solving has its roots in the					
1970's when environmental awareness was closely linked to building public awareness on intense					
environmental problems that eventually led to ecological crises including pollution, depletion of					
Analysis and models, an affective analysis being learners activate transfer and analy existing					
Analogies and models – all effective analogy helps learners activate, transfer and apply existing					
educational intervention					
Experiments – an experiment is an activity that is conducted under controlled conditions to test a					
hypothesis to confirm a law to discover an unknown result or to induce a change to one or more					
system variables caused by internal or external factors.					
Learning through objects – this approach allows the learner, through his senses, to make a direct					
connection to the object which ultimately leads to increased interest.					
Geographical maps, graphics and other visual tools – although map skills (interpretation and drawing)					
mainly link to geography, they also concern the overall curriculum and can be further developed in					
history, social studies, literature, mathematics and naturally in ESD by educators looking for new ways					
to enhance teaching and learning methods.					
Concept maps – are used to investigate and highlight the relationships between concepts. They are					
based on the theory of constructivism according to which it is the learner himself who creates					
knowledge.					
Brainstorming and making charts – a technique used to explore spontaneous ideas generated by a					
group on any given subject in a short time.					





Working in groups – encourages learners to communicate, participate and learn to share and cooperate.			
Field visits and research – the term "field" refers to the natural, cultural and social environment including a wide range of sites (such as wetlands, coasts, streams, forests, neighbourhoods, settlements, rural, archaeological and industrial sites, etc.).			

Q12. Based on your own expertise can you mention any interesting example of a HE programme/course that is ESD relevant? You could include an example from your own institution (a title and relevant webpage is enough) [open question 2000 characters max.]

Q13. Would you be interested in participating in an online interview? [Closed question – **check box YES/NO**. If yes, please include your email for contact]

Thank you very much for your collaboration.





7.2 WP2 focus groups with students (guide)

What skills do you consider important for your future?

- How important is SD for you
- What does Education for Sustainable Development imply for you:

DISC project

- What did you like the "instructional" project approach (Design Thinking, DBCL (incl. SDG explorer), Validation.
- Evaluation of the methodology

7.3 WP2 focus groups with teaching staff (guide)

- 1. To what extent are you acquainted with the concept of 'Education for Sustainable Development' (ESD)?
- 2. Are you familiarised with the primary principles of Education for Sustainable Development (ESD)?
- 3. In what ways do you incorporate ESD principles into your teaching and learning practices?
- 4. How do you integrate ESD principles into the learning outcomes of your courses?
- 5. Can you provide an example of a higher education programme or course that is relevant to Education for Sustainable Development, based on your expertise?

