INTRODUCTION TO SUSTAINABILITY AS A TRANSVERSAL COMPETENCE IN HIGHER EDUCATION

H. Belchior-Rocha[1], V. Ramalho[2], C. Roseta-Palma[3]

[1]Iscte-Instituto Universitário de Lisboa (CIES) (PORTUGAL)
[2]Iscte-Instituto Universitário de Lisboa (PORTUGAL)
[3]BRU-Iscte -Business Research Unit (IBS) (PORTUGAL)

Abstract

Sustainability in higher education institutions is little discussed, but there is a large amount of literature that mentions its importance for the awareness of all those who frequent their spaces, whether they are teachers, employees, or students. The understanding, by the human being, of the complex nature of the environment and the perception of the interdependence of the environmental elements in space and time is crucial and, for this reason, the education in this area must be accessible to all and at all levels of education, not matter what subject area.

Since 2019, in the Soft Skills Lab of a public university was created a curricular unit called - Introduction to Sustainability, with the aim that students and everyone involved with the environment in a higher education institution can be fully aware of what it means to develop sustainability actions, both in the environment and in the very contents of the various courses developed in the institution they are a part of.

This exploratory study aims to disseminate this experience with the 1st cycle students and also with workshops made with the employees as a practice that can be replicate in other institutions. The evaluation was made through the process of pedagogical monitoring students make every semester and in the case of the employees through an evaluation survey. It was very motivating to see the commitment that both students and employees have started to show in their daily behaviour and even the creative suggestions for their participation in this matter.

Keywords: Sustainability, Higher Education, Change behavior

1 INTRODUCTION

Higher education institutions (HEIs) have an important role in preparing their students to be agents for the constant improvement of the society and in the world in general.

> The prominent role assumed by HEIs in the process of technological development, in the preparation of students and provision of information and knowledge, can and must also be used to build the development of a sustainable and fair society. For this to happen, however, it becomes indispensable that these organizations begin to incorporate the principles and practices of sustainability, whether to start an awareness-raising process at all their levels, reaching faculty, staff and students, or to make fundamental decisions about planning, training, operations or common activities in their physical areas [1].

The environment and sustainability contribute to the understanding of the relationship and interaction of humanity with the whole and the training in this area encourages a public environmental ethics regarding ecological balance and quality of life, awakening in individuals and organized social groups the desire to participate in the construction of their citizenship [2]. However, the environmental education makes higher education face challenges in the incorporation of this area of knowledge and that positions itself in the face of socio-environmental transformations.

Sustainability in higher education institutions is little discussed, but there is a large amount of literature [1], [2], [3], [4], [5], [6], [7], [8], [9], that mentions its importance for the awareness of all those who frequent their spaces, whether they are teachers, employees, or students. The understanding, by the human being, of the complex nature of the environment and the perception of the interdependence of the environmental elements in space and time is crucial and, for this reason, the education in this area must be accessible to all and at all levels of education, not matter what subject area.

It is perceived by some authors [3] that for universities to comprehensively address the topic of sustainability it is necessary to include a "learning for sustainability" approach in all aspects in a synergistic way. The main challenge of the study of sustainability and its application in HEIs according to studies already carried out, is linked to the understanding and interpretation of the term sustainability and the idea of "learning for sustainability" which vary greatly within higher education [1], [3], [5], [6], [7], [8], [10], [11]. Most HEIs have achieved only small incremental advances towards strengthening an educational agenda for the issue of sustainability, being confronted with the complexity of the subject and a built-in resistance to change [12].

Other authors [12, 13, 14] address in their research the inclusion of sustainable development in higher education educational programs. They report the experiences of respondents in working in interdisciplinary teams focused on education, research and extension, highlighting the importance of accelerating the pace at which HEIs encourage and support values, knowledge, and actions to help their students transform society, thereby achieving sustainable standards. Among the main findings is the need to engage teaching with practice and to overcome resistance to change inside and outside the academy [12,13, 14].

> The barriers faced to the incorporation of a sustainable awareness in the HEI environment often go through the sieve of thinking that sustainable development is just a fad or that it is related only to environmental issues. This difficulty in understanding what sustainable development is, is present in the institutions' top management, causing essential issues related to sustainability not to receive the necessary attention due to bureaucracy, being treated as just another administrative process, limited by economic interests [15].

Above all, one must keep in mind, that one of the goals of education is to create responsible citizens who can properly understand the problems and then act to help solve them. Such behavior can be promoted through an education that facilitates expert knowledge about social issues, promotes the ability to think critically, and enables the acquisition of the skills necessary to proactively seek possible solutions [16].

