

UNIVERSIDADE ABERTA



UNIVERSIDADE
AbERTA
www.uab.pt

**ASSESSMENT OF SUSTAINABILITY IMPLEMENTATION IN PUBLIC POLICIES AND
STRATEGIES IN PORTUGUESE PUBLIC UNIVERSITIES**

Carla Sofia da Silva e Sá Farinha

Doutoramento em Sustentabilidade Social e Desenvolvimento

2020

UNIVERSIDADE ABERTA



UNIVERSIDADE
AbERTA
www.uab.pt

**ASSESSMENT OF SUSTAINABILITY IMPLEMENTATION IN PUBLIC POLICIES AND
STRATEGIES IN PORTUGUESE PUBLIC UNIVERSITIES**

Carla Sofia da Silva e Sá Farinha

Doutoramento em Sustentabilidade Social e Desenvolvimento

Tese de doutoramento orientada por:

Professora Doutora Sandra Sofia Ferreira da Silva Caeiro

Professor Doutor Ulisses Manuel de Miranda Azeiteiro

2020

Abstract

Worldwide higher education institutions have the responsibility to implement Education for Sustainable Development (ESD) in its multiple ways. The aim of this research is to assess how ESD was integrated into universities in Portugal through their policies and strategies within the framework of the goals of the Decade of Education for Sustainable Development 2005-2014 (UN DESD 2005-2014). Despite some recent studies, this is an underexplored research field in Portugal. This research was mainly based on a qualitative approach and a detailed content analysis method regarding policies, plans and programmes either from the Government or the Ministry of Science, Technology, and Higher Education (MCTES) as well as universities' plans and reports through the decade 2005-2014. Semi structured interviews were conducted to the government bodies and major key actors in the Portuguese universities, i.e., from Portuguese University Council of Rectors (CRUP), as well as, with each sustainability relevant role actor at each university. Results showed that ESD implementation at universities in Portugal is still in its early stages of development and that there is an insufficiency of national integrated strategies or policies. Public Portuguese universities have their own strategies or policies on ESD, leading them to progress with several timely initiatives and practices that resulted from their proactiveness and rhythm rather than from governmental commission. Except for some actions concerning outreach and collaboration, research or education, these initiatives seem to have been taken in isolation from each other and were not holistically integrated, despite some pro-active sustainability implementation actions and best practices. Nevertheless, universities face barriers and challenges in implementing SD that need to be expanded, namely in the promotion of student and staff sustainability awareness, as well as in the development of transdisciplinary courses for students. This study intends to define a country profile of ESD implementation in universities and to show how to move forward through the proposal of the platform Sustainability4U¹ where a think tank of initiatives is put forward. Future investigation will be undertaken as the platform Sustainability4U may be used as a support to widen transfer of knowledge and sharing of (best) practices not only between Portuguese universities, but also at European and international levels based on Portugal's

¹ The registration of the "Sustainability4U" service mark has been filed in the INPI – Instituto Nacional de Propriedade Industrial for usage in Portugal since 12th of March.

case study. Similar regions or profiles may learn from this experience, gaining from the way the barriers were overcome.

Keywords: *Decade of Education for Sustainable Development (DESD) 2005-2014, Higher Education Institutions (HEIs), Portugal, sustainability, universities.*

Resumo alargado

No cumprimento da sua missão a UNESCO teve, desde a sua criação em 1945, como uma das suas preocupações colocar a qualidade da educação na base do desenvolvimento, abordando-a através de uma visão holística como meio para a promoção da paz, da erradicação da pobreza e como impulsionadora do desenvolvimento e do diálogo intercultural.

A educação é um pré-requisito para promover alterações comportamentais e fornecer as competências para o Desenvolvimento Sustentável (DS) na medida em que permite a igualdade de oportunidades entre classes, géneros, e crenças ainda que o conceito de Educação para o Desenvolvimento Sustentável (EDS), que nasceu após a Conferência de Joanesburgo em 2002, deva ser enquadrado a nível local e temporal.

A recomendação da adoção da Década das Nações Unidas da Educação para o Desenvolvimento Sustentável (UN DEEDS) 2005-2014, tem por objetivo integrar, num quadro temporal definido os princípios, os valores e as práticas do DS a todos os aspetos da educação e da aprendizagem.

Uma boa parte destas responsabilidades recai sobre as Instituições de Ensino Superior (IES), que têm assim uma acrescida responsabilidade moral na consciencialização, no alargamento do conhecimento, e no desenvolvimento das competências e dos valores de um futuro sustentável e justo.

O papel que as IES podem desempenhar na educação integrada para a EDS é um dos grandes desafios na transição para um futuro mais sustentável. Para tal, espera-se das IES que, na sequência do caminho que têm vindo a trilhar, continuem a assumir o seu papel central na mudança de paradigma de forma a permitir às gerações atuais e futuras viverem de modo mais saudável e em harmonia e respeito com a Terra, que tem recursos finitos e limites biofísicos que têm sido demonstrados de forma evidente e incontornável. Dados assentarem nos três pilares do “triângulo do conhecimento”: Ensino, Investigação e Inovação, as IES são, neste quadro, absolutamente fundamentais.

Muitas Declarações e Compromissos foram assinados. A assinatura e comprometimento dos líderes das IES, tornando-as verdadeiros catalisadores do DS, são consideradas um sinal promotor da sustentabilidade, como se constata através de diversas Declarações pré-DEDS 2005-2014: Talloires (1990), Halifax (1992), Quioto (1993), Swansea (1993), Copernicus (CO-operation Programme in Europe for Research on Nature and Industry through Coordinated University Studies) (1994), Global Higher Education for Sustainability Partnership (GHESP) (2000), Luneburgo (2001) e Barcelona (2004).

A Declaração de Talloires, de 1990, foi o primeiro ato oficial de compromisso do ensino superior com o DS para que este se assumia como agente de mudança na incorporação e disseminação da sustentabilidade. Em 1994, a Declaração Copernicus, assinada por 196 universidades, foi entendida como o compromisso da gestão de topo das IES com o DS com vista a preservar o ambiente e à promoção do DS.

É importante conhecer-se o perfil e nível de compromisso das universidades em todo o mundo, em particular na Europa, continente onde se encontram as mais antigas instituições, e tendo em conta o seu papel como líder nas estratégias e políticas de implementação da sustentabilidade no ensino superior.

Não existe atualmente em Portugal um estudo sistemático que permita conhecer o perfil das IES, em particular das universidades públicas, e identificar pistas e boas práticas para a sua melhor implementação. Este facto leva a questionar de que forma e em que termos foi integrada a sustentabilidade nas estratégias institucionais no ensino superior universitário em Portugal, nomeadamente nos planos, programas e políticas do Governo e do Ministério da Ciência, Tecnologia e Ensino Superior (MCTES) e nas estratégias e práticas das Instituições de Ensino Superior Universitário Público (IESUP) como balanço da DESD 2005-2014.

O objetivo geral deste trabalho foi avaliar de que forma a sustentabilidade foi integrada nas Instituições de Ensino Superior Universitário (IESU) público em Portugal, através das suas estratégias institucionais, no âmbito dos objetivos da UN DEDS 2005-2014. Os objetivos específicos, que estão organizados por ordem cronológica e de forma a responder ao objetivo geral, foram:

- (i) Avaliar a integração da sustentabilidade nos planos, programas e políticas do Governo português e do MCTES;
- (ii) Avaliar a integração da sustentabilidade nas estratégias e políticas das catorze IESUP na perspetiva de alguns dos atores chave com impacto no processo de decisão;
- (iii) Analisar as ações e as (boas) práticas nas IESUP onde tenha sido identificada a aplicação de estratégias, políticas para a sustentabilidade com vista a avaliar e definir um perfil do país; e
- (iv) Propor um modelo de inclusão de melhorias de sustentabilidade (think tank de iniciativas) nas estratégias e políticas das IESUP, com vista a aumentar, transferir o conhecimento e partilhar as (melhores) práticas integradas entre as Instituições de ensino superior portuguesas.

Esta investigação segue um desenho de investigação baseado no estudo sobre as catorze universidades públicas em Portugal, de acordo com uma abordagem maioritariamente dedutiva (onde se recorreu em parte à Grounded-Theory), com métodos mistos, embora maioritariamente qualitativos, utilizando análise de documentação (dados secundários) e entrevistas semiestruturadas (dados primários).

Como primeiro passo, foi realizada uma revisão da literatura e reflexão crítica sobre diversos documentos de origem governamental e do Ministério (MCTES) recolhidos e organizados cronologicamente. Para a análise de conteúdo foi utilizada o software NVivo, cujo objetivo foi avaliar se nos programas e políticas do Governo em geral e, especificamente, do MCTES, a sustentabilidade foi integrada nas universidades públicas, e em caso afirmativo, de que forma, em particular durante a DEDS 2005-2014.

Seguidamente, realizou-se um estudo exploratório de acordo com uma abordagem qualitativa através de entrevistas semiestruturadas com atores chave com impacto no processo de decisão de implementação da sustentabilidade nas universidades públicas portuguesas. Esta fase visou obter mais informação sobre planos, políticas e programas não acessíveis ou não tornados públicos, que de outra forma estariam fora do nosso alcance, bem como obter indicações relativamente às barreiras sobre a implementação da EDS nas universidades públicas.

Na terceira fase procedeu-se à análise, ao nível de cada uma das instituições, do conteúdo de planos estratégicos, planos e relatórios de atividades e relatórios de sustentabilidade (PEs, PAs, RAs e RSs, respetivamente) das catorze IES, o que foi essencial na avaliação de uma primeira definição do perfil do País no que respeita à implementação da sustentabilidade no sector da educação superior.

Por último, foram realizadas entrevistas semiestruturadas (ainda que na primeira parte do guião a entrevista indicasse uma entrevista estruturada) aos atores com papel relevante na integração da sustentabilidade em cada uma das universidades. O objetivo foi o de listar as diferentes ações implementadas, bem como de que forma se ultrapassaram as barreiras, quer durante a UN DEEDS 2005-2014 quer na atualidade (2018), e ainda conhecer os desafios que se anteveem para as universidades. Foram, igualmente, discutidas iniciativas e boas práticas por parte de quase todas as IES.

Verificou-se assim que, ao longo da DEEDS 2005-2014, houve alguma insuficiência quer de orientações estratégicas quer de políticas nacionais respeitantes à implementação da EDS no ensino superior emanadas quer do Governo quer do Ministério da Ciência, Tecnologia e Ensino Superior. Estes resultados decorrem quer da análise de documentos quer das entrevistas a atores chave.

