The Contribution of Social Sciences and Arts to the Sustainable Development Goals in Higher Education

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Abstract In this work, we analysed the mapping of the Sustainable Development Goals in the curricular units of the Social Sciences and Arts degree courses of the University of Évora. We took as reference the totality of the curricular units of Social Sciences (408) and Arts (261) degree courses existing in 2022. The data presented refer to the SDGs marked by teachers in the curricular units with the exception of SDG4 (Quality Education) previously marked by the university. The results showed that the most marked objectives in the area of social sciences were SDG5, SDG8. SDG10 and SDG16. In the Arts area, SDG3, SDG11. SDG12 and SDG13. We found statistically significant differences when comparing the Departments and also the scientific areas.

Keywords Sustainable development goals · Higher education · Social sciences · Arts

1 Introduction

The idea of sustainable development emerged in the 1980s aiming at changes in societies' behaviour towards a better balance between social, economic and environmental dimensions. The term "sustainable development" was formalised in 1987 in the Brundtland report "Our Common Future" by the World Commission on Environment and Development (Pisani, 2006; WCED, 1987). From this moment, the definition of sustainable development gains greater visibility since it highlights the development that seeks to meet the needs of the current generation without compromising the future of future generations. This allows people, now and in the future, to achieve a satisfactory level of social and economic development and human and

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cultural fulfilment based on a balanced use of natural resources and the preservation of species and natural habitats. Since then, a considerable amount of environmental legislation and a number of international agreements, in addition to the mapping of environmental change, have strongly driven global policy change in this context (Adams, 2006).

Although widely used in scientific literature, the term sustainable development reveals some diversity of concepts whose meaning varies according to the contexts and areas of application (Stepanyan et al., 2013; Yolles & Fink, 2014). Despite the lack of consensus on the concept, there is general acceptance that sustainable development is about achieving a balance between human needs and the environment and understanding the complex dynamics of interaction between the two (Barbosa et al., 2014). It also meets a consensus that it represents something positive that, in general, aims at human well-being in the long term by optimising the management of the environmental system (Seager, 2008).

Despite the diversity of approaches over the last four decades, climate change and its increasingly visible and catastrophic effects in many parts of the globe have put the issue in the spotlight. Thus, in 2015, the United Nations Summit on Sustainable Development was held in New York, which gave rise to the resolution "Transforming our world: Agenda 2030 for Sustainable Development" (Eurostat, 2017) that came into force on 1 January 2016 (UNRIC, 2016) constituting the new global sustainable development strategy. The SDGs replaced the Millennium Development Goals (MDGs), which were adopted in 2000 and were the guide for action for development until 2015 (Eurostat, 2017). The 2030 Agenda includes 17 Sustainable Development Goals (SDGs), 169 targets and 232 indicators that translate into an action plan focussed on people, the prosperity of peoples and the promotion of peace through the establishment of partnerships between developed and developing countries and different sectors that must be achieved by 2030 worldwide (European Commission, 2016). It thus aims for collaboration, mutual aid and shared responsibilities (European Commission, 2016) and, in this sense, it becomes a universal, broad and ambitious agenda (UNRIC, 2016).

The 17 Sustainable Development Goals (SDG) are presented below:

1. End poverty in all its forms everywhere.
2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
3. Ensure healthy lives and promote well-being for all at all ages.
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
5. Achieve gender equality and empower all women and girls.
6. Ensure availability and sustainable management of water and sanitation for all.
7. Ensure access to affordable, reliable, sustainable and modern energy for all.
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

10. Reduce inequality within and among countries.
11. Make cities and human settlements inclusive, safe, resilient and sustainable.
12. Ensure sustainable consumption and production patterns
13. Take urgent action to combat climate change and its impacts.
14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
17. Strengthen the means of implementation and revitalise the global partnership for sustainable development.

Regarding its priorities, Portugal has identified six strategic SDG(s) for the country's development, specifically, Quality Education, Gender Equality, Industry, Innovation and Infrastructure, Reduction of Inequalities, Climate Action and Protection of Marine Life (MNE, 2017). Although the SDGs are non-binding, it is proposed that governments take responsibility for their implementation and monitoring (Eurostat, 2017) to respond to the problems facing the world have been identified as the most urgent aspect of coverage—from eradicating poverty and hunger to strategies that promote economic growth and address social needs, including education, health, social protection and employment opportunities, to climate change and environmental protection.