Education is the driving force for sustainability since it is one of the main communication vehicles and the basis for the “sustainability mindset” [17,18]. Includes a holistic systemic approach to understanding the basics of a healthy ecosystem beyond technical knowledge [18]. By emphasizing environmental studies, systems thinking and self-awareness, the sustainability mindset encourages us to break away from traditional disciplinary silos [17, 18].

> The promotion of interdisciplinarity as a condition for sustainability education has met with much resistance in institutions, either for administrative reasons or due to the reluctance of faculty members trained in a disciplinary view to engage with interdisciplinarity and more practical approaches related to sustainability education [14].

Since 2019, in the Soft Skills Lab of a public university was created a curricular unit called, Introduction to Sustainability, with the aim that students and everyone involved with the environment in a higher education institution can be fully aware of what it means to develop sustainability actions, both in the environment and in the very contents of the various graduations developed in the university, with the aim of create, transmit and share scientific knowledge related to Sustainability in the scientific fields of Management, Finance, Accounting, Economics, Quantitative Methods, Anthropology, Social Psychology, Sociology, Social Work, History, Political Science and Public Policies, Information Technology and Architecture, training qualified professionals with skills to understand their responsibilities and create opportunities for improvement, enhancing a positive impact on the environment, society and the economy. Later was also created a set of training workshops for the employees.

2 METHODOLOGY

This exploratory study aims to disseminate this experience with the 1st cycle students of all graduation areas and also with workshops made with the employees as a practice that can be replicate in other institutions. We choose mixed methods because it is an approach that seeks to utilize the strengths of both methodologies (quantitative and qualitative) [19]. For the quantitative data we use secondary data of the evaluation made through the process of pedagogical monitoring that students make every

semester and for qualitative data the comment's students made about their experience at the end of the course. In the case of the employees through an evaluation survey (quantitative) and also their comments (qualitative). During the academic year of 2020/21 we started with one a pilot class to see how students would adhere to this new curricular unit and 42 students applied, it was not possible to let any more students apply, usually this course has no more than 30 students. For the academic year of 2021/22 three classes opened with a total of 86 students.

This year we extend our offer under the Non-Teaching Staff Professional Training Plan by the Soft Skills Lab of our university, with a view to expanding and consolidating the training offer aimed at the University's employees, based on the training needs identified by the employees themselves. The main objective of the training module on Introduction to Sustainability was to provide trainees with a panoramic view on sustainability including the several dimensions of the concept. It is intended to strengthen their preparation to act as informed and active citizens, thus contributing to the achievement of the Sustainable Development Goals (SDGs), both in the performance of professional activity and in personal, social and family life. With a total duration of 10 hours, divided into four sessions of two and a half hours, it was disclosed via institutional email. Eleven employees from different departments and services enrolled.

3 RESULTS

3.1.1 Students Evaluation

The course contents of this curricular unit were about subjects such as: What is sustainability? Evolution of the concept/current state of knowledge; Systemic vision and interdisciplinarity; Humanity's challenges and opportunities in the perspective of sustainability; People, Planet, Prosperity, Peace and Partnerships - SDG2030; The contribution of citizens through their personal actions and their participation in institutions; Best Practices. The final work proposed to these students was a project/report made throughout the semester in which they attended this curricular unit. They could choose a theme and one or more actions to implement, that would contribute to improve environmental sustainability, with the tag "A project that you can hold in your hands".

The pedagogic monitoring has a scale from 1 to 5 (1= strongly disagree/ 5= strongly agree) and the General Satisfaction has a scale from 1 to 10 (1= totally unsatisfied/ 10= totally satisfied).

From table 1 and 2 it can be perceived that students evaluate positively this curricular unit, although we are aware that it can be improved.

Table 1. Monitoring Results 2020/2021

Year 2020/2021 (N=42)	Average	Median	Standard Deviation
This curricular unit allows us to learn a lot of new knowledge	4.5	5	0.6
This curricular unit contributes to the development of my critical sense and reflexive spirit	4.5	5	0,6
The subjects of this curricular unit are well articulated with the knowledge acquired in other curricular units	4.7	5	0,7
The assessment procedures of this curricular unit are adequate to the respective learning objectives	4.4	5	0,7
I participate in class discussions	4.1	4	0.9
Level of satisfaction with your own commitment to this course	4.3	4	0.8
General satisfaction with the curricular unit	8.7	9	1.4