Ainda que o Programa Massachusetts Institute of Technology (MIT) Portugal tenha sido um bom exemplo de compromisso político e estratégico de aplicação de sustentabilidade no ensino superior, com a criação de Mestrados (MSc) e Doutoramentos (PhD), este focou-se maioritariamente na área da energia. O mesmo se pode dizer do programa de Eficiência Energética na Administração Pública (Eco.AP), um outro bom exemplo do envolvimento Ministerial, cujo papel é o de avaliar e implementar medidas para melhorar e reduzir o consumo energético nas universidades.

Os resultados obtidos sugerem que a UN DEEDS 2005-2014 não foi considerada em si mesma uma motivação para a incorporação da sustentabilidade nas universidades, tal como a assinatura de declarações formais não foram nem condição necessária nem suficiente para tal. Foram as Universidades, por sua iniciativa, que protagonizaram o seu próprio

movimento de implementação, tendo sido possível recolher no seu conjunto bons exemplos e iniciativas.

Da análise de documentação das universidades públicas portuguesas no período da DEDS 2005-2014, constata-se que estas integraram a sustentabilidade nas suas políticas e estratégias principalmente através das dimensões “operações no campus”, “alcance e colaboração” e “DS através de experiências no campus”, através de múltiplas e diferentes ações, algumas delas não circunscritas a uma única universidade.

Quando, para efeitos desta investigação, se procedeu à realização de entrevistas aos atores com papel relevante na temática da sustentabilidade nas universidades públicas e se questionou quer o período da década quer o ano de 2018, as dimensões que surgem como relevantes na integração da sustentabilidade, e sem alteração entre momentos, são: (i) “operações no campus”, (ii) “educação”, (iii) “alcance e colaboração”, (iv) “investigação” e, só depois, (v) “DS através de experiências no campus”.

As ações das universidades relacionadas com a EDS mostram que as ações relacionadas com EDS foram realizadas de forma “isolada” e não de forma integrada de acordo com a “whole institution approach” da Organização das Nações Unidas. Realce-se a exceção de parcerias no DS, nos projetos de investigação, publicações, colaboração em projetos de desenvolvimento sustentado (DS) e financiamento para a investigação.

Foi, ainda, possível conhecer as (melhores) práticas nas universidades públicas onde, apesar de existirem áreas chave onde as IES, não obstante barreiras como a falta de recursos financeiros e humanos e da falta de enquadramento de políticas governamentais, enfrentaram os desafios no âmbito da sustentabilidade.

Através deste estudo foi possível chegar a uma definição de perfil do País para a implementação da sustentabilidade no sector da educação superior, em particular nas universidades públicas, sendo proposta uma plataforma de diálogo e partilha - Sustainability4U - com vista a potenciar a aprendizagem do tema no seio da comunidade das IES.

Esta plataforma Sustainability4U é uma proposta de iniciativas para ampliar e transferir o conhecimento, bem como para partilhar as (melhores) práticas integradas entre as IES portuguesas, sejam elas universidades ou politécnicos.

Os desafios à implementação do DS estão relacionados com iniciativas: (i) ao nível governamental e institucional, como sejam um maior financiamento e uma maior regulamentação governamental, mas também com (ii) iniciativas ao nível das próprias IES.

São necessárias estratégias para a implementação do DS nos planos institucionais, na criação de um gabinete dedicado à EDS nas universidades ou nas faculdades onde tal estrutura não exista e na criação de competências transversais em DS acessíveis a todos os estudantes, através de disciplinas e/ou cursos para promover a transdisciplinaridade. O propósito é que o DS seja parte integrante da cultura da universidade e crie um fator multiplicador na instituição e na sociedade não só a longo prazo, como também no futuro próximo.

Em 2018 foi criada a “Rede Campus Sustentável” entre os membros da comunidade das IES (universidades e politécnicos) com vista à partilha de conhecimento e experiências, mas igualmente para levar a gestão de topo a assinar uma carta de compromisso baseada na Declaração de Copernicus e na Estratégia Nacional para a Educação Ambiental (ENEA). Esta Iniciativa mostra não só um compromisso da comunidade académica portuguesa como um bom exemplo de uma abordagem “bottom-up”. O compromisso para a implementação de políticas públicas nas universidades é crítico para que o processo seja efetivo no que respeita à EDS inclusivo. Consequentemente, há uma necessidade premente de alterar o paradigma nas universidades portuguesas e ainda debelar alguns obstáculos.

* * *

Este estudo apresenta algumas limitações, nomeadamente o escasso número e qualidade de documentos originários de fontes Governamentais e Ministeriais ou mesmo da Sociedade Civil (capítulo 1) aplicáveis à temática (DESD 2005-2014). Poder-se-á considerar que este facto denota uma falta de compromisso por parte das instituições governamentais face à EDS. No entanto, nada se pode referir com acuidade sobre a representatividade da amostra dado que, apesar dos elevados esforços desenvolvidos, e ainda que não tenham

recolhido mais documentos, eles poderiam existir e não estar disponíveis e/ou alcance dos investigadores.

No que concerne às perceções dos atores chave (capítulo 2) face à implementação da EDS o estudo poderia ter sido enriquecido com a opinião do Ministro da Ciência, Tecnologia e Ensino Superior, Secretários de Estado e de pelo menos mais um responsável do Conselho de Reitores das Universidades Portuguesas (CRUP), nomeadamente o líder de 2010 a 2014. No entanto, tal não foi possível em tempo útil, apesar dos melhores esforços. A amostra por ser de conveniência não permite que os resultados sejam generalizados para o sistema de ensino superior português, não só devido ao escasso número de entrevistados (sete de uma amostra de quinze), mas também devido à sua natureza (provenientes do governo, academia e sociedade civil). No entanto, o objetivo das entrevistas com atores chave serviu para confirmar a análise prévia de documentos oficiais e cada entrevista foi muito completa, permitindo aproximação à saturação de informação, o que significa que informação adicional recolhida forneceria eventualmente poucos dados novos.

Para o período em causa (2005-2014), as principais universidades publicaram toda a documentação necessária para tratamento e análise (capítulo 3). Ainda assim, teria sido importante aceder a um maior número de documentos publicados ou disponíveis, relativamente a algumas universidades. Para tal, foram envidados esforços para obter informação adicional quer através dos websites, quer por contacto direto com os técnicos e/ou centros de documentação.

O método por convite direto da entrevista forneceu boas respostas (capítulo 4), mas (em alguns casos) pode não ter sido entrevistada a pessoa ideal no sentido de ser aquela com o maior conhecimento dos esforços de implementação da sustentabilidade e/ou de atividades na sua instituição. O guião de entrevista foi desenvolvido para ser compreendido por todos os respondentes e cobrir um largo espectro de temas. No entanto, pode ser difícil para um entrevistado ter um conhecimento adequado e suficiente de todos os tópicos e temas em causa.

Pretende-se em desenvolvimentos futuros pôr em prática a plataforma Sustainability4U, não só entre as IES portuguesas, mas igualmente a nível europeu e internacional, baseado no estudo de caso de país do sul da Europa, Portugal. Regiões ou perfis semelhantes podem aprender com esta experiência, ganhando experiência com a forma como os obstáculos foram ultrapassados. O conhecimento do perfil detalhado das Universidades pode ser ainda alargado a todas as IES em Portugal.

Palavras-chave: *Década para o Desenvolvimento Sustentável (DESD) 2005-2014, Instituições de Ensino Superior, Portugal, sustentabilidade, universidades.*

To António and Matilde

Acknowledgements

"Education is the most powerful weapon which you can use to change the world".

(Mandela, 2013)

"Without significant precautions, education can equip people merely to be more effective vandals of the Earth".

(Orr, 1994)

I have dedicated almost 4 years of my time to the development of this thesis in the same circumstances I have devoted to my Master's thesis 20 years ago. I have been working at same time as I was developing research and writing this document. I must confess that I had times and believe most of PhD students feel the same at some stage of this journey, to give and throw it all away. Nevertheless, the passion for the thematic and the people we are lucky to have find makes us believe that this is a worthwhile and challenging project, despite some frustrations along the way.

But this is part of the job. For my decision to get along with this research I am deeply grateful to my two supervisors, Prof. Dr. Sandra Caeiro and Prof. Dr. Ulisses Azeiteiro, who provided me not only guidance in the investigation whenever I needed it but also the timely and precise words to keep on going with this project.

"What's going on? A PhD student must suffer; it's part of the journey. No pain, no gain", once someone told me.

They have always been available to give prompt feedback and optimism to find and proceed my own research line, giving space for my own ideas and progress. Each of them contributed to the research development, and together, they complemented each other in perfection. We are all different, but this is what TEAM work means, together everyone e

achieves more. Both supervisors were very kind on supporting and giving their sympathy for the bad moments the PhD students have when writing a thesis. A warm call or an email in these circumstances makes all the difference.

- I would like to thank you, Prof. Dr. Sandra Caeiro, in particular, for presenting me to new challenges and academic tasks that allowed me to learn and to develop new skills beyond the PhD research. Thank you as well for your close guidance and detailed feedback on every manuscript I wrote. You enriched them with your comments and suggestions. You also supported me when I was overwhelmed, especially in the earlier stages. All human qualities were showed were I most needed them: many thanks.

- I would like to thank you, Prof. Dr. Ulisses Azeiteiro, especially for your great inspiration, you helped me to maintain the confidence I needed it the most either professionally or personally. A special thanks for your prompt calls and emails calling attention for details that make all the difference.

- Thank you both for your availability to help me out and for your very important presence during the Stiges 2015 Journal Cleaner Production Conference, Lisbon ISDRS 2016 Conference, Bogotá ISDRS 2017 Conference, MIT São Paulo 20017 Conference and all eSustainability seminars at UAb. Last but not the least, thank you for putting me in contact with facilitators with access to the interviewees. You are great professionals with whom I am lucky to have work with.

- I am grateful to Prof Gomes Martins for his cooperation particularly in the field work stage of this thesis.

- I wish to thank the Center for Environmental and Sustainability Research (CENSE) and to the its researchers for their sharing and network.

- I thank Elisabete Soares, Marta Aleixo, Inês Cosme, Antje Disterheft, Giulia Sonetti and all my PhD colleagues for their continuous support and encouragement.

- I thank Madalena Carvalho of Universidade Aberta for her support in my research and particularly for liaising with other documentation services.