The concern with sustainable development on the part of Higher Education Institutions (HEIs) dates back to 1990, when the International Conference of Talloires, France, was held with the participation of 22 university representatives. This resulted in ten action measures for higher education institutions to contribute to a more sustainable future (Talloires Declaration, 1990). In the Declaration, we read: "Universities educate the majority of people who develop and manage the higher education institutions of society. For this reason, universities have profound responsibilities in raising awareness, knowledge, technologies and tools to create an environmentally sustainable future" (p. 1). This declaration was thus the first official document signed by universities, reflecting the commitment to teach and research within the framework of sustainable development (Figueiró & Raufflet, 2015).

Higher education is seen as an essential component specifically considering SDG4, given its role in policy and education at all levels through teaching and research. Universities should try to make the most of the many opportunities that SDG(s) offer, not only in the field of teaching and research, but also in their university extension activities (Leal Filho et al., 2017, 2019). According to Bautista-Cerro Ruiz and Díaz González (2017), this commitment in universities is advancing with the help of academics (teachers and managers) who, individually, include it in their disciplines and course design.

It is in this context that universities are challenged to include the 17 Sustainable Development Goals (SDGs) in the wide range of their training provision and higher education is expected to contribute with knowledge and innovation to meet social, economic and environmental challenges through the training of both academic staff and students. Goal 4 (Quality Education), in particular, recognises the importance of education for sustainable development and some goals explicitly call for action by Higher Education Institutions, given their direct relevance in teaching and learning activities, knowledge production and skills development to meet the challenges of today's and tomorrow's world (Leicht et al., 2018). In particular, it is intended to ensure that all students acquire the knowledge and skills necessary to promote sustainable development (UNESCO, 2017). Universities occupy a privileged place in society and assume an unquestionable role in the creation and dissemination of knowledge. Over time, they have proven to be powerful drivers of local, national and global innovation, economic development and human well-being (SDSN, 2017a). Thus, the contribution of universities can be very broad, as they cover several fields such as: (i) learning and teaching, where they can provide knowledge, skills and motivation needed to understand and address the SDGs and, in general, education for sustainable development; (ii) research, through scientific production, technological solutions and innovation resulting from new national and international interdisciplinary or transdisciplinary approaches; (iii) governance, through university management and extension policies and (iv) social leadership through strengthening the university's public commitment to the implementation of the SDGs (SDSN, 2017b).

The integration of the SDGs in university curricula is the great lever for their incorporation in future professionals, being necessary that this integration goes beyond the institutional dimension and advances to practical dimensions (Chaleta et al., 2021; Leal Filho et al., 2019). On the other hand, the perspective of application at a global level allows comparing indicators between the various institutions and knowing how the incorporation of the SDGs has evolved (Chowdhury & Koya, 2017; De La Poza et al., 2021; Freidenfelds et al., 2018; Perović & Kosor, 2020). De La Poza et al. (2021) proposed an assessment of the alignment of the SDGs based on the ranking developed by Times High Education (THE). Annan-Diab and Molinari (2017) consider that professionals from different fields should take every opportunity to implement the sustainable development dimension by considering social, environmental and economic aspects, as well as issues related to decent working conditions and climate change. In their case study on an MBA, they mention the importance of incorporating sustainable development across the curriculum from an integrated and interdisciplinary approach, recognising the added value of different sustainability perspectives. Interdisciplinarity is seen as key to understanding and acting on complex problems, and it is essential to align the expected outcomes of sustainable development education with the SDGs.

Despite progress, there is still a lack of integrative approaches to truly implement the Sustainable Development Goals in higher education. Sáez de Cámara et al. (2021) carry out a case study at the University of the Basque Country (UPV/EHU) proposing a holistic approach involving the whole institution. After defining the analysis path (mapping, integration, diagnosis and definition to estimate the situation taking into

account the SDGs), they concluded that it is crucial that the university defines indicators and values them in order to bring about a culture change in the organisation as a whole (which is traditionally difficult in universities). They conclude that if indicators are not endorsed and valued by the university, they may be seen as an additional administrative burden with the opposite effect. Thus, training university faculty for the development of sustainability through the SDGs is crucial for them to adapt their programmes and methodologies (Saitua-Iribar et al., 2020). It is desirable to achieve sustainable development and, to do so, it is necessary to cross organisational boundaries, align perspectives, ensure global coordination, etc. (Niedlich et al., 2020).

With this commitment, the University of Évora started in April 2020 the mapping of the SDGs in its education offer and was one of the Portuguese Higher Education Institutions to strengthen the alignment with the guidelines outlined in the 2030 Agenda for Sustainable Development. In this context, the University marked for all curricular units SDG4 and challenged teachers to identify other SDGs that could be developed from the curricular units for which they were responsible. This process consisted in marking the SDGs in the university platform (SIIUE-Integrated Information System of the University of Évora) where all the information about the courses is available.