Source: Iscte-Curricular Units Monitoring Process data – February 2021

Table 2. Monitoring Results 2021/2022

Year 2021/2022 (N=86)	Average	Median	Standard Deviation
This curricular unit allows us to learn a lot of new knowledge	4,7	5	0.7
This curricular unit contributes to the development of my critical sense and reflexive spirit	4.5	5	0.6
The subjects of this curricular unit are well articulated with the knowledge acquired in other curricular units	4.7	5	0,7
The assessment procedures of this curricular unit are adequate to the respective learning objectives	4,2	4	0.8
I participate in class discussions	4.3	4	0.8
Level of satisfaction with your own commitment to this course	4.4	5	0,7
General satisfaction with the curricular unit	8.8	9	1.5

Source: Iscte-Curricular Units Monitoring Process data – February 2022

The themes choosed for the final works, mainly were about issues like Sustainable Food and Biodiversity, Plastic articles, Environmental sustainability, Saving Water, Energies, Fast fashion and Eating habits. We ask student to leave a comment about on the impact that this curricular unit had on his or her education. It was not possible to leave all the comments that the students made, but it is possible in this small sample to understand the effect this curricular unit had and the change induced.

Table 3. Some Students (St.) Comments

Year 2020/2021	
St. 1	If everyone on the planet performed these actions, surely the world would be a better place with less pollution and future generations would also have a healthy planet and these activities would be a normal thing for them. When we all reuse packaging, this would not only decrease the levels of pollution related to the dumping of packaging, but would also have a consequence on the production of new packaging because the number of packages would tend to be much smaller, which means that we would not need so many natural resources to produce them.
St. 2	All these new actions taken in my daily life have been worthwhile and I can infer that it has helped me economically, environmentally, and mentally, as it has also made my head clear knowing that I contribute to the environment and to sustainable development.
St. 3	If we would all do this reflection that I have done, with little effort but with dedication, we would undoubtedly see results in the future. More and more the world population is being called upon and made aware of the need to prevent the situation from worsening so that a stable and healthy life can be established for future generations of all life on Earth. Consequently, if we act together against the common enemy, the pollution caused by ourselves, I believe that we will be able to reverse the situation.
St. 4	Carrying out this method, made me understand that it is easier than it seems to save money and be more sustainable. It doesn't take something very complex to make a difference. We see thousands of other ways how we can be more sustainable, every day, advertised as an important thing to teach the younger ones, since they are the ones who will continue the fight against the climate change that we cause.
Year 2021/2022	
St. 5	Throughout the Introduction to Sustainability classes we had during the semester I developed a critical thinking about the subject that I didn't have until now. In this thought I considered several issues such as which daily practices should cease (due to its harmfulness) and which new ones to put into practice, how impactful these changes would be in my life and how much it would benefit the planet. I felt that although they were acts that cost me initially, they would

	bring countless benefits to the planet and the most important thing is that I felt they were within my reach and only depended on my willpower (...). Another of the strong motivations to approach this theme is due to the work in which we autonomously calculated the ecological footprint, because it alerted me that something was not right. In this work I verified that the value of the index was too high and the main factor that influenced it focused on the theme at work, my food. (...) As I have heard many times about this subject, both in and out of class, and because it is such a current issue due to its importance or even urgency (due to warnings about the state of our planet), I began to reflect on whether it was really necessary to eat meat so often throughout the week and in such quantity. I decided to give it up and look for new possibilities to replace it. Decidi abrir mão da mesma e procurar novas possibilidades para a substituir.
St. 6	I have been trying more and more to be aware of the state of the world and how I can reduce my ecological footprint to contribute to its preservation. I believe that knowledge is the first step towards change, so I have been constantly readjusting who I am, what my values are, and how I can put them into practice. Consequently, sustainability has become more and more a part of me, so I have been trying to implement it more and more in my daily life and in my actions, starting by reducing my textile consumption and becoming more minimalist, reducing my animal feed, and also betting more on walking and public transport.
St. 7	I know that I still have many habits that I need to improve, but I believe that this course unit not only opened my eyes to several important topics and issues, but also motivated me to take a second look at my choices and my behaviours.
St. 8	During the course of the Introduction to Sustainability course my awareness developed, and concepts that I had heard about since 4th grade began to make sense. Whereas before I had a mostly intellectual and superficial interest in things like "global warming", the "ozone layer" and "renewable energy", soon after the first class this interest turned into a more serious and mature concern, which practically materialized in three questions: 1. is this sustainable?2. What is the most sustainable and systemic way to think about this problem?3. What is the impact of this action of mine and how can I make it more sustainable?
St. 9	The introduction to sustainability allowed me to gain more knowledge about various topics, which we cover in class. Since I attend the Architecture Course, it will be even more beneficial to design future projects and pay attention to all the surrounding factors before building. This work, more objectively, made me aware that the future is in our hands.
St. 10	At the moment I plan to give away the clothes that are in my wardrobe but I don't use anymore, I've started giving toys and games that I don't use anymore to other people who will use them, instead of them gathering dust in a drawer or in the storage room. I've started using more sustainable products in food, more rice and tomatoes, less potatoes and meat. I started to think about investing in a purchase of solar panels, since in addition to being sustainable for the environment, it is also good economically because in the long run I will be paying less money in electricity, although the initial cost is higher. I think however the most important lesson I learned was to think more proactively about my actions and the actions of people around me, think first if what I'm doing is a really "sustainable" purchase, and if I really need to buy this, and only then buy, instead of the casual attitude of seeing something cute and buy just because yes but not by necessity.