- Thank you to the all anonymous reviewers and Professor Walter Leal Filho for his comments on the paper presented in Part IV.

- I am also indebted to all the interviewees, who must remain unnamed but without whom this investigation would not have been possible.

* * *

I am grateful to my family whom I love.

Especially to my children, António and Matilde, who missed me many times when I was deeply involved in the research and I could not give them that special attention they needed and expected. Only with their love and understanding, it was possible to accomplish this goal.

To my mother, my "right hand", for her very important role which she knows only too well: THANK YOU!

My gratitude and love go also to Pedro, for everything, but mostly for being there where I most needed him.

TABLE OF CONTENTS

GENERAL INTRODUCTION	1
CHAPTER 1: Education: Sustainable Development incorporation into Portuguese Higher Education Institutions	19
1 Introduction	22
2 Theoretical Framework	23
3 Methods	27
3.1 Sample, data collection, analysis and treatment	27
4 Results and Findings	30
4.1 Governmental planning and Education for Sustainable Development	30
4.2 Ministry of Education and Science policies and the (un)leverage effect on HE	33
5 Discussion	37
6 Conclusions	38
CHAPTER 2: Conceptualization of sustainable higher education institutions, roles, barriers, and challenges for sustainability: An exploratory study in Portugal	43
1. Introduction	44
2. Literature review	46
2.1 Institutional background	46
2.2 European universities: ESD implementation	47
3. Methods	51
3.1 Nature of the study and interview questions	51
3.2 Sample	51
3.3 Data collection	54
3.4 Data treatment	55
4. Results, findings and discussion	55
4.1 Global approach	55
4.2 The Government's and Ministry's role	57
4.3 Ministry of Science, Technology and Higher Education's role (MCTES)	61
4.4 Portuguese University Rectors Council (CRUP)	62
4.5 The public universities role	63
4.6 Documents and/or important/relevant information in the sustainability implementation process through Governmental and ministerial plans, programmes or policies	65

4.7	Impacts of DESD 2005-2014 on Portuguese society	69
5.	Discussion.....	69
6.	Conclusions	73
CHAPTER 3: UN Decade of Education for Sustainable Development: Perceptions of Higher Education Institution’s Stakeholders		77
1.	Introduction	80
2.	Material and methods.....	85
2.1	Sample of universities	85
2.2	Data collection and time frame.....	87
2.3	Documental approach of public Universities sustainability integration	88
2.4	Documental sample data treatment and analysis	89
3.	Results	92
3.1	The sustainability implementation actions in public Portuguese HEIs	92
3.2	The DCI and the commitments of the Portuguese public HEI.....	96
3.3	The commitments of HEIs with Sustainability Reports (RS) and DCI.....	96
3.4	The Universities’ commitments to SD without signing any DCI or RS.....	99
4.	Discussion.....	102
5.	Conclusions, Future Lines of Research and Limitations of the Study.....	106
CHAPTER 4: The Implementation of Sustainability Practices in Portuguese Higher Education Institutions		121
1.	Introduction	122
2.	Methods	126
2.1	Nature of the study	126
2.2	Development of the interview script	127
2.3	Target group.....	130
2.4	Data Collection	131
2.5	Data treatment and analysis	132
3.	Results and findings	133
3.1	Recognized University System	133
3.2	Barriers to implementing SD according to extreme balance answers	147
3.3	Challenges for SD implementation that influence strategies in Portuguese universities 149	
4.	Discussion.....	154

4.1 - Discussion of findings.....	154
4.2 - Sustainability4U platform	158
4.3 – Limitations of the present study	162
5. Conclusions	163
FINAL REFLECTIONS AND CONCLUSIONS	167
POSTFACE.....	175
REFERENCES	177
APPENDICES	199

List of Tables

Table 1 Selected key words after a content analysis of systematic review	29
Table 2 Characteristics of ESD implementation, performance and evaluation in HEI in some European countries	48
Table 3 Sample: initial and final	53
Table 4 Interview process (date, mode, duration and number of requests) of the final sample	54
Table 5 Number of affirmative answers (“yes”) to each of the research questions	57
Table 6 Characteristics of Portuguese Public Universities	86
Table 7 Document type by Portuguese public University	88
Table 8 Four-step approach in data treatment and analysis	90
Table 9 The highest frequency of Keywords.	91
Table 10 Number of Sustainability implementation actions by dimension and University.	93
Table 11 Sustainability reports: UP and UMinho	98
Table 12 Interview characteristics (first contact, date, mode, length and number of requests)	130
Table 13 Interviewees’ opinions concerning “explicitly written” positive answers and “explicitly mentioned as environmental or social issues” positive answers	136

List of Figures

Figure 1 Number of key words (words or text) references through the Portuguese Governmental Programmes (from 2005 to 2015)	31
Figure 2 Number of key words (words or text) references through the Portuguese Governmental Programmes (from 2005 to 2015)	32
Figure 3 Number of key words (words or text) references in the Great Planning Options (GPO) (*) from 2005 to 2014 in Portugal (**)	33
Figure 4 The top 20 of words references in the national documents related to ESD and DESD 2005-2014 in Portugal.....	34
Figure 5 The nodes percentual distribution for the most frequent words (top 20 ranking)	35
Figure 6 Number of codified keywords references and document coverage	36
Figure 7 Affirmative results of the interviewees on the research questions “Yes or No” ..	56
Figure 8 Key actors’ distribution of frequencies about Portuguese University Rectors Council (PURC) development of strategies to implement sustainability in their plans, programmes or policies’ through DESD 2005-2014	63
Figure 9 TOP 10 Forms of sustainability implementation in public Universities regarding the number of codified references (no mutually exclusive) according to key actors ‘opinion ..	65
Figure 10 Number of codified references in the documents organized by their name and type as well as by key actor classification (obtained from the answers to questions 1b and 3b)	68
Figure 11 Distribution of document type through the UN Decade 2005–2014 in Portuguese public universities	89
Figure 12 Number of Sustainability implementation actions by each dimension	94
Figure 13 Number of Sustainability implementation actions in each public University in each dimension	94
Figure 14 Think tank of initiatives in Portuguese public Universities	95
Figure 15 Box-plot: TOP 3 sustainability implementation actions in public Portuguese universities	101
Figure 16 Interviewees answers about the institutional framework during UN Decade 2005-2014	135
Figure 17 Interviewees answers about the institutional framework in 2018	136
Figure 18 Interviewees opinions about implementation of SD in campus operations during the UN Decade 2005-2014 vis à vis 2018.....	138
Figure 19 Interviewees’ opinions about the implementation of sustainable development in education during the UN Decade 2005-2014.....	139
Figure 20 Interviewees’ opinions about the implementation of sustainable development in education in 2018	140

Figure 21 Interviewees’ opinions about the implementation of sustainable development in research during UN Decade 2005-2014	141
Figure 22 Interviewees’ opinions about the implementation of sustainable development in research in 2018.....	141
Figure 23 Interviewees’ opinions about the implementation of sustainable development in outreach and collaboration during UN Decade 2005-2014	142
Figure 24 Interviewees’ opinions about the implementation of sustainable development in outreach and collaboration in 2018.....	143
Figure 25 Interviewees’ opinions about the implementation of sustainable development through on-campus experiences during UN Decade 2005-2014	144
Figure 26 Interviewees’ opinions about the implementation of sustainable development through on- campus experiences in 2018.....	144
Figure 27 Interviewees’ opinions about the implementation of sustainable development through on- campus experiences during UN Decade 2005-2014	145
Figure 28 Interviewees’ opinions about the implementation of sustainable development through on- campus experiences in 2018.....	146
Figure 29 Aggregated interviewees’ opinions about the implementation of sustainable development in assessment and reporting during	146
Figure 30 Aggregated interviewees’ opinions about the implementation of sustainable development in assessment and reporting in 2018.....	146
Figure 31 Aggregated interviewees’ answers for the campus operations, education, research, outreach, on-campus experiences, and assessment and reporting during UN DESD 2005-2014.....	146
Figure 32 Aggregated interviewees’ answers for the campus operations, education, research, outreach, on-campus experiences, and assessment and reporting in 2018	147
Figure 33 Barriers to the SD implementation that influenced strategies in Portuguese public universities during UN DESD 2005-2014	148
Figure 34 Challenges to the SD implementation in Portuguese public universities.....	150
Figure 35 Mapping challenges towards implementation sustainability in Portuguese universities in short and long run	153
Figure 36 Universities and Global and National Programmes	154
Figure 37 Sustainability4U platform	160

List of Appendices

APPENDIX A Letters of invitation requesting interviews (Chapters 2 and 4)	195
APPENDIX B Interview scripts (Chapter 2 and 4)	199
APPENDIX C Journal Article Appendix (Chapter 3)	213
APPENDIX D Presentations at Conferences, Seminars, Symposiums	217

List of abbreviations and acronyms

A3ES - Agency for Assessment and Accreditation of Higher Education;

ADENE - National Agency for Energy;

APA - Portuguese Environment Agency;

AULSF - Association of University Leaders for a Sustainable Future;

CEE - European Economic Community;

CENSE - Centre for Environmental and Sustainability Research (of UNL);

CESAM - Centre for Environmental and Marine Studies (of UA);

CGP - Constitutional Government Programmes;

CNADS - National Council for Environmental and Sustainable Development;

CNE – Conselho Nacional de Educação;

Columbus Consortium - Columbus Knowledge transfer for blue growth;

COPERNICUS - Co-operation Program in Europe for Research on Nature and Industry through Coordinated University Studies;

COPERNICUS CHARTER or DECLARATION - Same as CUPERNICUS;

CRE - Conference of European Rectors;

CRUE - Rectors Conference of the Spanish Universities;

CRUP - Portuguese University Rectors Council;

DCIs - Declarations, Charters and Initiatives;

DESD - Decade of Education for Sustainable Education (same as UN Decade 2005-2014);

DGES - Higher Education General Direction;

DGS - National Health Directorate General;

DS - Desenvolvimento Sustentável (same as SD);

EAUC - Environmental Association of Universities and Colleges;

EBA - Extreme Balance Answers;

Eco.AP - Energetic Efficiency Program in the Public Administration;

EDS – Educação para o Desenvolvimento Sustentável (same as ESD);

EFA - "Education for All" movement;

EfS - Energy for Sustainability;

EMS - Environmental Management System;

ENDS - National Strategy for Sustainable Development;

ENEA - National Strategy for Environmental Education;