We present, in this case, the data concerning the SDGs of the Social Sciences area and the Arts area considering only the curricular units of the undergraduate courses. We intend to identify differences between Departments of the same scientific area and to identify the main differences between the two scientific areas. In this context, the objectives of the study are: (i) to identify the SDGs marked in the curricular units of the Social Sciences courses; (ii) to identify the SDGs marked in the curricular units of the Arts degree courses and (iii) to identify possible differences in the mapping of SDGs at Departmental level in each area.

After this introduction, this chapter presents the following sections: Method, where the data collection and quantitative data analysis are presented; Results related to SDGs in curricular units by Department and analysis of differences between SDGs in Social Sciences and Arts and finally the Final Considerations are made.

2 Method

2.1 Data Collection

The study aims to map the SDGs marked on the University platform that contains information about all the curricular units. The analysis was carried out taking into account the curricular units of the degree courses indexed to each scientific area/department. The School of Social Sciences includes eight Departments

(Economics, Philosophy, Management, History, Linguistics and Literatures, Pedagogy and Education, Psychology and Sociology) and the School of Fine Arts includes three Departments (Architecture, Visual Arts and Design and Music).

2.2 Quantitative Data Analysis

For quantitative data analysis, descriptive analysis and analysis of variance (ANOVA), we used IBM SPSS Statistics 24.

To compare the SDGs marked in the curricular units we used simple descriptive statistics.

For the hypothesis test, we used analysis of variance (one-way ANOVA) because it allows us to compare the distribution of three or more groups in independent samples. We have proposed the following defined assumptions for the test:

(a) Differences between Departments.

   – H0: There are no differences between the SDGs marked by teachers in each Department.
   – H1: There is at least one Department where the marked SDGs are different.

(b) Differences between the area of Social Sciences and the area of Arts.

   – H0: There are no differences between the SDGs marked by teachers in each area.
   – H1: There are differences between the SDGs marked in the area of Social Sciences and the area of Arts.

3 Results

In the SDG mapping process at the University of Evora, SDG4 (Quality Education) is present in all curricular units (automatically marked by the institution). For this reason, results related to this SDG4 will not be presented. Regarding the marking of the other SDGs, it is the teachers responsible for the curricular unit who mark the SDGs.

It was found that although teachers were asked to mark their course units with the SDGs they considered relevant, about half of the course units have only indicated SDG 4, which was automatically assigned by the institution.

3.1　SDGs in the Social Sciences Curricular Units Per Department

The analysis of the data considering the curricular units of the Social Sciences and Arts degree courses by Department (Tables 1 and 2) shows us, as already mentioned, that SDG4 (ensure inclusive and equitable quality education and promote lifelong learning opportunities for all) was present in all curricular units.

In the Departments of the School of Social Sciences SDG4 corresponds to 39.5% of the objectives indicated and in the Departments of the School of Fine Arts to 68.9%.

Regarding the Departments of the School of Social Sciences (Table 1) we found more SDGs (excluding SDG4) in Linguistics and Literatures, History and Sociology. The most marked SDGs in the Departments were

- SDG5 (achieve gender equality and empower all women and girls) more referred by the Departments of Linguistics and Literatures, History and Psychology.
- SDG10 (reduce inequality within and among countries), more referred by the Departments of Linguistics and Literatures, History and Sociology.
- SDG8 (promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all) more referred by the Departments of Linguistics and Literatures, Sociology and Management.
- SDG16 (promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels) more referred by the Departments of Linguistics and Literatures, History and Sociology.

If we remove the values of SDG4 in relation to the total obtained by each Department, the data does not change in relation to the SDGs most marked in each Department.

We can observe in Table 2 that there are statistically significant differences between Departments in SDG1 (more referred by the Departments of Economics, Sociology and Psychology), in SDG2 (referred by the Departments of Economics and Linguistics and Literatures), in SDG3 (more referred by the Departments of Psychology, Pedagogy and Education and Sociology), in SDG5 (more present in Linguistics and Literatures and History), in SDG8 (more referred by the Departments of Linguistics and Literatures, Sociology and Management), in SDG10 (more in Linguistics and Literatures, Sociology and History), in SDG11 (more in History, Sociology and Linguistics and Literature) and in SDG16 (more in Linguistics and Literature and History).