Source: Own elaboration

Based on the literature and with the data obtained we can perceive that there is no better way to teach about sustainable development than to practice it. This practice is not limited to final work in a particular subject, it is something much deeper. It involves building an environment in which students can "experience" what they have learned about sustainable development, in which they can mirror themselves and be aware of the reality that surrounds them. Education is the most appropriate and efficient instrument for any strategy that intended to reduce the negative impacts already caused to the environment by human action. This proposed path, is capable of developing future professionals who are opinion makers and with responsible attitudes towards the world in which we would like to live.

3.1.2 Employees Evaluation

Analyzing the feedback collected from the participants and through the satisfaction questionnaire filled out at the end of the training, there is a need to develop more training in the area of sustainability and innovative ways to disseminate in the academic community the knowledge of the internal sustainability policies and actions produced by our university. But this was the first experience and it is an ongoing project.

Table 4. Employees Assessment Results

Year 2021/2022 (N=11)	Didn't Corresponded	Corresponded	Totally Corresponded	Exceeded
The training met your expectations?	-	10%	-	90%
	Insufficient	Reasonable	Good	Muito Boa
A documentação disponibilizada foi: [1]	10%	-	10%	80%
	Very negative	Negative	Positive	Very positive
Relativamente à formadora, como a classifica no domínio das matérias	-	-	-	100%
	Short Term	Medium Term	Long Term	Without Term
Do you expect to apply the knowledge acquired? If yes, when?	65%	25%	-	10%
Would you recommend the training course?	100% yes			

Source: Final Report of the Introduction to Sustainability Workshop - March 2022

Table 5. Some Employees (Empl.) Comments

Year 2021/2022	
Empl. 1	Congratulations Soft Skills Lab.
Empl. 2	Good initiative that contributes to the SDG2030.
Empl. 3	Excellent initiative that will have an impact in improving the awareness of all trainees. The acquisition of knowledge was very useful and fruitful and the moments of sharing very valuable and enriching.
Empl. 4	It should be given to the heads of the various levels in addition to the employees.
Empl. 5	Continuous training in the area of sustainability is very important.
Empl. 6	I leave the suggestion that employees organize practical actions that can operationalize the training and the sustainability plan of our university and collaborate to change behaviors of the academic community.

[1] Due to the interest aroused by the training in sustainability issues the trainees requested additional documentation and suggestions for further reading that were subsequently made available by email to the entire class

4 CONCLUSIONS

It was very motivating to see the commitment that both students and employees have started to show in their daily behaviour and even the creative suggestions for their participation in this matter.

Education for sustainability is a participative and continuous process, fundamental for a critical consciousness about existing environmental problems, that we will probably always be confronted with. The concern with this issue is because we are living a moment of imbalance and disharmony, caused by all of us.

When students acquire this knowledge start behaving in an environmentally correct way, understanding the functions of the environment for the maintenance and existence of a sustainable future. In addition to practicing actions aimed at caring for the planet they live in, they learn to respect and understand the importance of environmental issues for new and future generations, reflecting on their role in maintaining environmental preservation.

Universities, therefore, have a fundamental role in disseminating information and transmitting knowledge related to sustainability, while forming young people with critical and conscious thinking, who will take the knowledge acquired to their homes and neighbourhoods, proposing ideas and solutions that will assist in sustainable development and the mitigation of damage caused so far. To do so, it is necessary that institutions are prepared to face this challenge educating them and including this curricular unit in all study plans in their first year, even if later they have other curricular units in their graduations.

Education for sustainability is a permanent and modifying instrument to promote reflections on environmental problems and to show that the quality of life and future generations depend on an informed knowledge to achieve sustainable development.

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