ESD - Education for Sustainable Development;

EUA - European Universities Association;

FCSH - Social Sciences and Humanities Faculty (of UNL);

FCT - Foundation for Science and Technology;

FCT(UNL) - Faculty of Sciences and Technology (of UNL);

FEUP - Engineering Faculty of University of UP;

FTE - Full Time Equivalent;

GAP - UNESCO Global Action Plan on ESD;

GAS - Porto - Oporto Social Action Group;

GHGs - Greenhouse gases;

GMDI – Graz Model for Integrative Development;

GPO - Great Planning Options;

GRI - Global Initiative Report;

GUNi – Global University Network for Innovation;

HE - Higher Education;

HEI(s) - Higher Education Institution(s);

HES - Higher Education Sustainability;

HESI - Higher Education Sustainable Initiatives;

IES - Instituições de Ensino Superior (same as HEI);

IESU - Instituições de Ensino Superior Universitário (same as UHEI);

IESUP - Instituições de Ensino Superior Universitário Público (same as Public UHEI);

IHME - Institute for Health Metrics and Evaluation;

INE - Statistics Portugal;

IPAD – Instituto Português de Apoio ao Desenvolvimento

ISCTE-IUL - University Institute of Lisbon;

MCTES - Ministry of Science, Technology and Higher Education;

MDG - Millennium Development Goals;

MIT - Massachusetts Institute of Technology;

MSc - Master of Science;

Nagoya Declaration - UNESCO Aichi-Nagoya Declaration on Education for Sustainable Development;

NP (EN) ISO - Portuguese standard (in English) according to International Standards Organisation;

NUTS II - Nomenclature of Territorial Units for Statistical Purposes;

NVivo - Qualitative data analysis software package produced by QSR International;

OECD - Organisation for Economic Co-operation and Development;

ONU - Organização das Nações Unidas (same as UN);

PA - Activity and operational plans;

PDE - Strategic plans and development plans;

PE - Strategic activity plans;

PhD - Doctor of Philosophy;

PIDS – Portuguese Institute for Development Support (same as IPAD);

PIENDS - ENDS Implementation Plan (see ENDS);

PNEE - National Action Plan for Energy Efficiency;

PNER - National Action Plan for Renewable Energy;

PURC - same as CRUP;

QUAR - Responsibility and Assessment Framework (“Quadro de avaliação e responsabilização”);

R&D - Research & Development;

RA - Activity reports;

RC - Annual financial reports;

RS - Sustainability reports;

RCE - United Nations Regional Center of Expertise;

RISU - Red de Indicadores de Sostenibilidad en las Universidades;

RJIES – Regulamento Jurídico das Instituições de Ensino Superior (same as “Legal framework of Higher Education Institutions”);

SAQ - Sustainability Assessment Questionnaire;

SD - Sustainable Development;

SDG - Sustainable Development Goals;

SGT - Total Management System;

SGTC - Centralized Technical Management System;

SHEI - Sustainable Higher Education Institutions;

SIA - Sustainability Implementation Actions;

SME - Small Medium Enterprises;

SPSS - Statistical Package for the Social Sciences, software package produced by IBM Corporation;

STARS – Sustainability, Tracking, Assessment & Rating System;

THE – Times Higher Education;

UA - University of Aveiro (Universidade de Aveiro);

UAb - Universidade Aberta;

UAc - University of the Azores (Universidade dos Açores);

UAlg - University of Algarve (Universidade do Algarve);

UAM - Universidade Autônoma de Madrid;

UBI - University of Beira Interior (Universidade da Beira Interior);

UC - University of Coimbra (Universidade de Coimbra);

UCP - Portuguese Catholic University (Universidade Católica Portuguesa);

UÉ - University of Évora (Universidade de Évora);

UHEI - University Higher Education Institutions;

UL - former University of Lisbon (merged with UTL into ULisboa);

ULisboa - University of Lisbon (Universidade de Lisboa);

UMa - University of Madeira (Universidade da Madeira);

UMinho - University of Minho (Universidade do Minho);

UN - United Nations;

UN Decade 2005-2014 - United Nations Decade of Education for Sustainable Education 2005-2014 (same as UN DESD);

UN SDG - United Nations Sustainable Development Goals;

UNCED - United Nations Conference on Environment and Development;

UNLD - United Nations Literacy Decade;

UNEP - United Nations Environment Programme;

UNESCO - United Nations Educational, Scientific and Cultural Organization;

UNL - New University of Lisbon (Universidade Nova de Lisboa);

UP - University of Porto (Universidade do Porto);

USFL - University Leaders for Future Leaders;

UTAD - University of Trás os Montes (Universidade de Trás os Montes e Alto Douro);

UTL - Technical University of Lisbon (merged with UL into ULisboa).

GENERAL INTRODUCTION

“(...) it is almost impossible to identify the exact origin of education for sustainable development (ESD). Each of us in the field has a story of our initial reaction when and where we first became aware of it.”

(Hopkins, 2012).

“Without sustainability policies, it is very difficult to encourage or motivate members of universities to participate in sustainability initiatives or HESD”.

(Lee, K. et. al., 2013)

1. Overview

1.1 Identification of the problem and relevance of the research

This general introduction aims to introduce the overall research topic and the organization of the doctoral thesis. The introduction is divided into four subsections: First, the identification of the research problem, justifying its relevance and impact on the study. Next, the research questions, and objectives (general and specific) are pointed out, followed by the brief context of theoretical background. In the fourth section, an explanation of the methodological approach and the chosen research design, and in the fifth section, the structure of the thesis is presented and finalized with some general remarks.

The United Nations Decade of Education for Sustainable Development (2005-2014) sought to mobilize the World's educational resources to create a more sustainable future. Many paths to sustainability (e.g. sustainable agriculture and forestry, research and technology transfer, finance, sustainable production and consumption) exist and are mentioned in Agenda 21, the official document of the 1992 Earth Summit. Education is one of these paths and alone cannot achieve a more sustainable future. Nevertheless, without education and learning for sustainable development, this goal will not be reached.

The overall goal of the UN DESD, whose lead agency is UNESCO, was to integrate the principles, values and practices of sustainable development into all aspects of education and learning. This effort encouraged changes in behavior that created a more sustainable

future in terms of environmental integrity, economic viability and a just society for present and future generations.

As DESD had the potential to impact the way people think, it was important to monitor progress and capture learning in the process of implementation. Given the wide scope of ESD, both quantitative as well as qualitative data were important in monitoring and evaluating the Decade (UNESCO, 2005).

Lozano et al. (2015) within UN DESD 2005-2014 period analyzed declarations, charters and initiatives (DCI) for HEIs, which could be considered representative of university leaders' intentions to help improve the effectiveness of ESD and a promotional sustainable "signal" (Karatzoglou, 2013). By the end of 2014, Lozano et al. (2015) mentioned as the result of an international survey to HEIs worldwide, namely in Europe, that they have become involved in embedding sustainable development into their academic systems.

Lozano et al. (2013, 2013a) proposed that for universities to become sustainability leaders and change drivers, they must ensure that the needs of present and future generations are better understood. For that, the professionals who were well versed in SD could effectively educate students of "all ages" and help make the transition to "sustainable societal patterns".

The milestones for DESD were listed in the implementation scheme as well as the strategies for integrating ESD as there was "(...) a commitment that will be implemented by Member States according to their priorities and approaches" (UNESCO, 2005: 16).

The Talloires Declaration was determinant in the definition of sustainability in terms of HEI as it had been signed in 1990 (Clugston & Calder, 1999). Considering commitment to sustainable development (SD) by top management in higher education, Copernicus Charter, which was signed by many universities, mentions that: "Universities' and equivalent HEI's duty is to propagate environmental literacy and to promote the practice of environmental ethics in society" (CRE, 1994: 1).

The studies and discussion about the integration of sustainability through policies and strategies within the framework and goals of DESD 2005-2014 in Portugal according to

Aleixo et al. (2016; 2017a) are predominantly at an early stage of SD and this seems to be incremental, meaning that SD is still has not yet entered HEIs' system and activities.

Shiel et al. (2016) stated that Portugal has lagged other European countries, namely in externally oriented activities aimed at building capacity within local communities to promote SD in the dimension of "outreach". Despite having signed Declarations, Initiatives and/or Charters, Portuguese public HEIs may or may not have implemented SD, while others that did not sign any commitment have engaged in implementing sustainability.

Agenda 21 was the official document of the 1992 Earth Summit on Sustainable Development that led to DESD 2005-2014. Considering 2014 as UNESCO program last year, this is an opportunity to verify if the above-mentioned principles have been applied in the Portuguese context by the implementation of policies and/or strategies of the multiple HEI.

Moreover, in 2014 the Global Action Program (GAP) was agreed when UNESCO World Conference on ESD was held in Aichi-Nagoya (Japan) as the United Nations was discussing the implementation of Sustainable Development Goals (SDG) whose 2030 Agenda for Sustainable Development was adopted in September 2015. Concerning SDG and HEIs, Salvia et al. (2019) points out a contribution to current state of knowledge by outlining some actions universities may take, to move forward with SDGs implementation in HEIs.

Regardless of previous research, it is important to comprehend how Portuguese public HEIs are applying ESD at policy and strategy levels (between 2005 and 2014) since no attempt has been made to evaluate their commitments and practices in a systematic and detailed way.

The study aims Public universities, which are geographically spread, due to its important role to further strengthen and scale up ESD, namely in transforming societies and in key aspects of citizenship (UNESCO, 2014). If considering all public HEIs, universities and polytechnics (more than forty HEIs), it would not be reasonable to detail as necessary the study.

This research aims to discuss the integration of ESD in the fourteen public Portuguese universities through policies, plans and strategies within the framework and goals of DESD 2005-2014 and define and share good practices that can put forward the ESD

implementation in universities in Portugal. It intends to contribute to the definition of a profile of ESD implementation in HE sectors based on a European country example (the Portuguese) and showing how to move forward through the proposal of a Sustainability4U platform.

1.2 Research questions and objectives

The general aim is to “assess how sustainability was integrated in Portuguese public universities through their institutional strategies”. This research is based on two main research questions:

- a. How the sustainability was integrated in public Portuguese universities, within the aims of DESD 2005-2014? and,
- b. How can they move forward so implementation can really be achieved?