Table 1 SDGs in the courses by Department of Social Sciences

Departments	SDG																	T	%
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
Economics	5	3	1	46	2	0	1	11	5	6	3	5	1	0	1	5	2	97	9.4
Philosophy	0	0	1	32	2	0	0	0	0	1	1	0	0	0	0	3	0	40	3.9
Management	0	0	2	35	3	0	0	15	4	4	2	5	3	1	1	1	3	79	7.7
History	2	0	2	72	20	0	0	13	0	17	15	1	1	1	1	19	3	167	**16.3**
Linguistics and literatures	0	2	3	78	46	0	0	25	2	39	11	12	5	5	0	34	4	266	**25.9**
Pedagogy and education	3	0	12	43	10	0	0	8	3	13	8	0	1	0	0	6	3	110	**10.7**
Psychology	4	0	17	40	14	0	0	5	3	11	1	0	0	0	0	5	1	101	9.8
Sociology	5	0	9	60	12	0	0	17	6	17	15	3	1	0	0	10	12	167	**16.3**
Total	19	5	47	406	109	0	1	94	23	108	56	26	12	7	3	83	28	1027	100
%	1.9	0.5	4.6	**39.5**	10.6	0	0.1	**9.2**	2.2	**10.5**	5.5	2.5	1.2	0.7	0.3	**8.1**	2.7	100	

Table 2 Analysis of SDG differences in School of Social Sciences

SDG	M	SD	F	p
1. No poverty	1.03	0.182	4.278	**0.000**
2. Zero hunger	1.01	0.077	4.005	**0.000**
3. Good health and well-being	1.08	0.275	12.210	**0.000**
4. Quality education	2.00	0.000	–	–
5. Gender equality	1.16	0.367	28.022	**0.000**
6. Clean water and sanitation	1.00	0.039	0.195	0.992
7. Affordable and clean energy	1.01	0.109	1.070	0.382
8. Decent work and economic growth	1.14	0.343	12.649	**0.000**
9. Industry, innovation and infrastructure	1.06	0.237	2.106	0.033
10. Reducing inequality	1.18	0.382	13.805	**0.000**
11. Sustainable cities and communities	1.11	0.308	2.946	**0.003**
12. Responsible consumption and production	1.06	0.237	2.652	0.007
13. Climate action	1.04	0.207	1.373	0.205
14. Life below water	1.00	0.067	0.916	0.503
15. Life on land	1.01	0.077	0.924	0.496
16. Peace, justice and strong institutions	1.13	0.335	15.383	**0.000**
17. Partnerships for the goals	1.06	0.440	0.743	0.654

3.2 SDGs in the Art Curricular Units Per Department

In relation to Departments of the School of Fine Arts (Table 3), we verify that the Department that scored more SDGs is the Department of Visual Arts and Design (44.6%). However, it should be noted that if we remove SDG4, the Departments that scored more goals are the Department of Visual Arts and Design (n = 63; 53.4%) and the Department of Architecture (n = 49; 41.5%). In the Department of Music only 6 SDGs (5.1%) were marked in addition to SDG4.

The most marked SDGs in the Departments of the School of Fine Arts were

- SDG11 (make cities and human settlements inclusive, safe, resilient and sustainable) more referred by the Department of Architecture.
- SDG12 (ensure sustainable consumption and production patterns), more referred by the Department of Visual Arts and Design.
- SDG13 (take urgent action to combat climate change and its impacts) more referred by the Department of Architecture.
- SDG3 (ensure healthy lives and promote well-being for all at all ages) more referred by the Department of Visual Arts and Design.

In Table 4, we can observe that there are statistically significant differences between Departments in SDG3, SDG5 and SDG8 (more referred by the Departments of Architecture and Visual Arts and Design), in SDG10 (more present in

Table 3 SDGs in the courses by School of Fine Arts

Departments	SDG																	T	%
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
Architecture	0	0	8	51	1	1	3	1	6	1	15	3	10	0	0	0	0	100	26.4
Visual arts and design	2	0	6	106	1	0	1	2	7	4	6	15	7	1	2	5	4	169	**44.6**
Music	0	0	0	104	0	0	0	0	0	6	0	0	0	0	0	0	0	110	29.0
Total	2	0	14	261	2	1	4	3	13	11	21	18	17	1	2	5	4	379	100
%	0.5	0	**3.7**	68.9	0.5	0.3	1.1	0.8	3.4	2.9	**5.5**	**4.7**	**4.5**	0.3	0.5	1.3	1.1	100	