To answer these questions, four specific objectives were chronologically organized:

- (i) Assess the extent (if and how) to which the Portuguese Government and the Ministry integrated sustainability in their plans, programmes and policies;
- (ii) Assess how public Portuguese universities implemented sustainability in their plans, programmes and policies according to some key actors’ perspectives with decision making impact;
- (iii) Analyze the extent to which ESD has been integrated in universities through their strategic plans, sustainability reports and activity plans and reports;
- (iv) Analyze the different self-reported ESD practices of the last 15 years and propose a think tank of initiatives to be applied by Portuguese HEIs.

1.3 Theoretical background

1.3.1. HEIs as change agents, DESD’s role and other initiatives

Over the last decade many research tried to evaluate how Sustainable Development has been applied and implemented in Higher Education Institutions (HEI) (Lozano et al., 2015)

as HE for SD plays a crucial role in the transformation of society towards a more sustainable pathway of development (Brudermann et al., 2019; Anand et al., 2015).

Higher Education leaders have to be committed to sustainability by integrating it into policies and strategies; showing the commitment by signing a declaration, charter, or initiative; establishing short, medium and long-term plans for its institutionalization; and ensure that sustainable development is implemented throughout the HE system (Lozano et al., 2015). Moreover, Ramísio et al. (2019) assert that HEIs have the obligation to lead the movement, combining all dimensions of SD, and the responsibility to act, whatever their location.

Within the all educational system and according to (UNESCO, 2005) the DESD (2005-2014) aim was to integrate the principles, values and practices of sustainable development into all aspects of education and learning. Here there was a broad approach at the time linked to (a) the Millennium Development Goals (MDG) where education was a major asset and an important input as to “ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling”, (b) the movement “Education for All” (EFA) (whose focus is to provide education of quality for all) and (c) “United Nations Literacy Decade” (UNLD) concentrating on promoting the key-tools for all forms of structured learning.

Tilbury & Mulà (2009) stressed that the path to SD require a new mental framework and action enabling us to transform the way we create choices and view the future. Education and learning are therefore key activities in order to facilitate the critical process and change mentalities, according to DESD (2005), and HEIs were critical "actors" of this whole process because they prepare the policymakers and leaders of tomorrow.

On the one hand, the HEI leaders' signature and commitment made them as SD catalysts and gave a promotional sustainable “signal” as reported by Karatzoglou (2013), which may be verified from multiple Declarations, Letters or Initiatives concerning ESD in Higher Education in a previous DESD period. The *Talloires* Declaration was determinant in the definition of sustainability in terms of HEI as it had been signed in 1990 by more than 265 presidents in 40 countries on five continents as admitted by Clugston & Calder (1999).

On the other hand, and considering ESD applicability, the *Copernicus* Charter resulted from the Conference of European Rectors (CRE, 1994), which was signed in 1994 by over two hundred universities.

After the DESD 2005-2014, the Nagoya Declaration not only reaffirmed the stakeholders' commitment over the previous 10-year period but also celebrated the achievements "[...] in putting ESD higher on national and international agendas, advancing policy, improving the conceptual understanding of ESD, and generating substantive good practice amongst a wide range of stakeholders" (UNESCO, 2014: 1). The aim was enabling HEIs to achieve the objectives set in Rio de Janeiro by supporting the realignment of economic, social, cultural, and environmental and education goals. The Nagoya Declaration also opened the way for a set of follow-up initiatives, such as the commitment to build and launch the Global Action Program (GAP) on ESD and a concrete contribution to the post-2015 agenda that aims to generate and scale-up ESD actions at all levels and areas of education, training and learning. For that, five priority action areas for ESD, through inclusive quality education and lifelong learning via formal, non-formal and informal settings, were defined (UNESCO, 2014).

The commitments continued after 2014, by the reinforcement of UN Sustainable Development Goals (SDGs), following the MDG, namely, "quality education" (SDG 4) (Beynaghi et al., 2016; Brudermann et al., 2019). There is a growing recognition that education will play a key role in the global effort to achieve the UN's sustainable development goals (Hallinger & Chatpinyakoo, 2019). This is reflected in the outcome document "Transforming our World: the 2030 Agenda for Sustainable Development" (United Nations, 2018).

The world community is engaged in pursuing the Sustainable Development Goals (SDGs) meaning that an unrivalled opportunity is provided to HEI, both in respect of teaching and in research, on individual SDGs, as well as in pursuing their "third mission", linking up with external stakeholders and society (Leal Filho et al., 2019). Notwithstanding students ("learners") go to the universities to acquire the knowledge and skills needed to promote SD through EDS and sustainable lifestyles, among many other contributions to SD (Brudermann et al., 2019) few HEIs have realized it and many are falling behind (Leal Filho et al., 2019).

Educational initiatives often appear after societal ones (Lozano et al., 2013). Nevertheless, ESD reflects not only policy demands but also the transformation of the epistemological view in science and education (Dlouhá et al., 2013).

1.3.2. How to assess SD implementation at HEI

Archival research, namely through systematic documental analysis of plan, policies, strategies and reports develop by HEIs is very important to this kind of study, complementing primary data as self-reports, questionnaire surveys and structured interviews. This qualitative tool allows a detail analysis usually not possible through questionnaires surveys, in which response rates are often low, and additionally fulfilled by the own institutions. This constitutes a limitation on the treatment and analysis of data.

Additionally, collecting data using face-to-face interviews or archival research as a strategy suggests that the data collected through personal interaction with participants is more highly valued than views expressed through responses to an anonymous questionnaire (Saunders et al., 2009).

Planning in sustainable development is believed to be an important element in allowing HEIs to set their goals and to commit themselves towards under-taking concrete actions and measures at all levels in order to implement sustainability (Leal Filho et al., 2019). Nevertheless, until now, there is a shortage of research looking at the extent to which planning for SD may help HEIs to assess their performance and to determine whether the aims of their strategies and practices have been met (Leal Filho et al., 2018b).

1.3.3. The whole-institution approach and the implementation of ESD in HEI' framework

According to Sinakou et al. (2019) there are three major factors in ESD practices (a) international policy documents which shaped ESD, (b) academic discourse in the field of ESD and (c) students and teachers.

HEI implementation practices related to ESD could be integrated according to a whole-institution approach (UNESCO, 2012a), which is fundamental for a transformation in learning and education for sustainability with interdisciplinary collaboration between

academics (Kapitulčinová, et al. 2018; Leal Filho, et al. 2018a), as Member States' task is defined by the four major thrusts of ESD while recognizing their leadership role. These are: (a) improving access to quality basic education, (b) reorienting existing education programmes, (c) developing public understanding and awareness, and (d) providing training. All of them are linked to Lozano et al. (2015) dimensions.

The *whole-school approach* is also important for promoting the needed transformation in students to become agents of a sustainable future (Leal Filho, et al. 2018a).

Fischer et al. (2015) mention the four dimensions of SD, namely the core activities of HEIs, education, research, operations, and community engagement.

Northern and western European countries had conducted integrated studies on SD in HE, that is demonstrated in Sweden (Lotz-Sisitka, 2004) and Wales (Glover & Peters, 2013), which are two centralized systems showing how sustainability can be implemented in HEI. In the Belgian University College Katholieke Hogeschool Leuven, the bottom-up approach was successfully connected with a top-down approach. This is a case study that showed a mixed implementation of ESD in a single university but could represent a good example of what is being done in this Central Western European country (Verhulst & Lambrechts, 2015).

Nevertheless, there are countries, in the post-socialist states of Central and Eastern Europe, namely, Czech Republic and Poland (Dlouhá & Burandt, 2017) where there is a noticeable lack of research and documented evidence to investigate sustainable development in higher education.

In Spain, a South-western country a top-down action or a cascade process took place as to initiate the commitment process and the subsequent actions in HEI and the Spanish Government developed the 2015 University Strategy to adapt universities to the guidelines proposed by the European higher education area (Lárran Jorge et al., 2015).

In Portugal, no attempt has been made to evaluate in detail how public HEIs are incorporating ESD at policy and strategy level and how it was implemented within the framework and goals of DESD 2005-2014. Aleixo et al. (2016; 2018) mention that the Portuguese Public HEIs show, in the first place, awareness in the way they communicate, through institutional documents or websites and their leaders reveal that their institutions

have already started to include SD in communication. This is of the utmost importance as Leal et al. (2019) refers that universities' role is making their know-how more widely available.

Notwithstanding these earlier studies, it is important to understand how HEIs in Southern European countries, like Portugal, are implementing ESD where there is no centralized system for ESD integration, including specific policies and strategies, but where public universities have strong autonomy from the government.

1.3.4. Barriers and challenges HEI face to implement ESD

Many studies have been conducted to discuss the main barriers and challenges HEI are facing to implement ESD and how they can overcome them. Leal Filho (2015) wondered about the success of the follow-up initiatives, as GAP because many of the problems that were seen during the UN DESD remained unsolved. The absence of formal commitments to sustainability in many universities and the lack of formal plans or strategies, which indicate the absence of a sense of direction concerning where an HEI may go, are some examples which prevent comparisons to assess progress. Leal Filho (2015: 1) calls this new age [post UN 2015] "Sustainability 2.0".

Leal Filho et al. (2017a) added that there are still numerous barriers to overcome, namely the absence of integration in teaching, research and extension towards the integration of ESD in curricula and research and, most importantly, to include it holistically in their systems, despite successful developments in the field of HESD over the past 15 years. There seems to have been an evolution compared to what has been referred by Leal Filho (2000) as main barriers to SD implementation namely, (i) ignorance and misunderstandings of the SD concept, (ii) lack of recognition of the existence of contradictions in the university whose cause may be attributed to ambiguity and complexity of actual sustainability concept, which is seen as an abstract and complex topic (Leal Filho, 2000; Shirberg & Harris, 2012), and (iii) institutional reluctance to change.

Additionally, the lack of financial resources and funding (Figueredo & Tsarenko, 2013; Shirberg & Harris, 2012; Waas, 2012) is a barrier to consider as sustainability practices are

still associated with financial investments and “sustainability is not a first priority for many universities” (Velazquez et al., 2005: 285).

Nevertheless, there are still barriers to be addressed that may be regarded as preconditions for universities to successfully implement long term sustainability initiatives: (i) lack of planning (as a major), (ii) non-adoption of a whole-school approach for embedding sustainability, (iii) lack of financial resources to support sustainability initiatives (Leal Filho et al., 2018b). The latter depend greatly on human resources commitment and on the durability of the support.

The new trends in society and technology in the course of the fourth industrial revolution come with challenges, but also provide opportunities (Brudermann et al., 2019) and so the barriers that universities face that can be seen as drivers for SD from the UN DESD 2005-2014 ahead.

1.4 Methodological approach and research design

Considering that the nature of the research problems would develop along the research process, it was decided for a mainly inductive-oriented approach based on archival research and *Grounded-Theory* (Saunders et al., 2009) where mixed-methods research design (Bryman, 2012) were used. The most common used methods were qualitative, content analysis (secondary data) as semi structured interviews (primary data), and yet quantitative methods were also used (in primary data treatment). The focus was to study the fourteen public universities profile in Portugal.

In the following headings the main methods used for each specific objective is explained.

1.4.1. Assess the extent (if and how) to which the Portuguese Government and the Ministry integrated sustainability in their plans, programmes and policies

A mixed-methods research design appeared to be most suitable in order to conjugate the qualitative (mostly) and quantitative aspects of the specific objectives defined above and so the methods were settled:

It was used the qualitative approach using content analysis, assisted with qualitative data analysis software NVivo 10, based on Bardin (1977) methodology. It consisted of classifying the information disclosed in different categories that represented different dimensions of integrating sustainability in the plans, programmes and policies to assess the extent to which the Portuguese Government and the Ministry did implement it.

1.4.2. Assess how public Portuguese universities implemented sustainability in their plans, programmes and policies according to some key actors' perspectives with decision making impact

The exploratory study followed a mix (qualitative and quantitative) approach with semi-structured interviews (Bryman, 2012) that was conducted after gathering a convenience sample whose access to the individuals was institutionally scheduled, of fifteen key actors with a role in the decision making processes of Portuguese universities policies (government bodies and major key actors in the Portuguese universities i.e. from Portuguese University Council of Rectors (CRUP)) to assess how the public Portuguese universities implemented sustainability in their plans, programmes and policies.

In earlier studies, references to ESD were scarce in governmental plans, policies and programmes in Portugal, specific documents about ESD at the higher education level were non-existent. Therefore, the interviews (based on interview script with research questions) were intended to provide a better understanding of the compromises concerning ESD in Portuguese public universities, as well as the possible ways of implementing the DESD goal and their impact on strategies and actions.

For the qualitative content analysis (Bardin, 1977) it was used NVivo (version 11) software and the quantitative aspects were treated by descriptive analysis.

1.4.3. Analyze the extent to which ESD has been integrated in universities through their strategic plans, sustainability reports and activity plans and reports

This part of the research used a qualitative approach based on a detailed content analysis, assisted with qualitative data analysis software NVivo 11, based on Bardin (1977) methodology. There were analyzed Institutional documents, for each university, corresponding to the period 2005 to 2014 (i.e., a 10-year period) such as Plans (PAs – activities Plans, PDEs – Strategic Development Plans, and PEs – Strategic Plans), Reports (Activity Reports (RAs), Strategic Activity, Accountability Reports (RCs), and Sustainability Reports (RSs)), and QUARs. The aim was to analyze the extent to which ESD has been integrated in universities through the mentioned documentation.

The content analysis of secondary data can be a helpful source of information not only to get to know better the universities concerning initiatives towards sustainability and best practices, but also to organize complementary interview scripts. Nevertheless, not being feasible to use all secondary data is one of the characteristics that should be considered (Hox & Boeijs, 2005).

1.4.4. Analyze the different self-reported ESD practices of the last 15 years and propose a think tank of initiatives to be applied by Portuguese HEIs.

In this final part of the research a mix (qualitative and quantitative) approach was used with semi-structured interviews (Bryman, 2012) based on the seven dimensions of the HEI proposed by Lozano et al. (2015) were conducted to the relevant role actors on the sustainability implementation at the universities

Thirteen interviews were undertaken and analyzed. The aim was to analyze the different self-reported ESD practices of the last 15 years and propose a think tank of initiatives to be applied by Portuguese HEI.

For the qualitative content analysis (Bardin, 1977) NVivo (version 11) *software* was used. The quantitative data was analyzed by a combination of descriptive statistics and Extreme Balance Answers (EBA).

The descriptive statistics of the Likert based questions provided a description of the key variables of the investigation (Jupp, 2006) and a preliminary analysis. The descriptive analysis was computed in Statistical Package for the Social Sciences (SPSS), version 24. According to Tastle & Wierman (2007), the frequency distributions were converted to percentages to provide a standardized way to compare between and among the categories. The Extreme Balance Answers (EBA) (Zilhão et al., 2008) is a method used in OECD countries and in many qualitative surveys. It transforms one scale into another (using different weights) between -1 or +1, where values close to -1 mean full disagreement and values near +1 mean full agreement. The EBA was only applied to the five-point Likert scale-based questions concerning barriers to ESD implementation during DESD 2005-2014.

1.5 Structure of the thesis

Due to the chosen research design, the research development was sequential. Figure i shows the general aim, specific objectives of each research stage with the corresponding methods applied.

The respective research phases are mirrored in the thesis' chapters, referred to as Chapters 1 to 4 (see Figure i).

This thesis has a cumulative format and is based on four peer review scientific publications (one currently under review but accepted), resulting from the different research stages. The publications were organized in four main parts.

(i) Assess the extent (if and how) to which the Portuguese Government and the Ministry of Higher Education, Science and Technology integrated sustainability in their plans, programmes and policies within the framework and goals of the United Nations (UN) Decade of Education for Sustainable Development (DESD) 2005-2014.

This part frames the analysis of Governmental and Ministerial documents concerning the period 2005-2014 for this study and is based on the book chapter: "Farinha, C., Azeiteiro,

U.M., Caeiro, S. (2017). Education for Sustainable Development Through Policies and Strategies in the Public Portuguese Higher Education Institutions. In Leal Filho, W.; Azeiteiro, U.; Alves, F. & P. Molthan-Hill (Eds.), "Handbook of Theory and Practice of Sustainable Development in Higher Education" in the series "World Sustainability Development Series", Springer, Cham, 275-290. https://doi.org/10.1007/978-3-319-47877-7_19".

This chapter offers a critical analysis about if and how was the integration of sustainability in public HEIs through policies and strategies from the Government and the Portuguese Ministry of Higher Education, Science and Technology within the framework and goals of the United Nations (UN) Decade of Education for Sustainable Development (DESD) 2005-2014 (first specific objective (see also Figure i).

(ii) Assess how Public Portuguese universities implemented sustainability in their plans, programmes and policies according to some key actors' perspectives with decision making impact within the framework of the UN DESD 2005-2014.

This part deals with the perspective of key actors concerning how sustainability has been integrated into the policies and strategies of HEIs, particularly Portuguese public universities and is based on the journal article: "Farinha, C., Azeiteiro, U., Caeiro, S. (2018). Education for Sustainable Development in Portuguese Universities Institutional Framework: The key actors' opinion. International Journal of Sustainability in Higher Education, 19 (5), 912-941. <https://doi.org/10.1108/IJSHE-09-2017-0168>".

This article used semi-structured exploratory interviews conducted with seven key actors with a role in the decision-making processes in Portuguese Higher Education Sector allowed access to other inaccessible plans, policies and programmes that were not publicly accessible in part I and the interviewees informed about to what extent implementation was done in HEIs.

The results of this research phase establish the ground and the need for the analysis of universities' plans and reports in the next stage of the research.

(iii) Analyze the extent to which ESD has been integrated in universities through their strategic plans, sustainability reports and activity plans and reports within the time frame of UN DESD 2005-2014.

This part evaluates the extent to which ESD has been integrated in public Portuguese HEIs through the analysis of the universities' strategic and activity plans, as well as activity and sustainability reports, conducted within the timeframe of UN DESD 2005-2014.

The analysis of these documents allowed compiling some sustainability implementation actions and best practices and pre-defining the country profile, as well as a proposal of a think tank of initiatives.

Based on the country profile, each Portuguese university could share with all stakeholders (teaching staff, students, and community) all the initiatives and (best) practices in order to increase knowledge of the work that has been done, namely in terms of partnerships, fundraising, and other actions implementing sustainability. For that it is presented Sustainability4U, a platform for sharing sustainability initiatives.

The results were published in "Farinha, C., Caeiro, S., & Azeiteiro, U. (2019). Sustainability Strategies in Portuguese Higher Education Institutions: Commitments and Practices from Internal Insights. *Sustainability*, 11(11), 3227. MDPI AG. <https://doi.org/10.3390/su11113227>".

The analysis of these documents allowed compiling some sustainable implementation actions and best practices, and pre-defining the country profile as well as a proposal of a think tank of initiatives. This may be undertaken as Sustainability4U, a platform that may be used as a support to enlarge the knowledge transfer and share (best) practices.

(iv) Analyze the different self-reported ESD actions and practices of the last 15 years and propose a think tank of initiatives to be applied by Portuguese HEI.

This last part presents a final contribution to bridge the lack of information on the extent to which sustainability has been integrated into the policies and strategies of Portuguese public universities, during the last 15 years, within the framework of the United Nations Decade of Education for Sustainable Development DESD 2005-2014, and their insights for the future.