Table 4 Analysis of SDG differences in Department of School of Arts

SDG	M	SD	F	p
1. No poverty	1.03	0.182	3.308	0.020
2. Zero hunger	1.01	0.077	0.853	0.465
3. Good health and well-being	1.08	0.275	6.364	0.000
4. Quality education	–	–	–	–
5. Gender equality	1.16	0.367	27.441	0.000
6. Clean water and sanitation	1.00	0.039	4.165	0.006
7. Affordable and clean energy	1.01	0.109	3.684	0.012
8. Decent work and economic growth	1.14	0.343	20.427	0.000
9. Industry, innovation and infrastructure	1.06	0.237	2.659	0.047
10. Reducing inequality	1.18	0.382	19.146	0.000
11. Sustainable cities and communities	1.11	0.308	9.980	0.000
12. Responsible consumption and production	1.06	0.237	4.104	0.007
13. Climate action	1.04	0.207	9.784	0.000
14. Life below water	1.00	0.067	0.435	0.728
15. Life on land	1.01	0.077	0.426	0.734
16. Peace, justice and strong institutions	1.13	0.335	15.735	0.000
17. Partnerships for the goals	1.06	0.440	1.969	0.117

Visual Arts and Design), in SDG11 and SDG13 (more referred by the Departments of Architecture) and in SDG16 (more in Visual Arts and Design).

3.3 Analysis of the Differences Between the SDGs in School of Social Sciences and School of Fine Arts

The analysis of Table 5 shows differences in most of the SDGs with the exception of SDGs 7, 10 13, 14 and 15.

These SDGs are more often mentioned by the School of Social Sciences, which is expected due to the higher number of Departments and curricular units. No results are presented for SDG4 since they are marked in all curricular units and for SDG6, which was not marked in any curricular unit.

Table 5 Analysis of SDG differences between School of Social Sciences and School of Fine Arts

SDG	Minimum	Maximum	M	SD	F	p
1. No poverty	1	2	1.09	0.280	3.73	0.002
2. Zero hunger	1	2	1.02	0.145	4.73	0.000
3. Good health and well-being	1	2	1.21	0.407	9.95	0.000
4. Quality education	1	2	2.00	0.000	–	–
5. Gender equality	1	2	1.60	0.490	12.0	0.000
6. Clean water and sanitation	1	2	1.00	0.000	–	–
7. Affordable and clean energy	1	2	1.01	0.073	1.97	0.072
8. Decent work and economic growth	1	2	1.48	0.501	3.52	0.003
9. Industry, innovation and infrastructure	1	2	1.12	0.323	3.12	0.006
10. Reducing inequality	1	2	1.57	0.496	2.67	0.016
11. Sustainable cities and communities	1	2	1.29	0.457	4.98	0.000
12. Responsible consumption and production	1	2	1.14	0.347	4.21	0.001
13. Climate action	1	2	1.07	0.255	1.12	0.350
14. Life below water	1	2	1.01	0.103	1,28	0.268
15. Life on land	1	2	1.02	0.126	1.28	0.268
16. Peace, justice and strong institutions	1	2	1.42	0.494	6.46	0.000
17. Partnerships for the goals	1	2	1.14	0.352	2.53	0.022

4   Final Considerations

The results showed that the most marked objectives in the curricular units of the Social Sciences area were, in order of magnitude, SDG5 (achieve gender equality and empower all women and girls), SDG10 (reduce inequality within and among countries), SDG8 (promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all) and SDG16 (promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels). In the area of Arts, the most signalled objectives were completely different, the most relevant being SDG11 (make cities and human settlements inclusive, safe, resilient and sustainable), SDG12 (ensure sustainable consumption and production patterns), SDG13 (take urgent action to combat climate change and its impacts) and SDG3 (ensure healthy lives and promote well-being for all at all ages). These results can be explained by the different nature of the courses and curricular units and the same can be applied regarding the differences between Departments where the respective scientific areas focus on different aspects of sustainable development.

In general, it is safe to guarantee that practically all the SDGs are present in the mapping under analysis in the curricular units of the first cycle courses in these two areas (Social Sciences and Arts) so it can be assumed that, at this early stage of university education, there is a concern to align education with sustainable development values. This shows that the University is trying to respond to the challenges of the 2030 Agenda although there is still a need for greater investment in this area, greater involvement of the various sectors of the institution based on greater coordination and interdisciplinarity. In this way, we can contribute to a university education that challenges its students to adopt more sustainable behaviours in the various domains. The work presented has limits because it only portrays the reality of one part of the institution (two of its five Schools) and because only the undergraduate courses were considered. We also intend to analyse the mapping of the remaining Schools (different scientific areas) and the existing relationship between sustainable development and the Master's and PhD courses in the various scientific areas given the relevance of scientific research and university extension in the framework of sustainable development. In future studies, it will be necessary to broaden the field of analysis to the national framework and whenever possible to the international context.

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