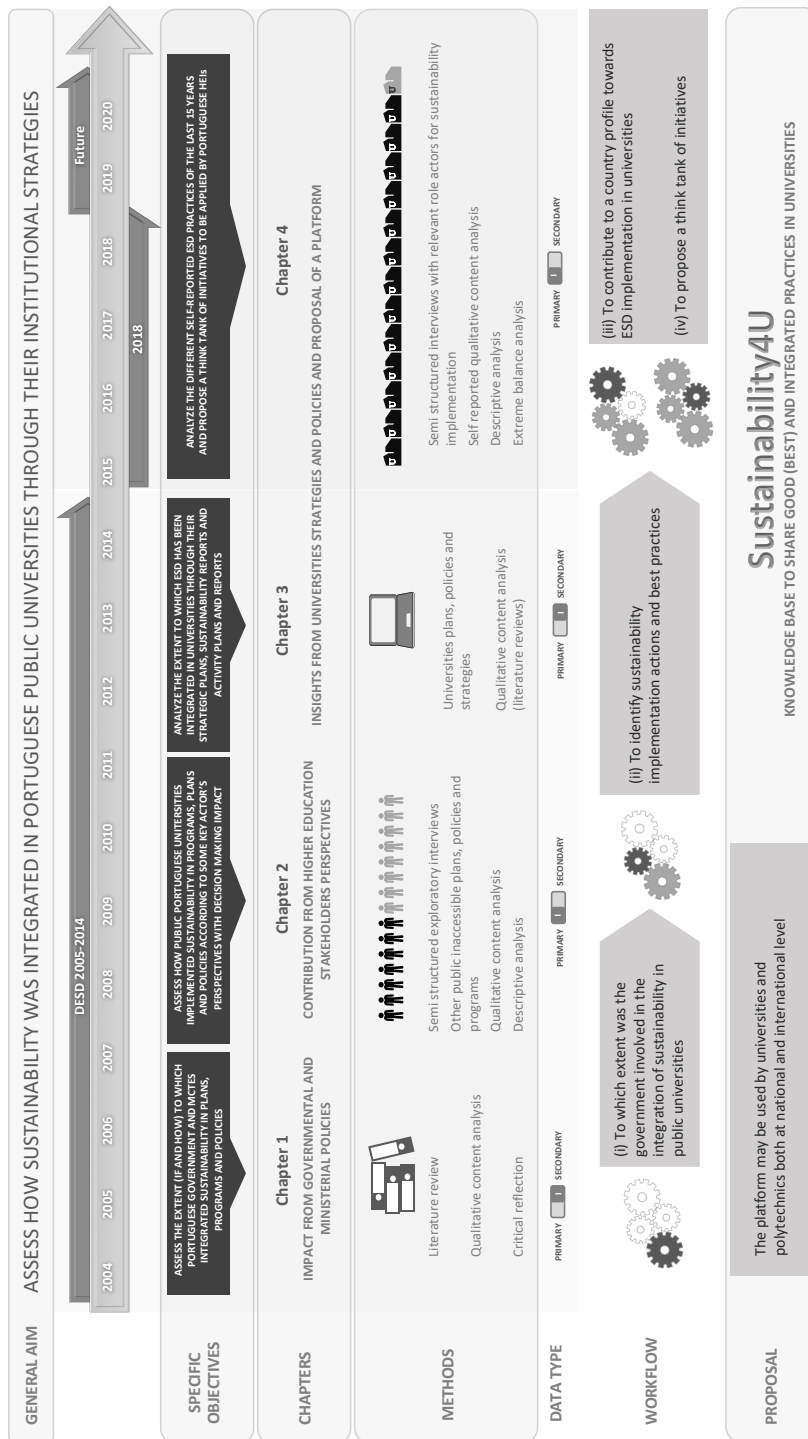
It is highlighted the key areas where HEIs could address barriers to and face challenges to sustainability where a range of initiatives is put forward to enlarge the knowledge and sharing good and integrated practices in Portuguese HEIs.

This part contributes to the definition of a country profile for the implementation of sustainability in the HE sector through the Sustainability4U platform. As mentioned, this may be used as a support to the transfer of knowledge and sharing of (best) practices not only between Portuguese universities but also at European and international levels based on a case study of a European Southern country. Similar regions or similar profiles can learn from this experience and avoid the same mistakes and barriers.

The period 2005-2014 and 2018 (present time), was considered an opportunity to verify if the DESD principles have been applied in the Portuguese universities concerning policies and/or strategies. Moreover, in 2014 with the adoption of GAP it was agreed the need to pursuit SD initiatives when UNESCO World Conference on ESD was held in Aichi-Nagoya.

This part deals with the perspective of relevant role key actors concerning how sustainability has been integrated into the policies and strategies of Portuguese public universities and is based on "Farinha, C., Caeiro, S. and Azeiteiro, U. (2020), "Universities speak up regarding the implementation of sustainable development challenges: The case of Portugal", *International Journal of Sustainability in Higher Education*, 21 (3), 465-506. <https://doi.org/10.1108/IJSHE-08-2019-0250>".

Figure i Research development and thesis structure



These four parts are accompanied by this preceding chapter, serving as a general introduction to the thesis, and a last chapter about final recommendations, conclusions and a proposal platform (Sustainability4U) in which the research questions are answered, and a think tank of initiatives can be shared as well as integrated and best practices.

Limitations of the study as well as an outlook on future research are included in the last chapter of this thesis, followed by the bibliography that compiles all cited sources of all chapters.

At the end, four appendices are provided, in which all relevant research materials, such as Letters of invitation requesting interviews (Chapter 2 and 4) (Appendix A), Interview Scripts (Chapter 2 and 4) (Appendix B), Journal Article Appendix (Chapter 3) (Appendix C) and presentations at Conferences, Seminars and Symposiums where papers were presented internationally and nationally (Appendix D).

Some organizational notes:

- Having opted for a cumulative thesis format, there are sections that may appear repetitive, as the research topic is introduced and contextualized in every publication.

CHAPTER 1

Education for Sustainable Development through policies and strategies in the Public Portuguese Higher Education Institutions

References: Farinha, C., Azeiteiro, U.M., Caeiro, S. (2017). Education for Sustainable Development Through Policies and Strategies in the Public Portuguese Higher Education Institutions. In Leal Filho, W.; Azeiteiro, U.; Alves, F. & P. Molthan-Hill (Eds.), "Handbook of Theory and Practice of Sustainable Development in Higher Education" in the series "World Sustainability Development Series", Springer, Cham, 275-290.

Available at: https://doi.org/10.1007/978-3-319-47877-7_19

Abstract

Many European countries, particularly in Northern Europe, have conducted integrated studies on Sustainable Development in Higher Education. In Portugal, no attempt has been made to evaluate how Public Higher Education Institutions (HEI) are incorporating Education for Sustainable Development (ESD) at policy and strategy level and how it was implemented within Ministry of Education and Science. The aim of this paper is to discuss the integration of sustainability in the 14 public HEI in Portugal through policies and strategies within the framework and goals of the United Nations Decade of Education for Sustainable Development (DESD) 2005-2014. The methodological approach is based on a documental content analysis where pre-selected key terms were used after a review of the literature in a deductive approach theory. Documentary research on policies, plans and programmes from the Governmental Great Planning Options as Governmental Constitutional Plans and the Portuguese Ministry of Education and Science was performed through the analysis of the possible forms of implementation of DESD, and their consequent impacts on strategies of the public Institutions taking part of the Portuguese Council of Rectors. Given that 2014 was the final year of DESD 2005-2014 and 2005 was the Millennium Development Goals (MDG) assessment year, the integration of sustainability through policies and strategies in the Public Portuguese HEI is on schedule. More detailed studies must be undertaken at a later stage, namely interviewing the key stakeholders in the Government, Ministry of Education and Science or Portuguese University Rectors Council (PURC). Notwithstanding some international drivers and a few practical examples at University level, preliminary results showed that ESD is still in its early stages of development and that there is a lack of national integrated strategies or policies. We do

believe that there is an absolute need for a change in the paradigm of Portuguese HEI and several barriers to overcome, as from learning as from the application of best practices from other European and worldwide countries. This paper will be useful to academics and researchers interested in further develop the topic of integration of sustainability through policies and strategies in Public HEI in Portugal.

Keywords: *Education for Sustainable Development; Decade of Education for Sustainable Development; Governmental Constitutional Plans; Governmental Great Planning Options; Portuguese Higher Education Institutions; Sustainability.*

1 Introduction

In the last decade many researches have been developed to evaluate how Sustainable Development has been applied and implemented in Higher Education Institutions (HEI) (Lozano et al., 2015). In Portugal, no attempt has been made to evaluate in detail how Public HEI are incorporating Education for Sustainable Development (ESD) at policy and strategy level and how it was implemented within Ministry of Education and Science. Taking into account that the Decade finished in 2014 (the last year of this UNESCO program) this is an opportunity to verify if the aforementioned principles have been applied in the Portuguese context by the implementation of policies and/or strategies of the multiple HEI. To accomplish these two main goals were defined for this study:

- 1) How and the extent to which the Portuguese Government integrated the sustainability in their plans, programmes and policies;
- 2) The extent to which the Ministry of Education and Science had done so with some of the documentation produced in the period 2005-2014.

2 Theoretical Framework

The level of achievement and accomplishment of integrated studies on SD and sustainability in Public Portuguese HEI it is not yet comparable to those in many European countries, particularly in Northern Europe. As example we mentioned the transformation of HE towards sustainability in Sweden. “The time required fostering transformation in HE towards sustainability is a slow process, but possible! (...) The research reviews progress made by a number of Swedish universities following a 1996 requirement that all Swedish public authorities (including universities) were made responsible for contributing to the sustainable development of the society” (Lotz-Sisitka, 2004). Other good examples can be seen in German and Czech Republic, although more specific in certain Universities due to important research groups working at the level of curricula and educational and pedagogical tools (see for example (Dhouhá, J. and Burandt, S., 2015)). In fact European countries are more familiar with or are more interested in ESD in HES discourses than educators from other regions of the world (Lozano et al., 2015).

Portugal has 14 Public HEI geographically spread and the studies and discussion about the integration of sustainability through policies and strategies within the framework and goals of the International Decade for Education for Sustainable Development concerning 2005-2014 (DESD 2005-2014) proclaimed by the General Assembly of the United Nations is far beyond what it should be. Nevertheless, Aleixo et al. (2016) refer few good examples like: 1)“ (...) Portuguese Public HEIs are predominantly at an early stage of SD and, based on their policies and strategies, SD seems to be incremental”, and 2) “Portuguese Public HEIs show, in the first place, awareness in the way they communicate, whether through institutional documents or websites”.

Hopkins (2012) refers that despite all “(...) it is almost impossible to identify the exact origin of education for sustainable development (ESD). Each of us in the field has a story of our initial reaction when and where we first became aware of it”.

The final document about Sustainable Development from United Nations Conference, which is globally known as Rio+ 20 Conference (2012) was approved in 22th June 2012 and

adopted by far more than 190 countries. About Sustainable development (SD) one can read:

We encourage Member States to promote [its] awareness among youth, inter alia by promoting programmes for non-formal education in accordance with the goals of the United Nations Decade of Education for Sustainable Development, 2005-2014.

According to DESD (2005-2014): International Implementation Scheme (2005), the aims were quite clear namely those related to (1) helping countries to make progress towards and attaining the Millennium Development Goals (MDG) through ESD efforts and (2) providing countries with new opportunities to incorporate ESD into education reform efforts). At the time there was a broad approach: DESD implementation efforts were linked to multiple processes: a) MDG as there were 8 goals and 18 measurable targets where education was a major asset and an important input as to “ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling”, b) the movement “Education for All” (EFA) (whose focus is to provide education of quality for all) and c) “United Nations Literacy Decade” (UNLD) (concentrating on promoting the key-tools for all forms of structured learning). The milestones for DESD were listed in the implementation scheme as well as the strategies for integrating ESD as there was “(...) a commitment that will be implemented by Member States according to their priorities and approaches” (DESD, 2005).

It was reported by Tilbury & Mulà (2009) that the path to SD required new mental framework and action which enables us to transform the way we create choices and view the future. Education and learning are therefore key activities in order to facilitate the critical process and change mentalities, according to DESD (2005) and HEI was a critical "actor" of this whole process because it prepares the policymakers and leaders of today and tomorrow. On the one hand, the HEI leaders' signature and commitment made them as SD catalysts and gave a promotional sustainable “signal” as reported by Karatzoglou (2013), which can be verified from multiple Declarations, Letters or Initiatives concerning ESD in Higher Education in a previous DESD period. The Talloires Declaration was

determinant in the definition of sustainability in terms of HEI as it had been signed in 1990 by more than 265 presidents in 40 countries on five continents as admitted by Clugston & Calder (1999). On the other hand, and taking into account ESD applicability, the Copernicus Charter (Co-operation Programme in Europe for Research on Nature and Industry through Coordinated University Studies) resulted from the Conference of European Rectors (CRE, 1994, 2003), which was signed in 1988 by far most than 2 hundred universities, mentions that:

Universities and equivalent institutions of higher education train the coming generations of citizens and have expertise in all fields of research, both in technology as well as in the natural, human and social sciences. It is consequently their duty to propagate environmental literacy and to promote the practice of environmental ethics in society

Given the very rapid political changes after 1989, taking the word of AdomBent et al. (2014): “the many claims on scarce resources and the at times bewildering need for creative thinking in order to adjust quickly to a rapidly changing environment, it is understandable that CEE governments and ministries of education have given relatively low priority to what they perceive (or better, misperceive) as a ‘fashionable trend’”. Even though Council of the European Union (2010) emphasizes the need for greater recognition of ESD:

Education is a prerequisite for promoting the behavioral changes and providing all citizens with the key competences needed to achieve sustainable development.

Higher Education leaders have to be committed to sustainability by integrating it into policies and strategies; showing the commitment by signing a declaration, charter, or initiative; establishing short-, medium-, and long-term plans for its institutionalization; and ensure that sustainable development is implemented throughout the HE system (Lozano et al., 2015).

As stressed earlier Northern Europe had conducted integrated studies on SD in HE, and despite Tilbury (2004) criticism about the lack of investment in ESD area, it is recognized that for example the drive for HE in Wales to be at the forefront as reaffirming its role in contributing to a sustainable future coming from the top, what is required to support possible success. The Welsh model is considered to be a Capability Maturity Model and there was adherence to Government priorities in strategic plans aligned with strong leadership according to Glover & Peters (2013). Even in Spain, where there is a lack of sufficient studies that investigate sustainable development in higher education, there were increasing attraction levels of attention from both the public and policy makers in recent decades, namely a number of previous studies that have called for a more comprehensive integration of sustainable development into university operations and curricula according to Lárran et al. (2014). In 2002, Alba & Blanco (2008) mentioned that the Committee of Rectors of the Spanish Universities (CRUE) approved the creation of a Work Group about the environmental quality and the SD in the Spanish Universities. A top-down action or a cascade process took place as to initiate the commitment process and the subsequent actions in HEI:

One of their main goals is to encourage the participation of Spanish HEI's by means of the exchange of experiences and through the development of joint projects. This group is made up of thirty universities, and its most important actions are the thematic seminars organized within different conferences and workshops twice a year.

As a step forward the Universidad Autónoma de Madrid (UAM) did a survey as to assess the Universities situation concerning sustainability up to date (2006) using the Sustainability Assessment Questionnaire (SAQ) of United Leaders for a Sustainable Future (ULSF), that allowed the analysis of the commitment and the planning for sustainability through technical questions and inclusion of the thematic in the Strategic Plans. From the survey results it was concluded that the sustainability in Spain was implemented by the great involvement of the CRUE (Alba & Blanco (2008)).

Portugal has not yet done any evaluation in detail how Public Higher Education Institutions (HEI) are incorporating ESD at policy and strategy level and how it was implemented through the Government and/or the Ministry of Education and Science. This study aimed to discuss the integration of sustainability in the 14 public HEI in Portugal through policies and strategies within the framework and goals of the United Nations Decade of Education for Sustainable Development (DESD) 2005-2014.

3 Methods

3.1 Sample, data collection, analysis and treatment

In order to measure and analyze how and the extent to which the Portuguese Government had integrated the sustainability in their plans, programmes and policies, a content analysis of all the Great Planning Options (GPO) (2005-2009, 2007, 2008, 2009, 2010-2013, 2012-2015, 2013, 2014 and 2015) as well as the three Constitutional Governmental Programmes (CGP) (XVII (2005 to 2009), XVIII (2009 to 2011), and XIX (2011 to 2015)) was carried out. Those documents were available at the Portuguese Parliament website (Republic Assembly (2015)).

The qualitative approach using content analysis, based on Bardin (1977) methodology, consisted of classifying the information disclosed in different categories that represented different dimensions of integrating sustainability in the plans, programmes and policies under analysis.

The data collection was carried out in October 2015. In order to analyze and treat the data we developed a coding system bearing in mind the selection of terms or mix terms (see table 1) that were gathered after a content analysis of systematic review.

In order to evaluate the integration of sustainability in plans, programmes and policies at the Ministry of Education and Science we did also a content analysis as we intended to study “if and how Portugal in its Education Reform implemented Sustainability through strategies and policies during DESD 2004-2015 in the public Universities?” Nevertheless, the documentary sources were not so easy to gather as it seemed there was a lack of

national integrated strategies or policies, plans or programmes concerning integration of DESD 2005- 2014 into Portuguese HEI. The documents were collected through internet, library search and personal contacts to employees of the Ministry.

The documents were gathered and organized chronologically:

1. Law n.62/2007, 10th September - Legal status of higher education institutions [Lei n.º 62/2007 de 10 de Setembro - Regime jurídico das instituições de ensino superior,
2. National Strategy for Development Education (2010-2015),
3. Decade of United Nations for Education for Sustainable Development (2005-2014): Contributions for its dinamization in Portugal [Década das Nações Unidas da Educação para o Desenvolvimento Sustentável (2005-2014): Contributos para a sua dinamização em Portugal],
4. State of Education 2012: Autonomy and Decentralization (Estado da Educação 2012: Autonomia e Descentralização),
5. A trust agreement in higher education for the future of Portugal: Investing in the future [Um contrato de Confiança no Ensino Superior para o futuro de Portugal: Investir no futuro (2010-2013)].

The “National Strategy for Development Education” five year participatory strategical document engaged by PIDS (2009) (IPAD – Instituto Português de Apoio ao Desenvolvimento) and other governmental and non- governmental actors as UNESCO is the responsible organization for the DESD implementation because it is their responsibility the invitation of the Governments to be involved on the inclusion of ESD in their Educational as ED should be assumed as an important instrument for the universal and quality access in the long run and so contribute to the solid commitment of all the people.

NVivo version 10 software was used for the quantitative content analysis of the selected documents, and it was “searched” for word(s), text (see Table 1) and build some codification matrixes in order to look for:

- a. the most frequent words (top 20 with length less or equal to 10 characters) (see Figure 1, Figure 2, Figure 3 and Figure 4);
- b. the text after analyzed the data in order to have a cluster analysis; then we organized in nodes or categories (see Figure 5);
- c. the document coverage and the number of codified references taking into account the key words and the systematic review (5 documentary sources) in order to obtain a codified matrix and understand if, and how was the implementation of DESD in HE (see figure 6).

Table 1 Selected key words after a content analysis of systematic review

1. DESD – Decade for Education for Sustainable Development	8. Development
2. Environmental Education	9. Transdisciplinary
3. Sustainable Development	10. Holistic
4. Science for Sustainability	11. Integration
5. Environmental Management	12. Higher Education/Universities
6. Sustainability/Sustainable	13. Curricula/Curricular Plan/Curricular Programme
7. Environment/Environmental	14. Campus

Due to the relatively small number and quality of the documentary sources we were able to gather, despite our efforts, this outlines the limitations of our work and some constraints of this paper. Adding this we also consider these sources as a sample and so they cannot be regarded as representative, but this can show the lack of commitment from the governmental institutions towards ESD (we analyze this in the next section).

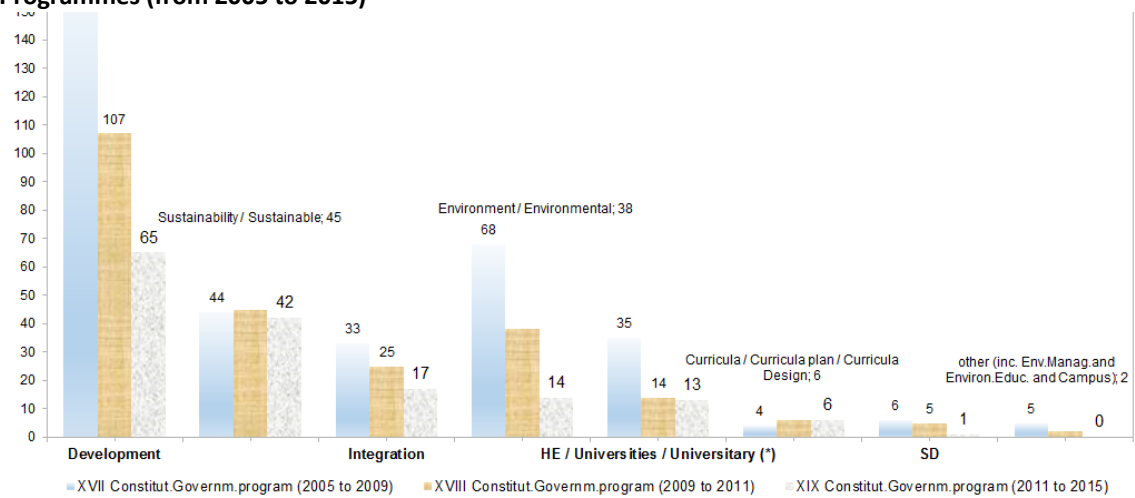
4 Results and Findings

4.1 *Governmental planning and Education for Sustainable Development*

After computing the key words (see Table 1) in the defined coding system we obtained the following results (Table 1, Figure 1 and Figure 3). In 2005-2009 CGP when searching for the main keywords by descendent order, “Development” was the main reference found, followed by “sustainability” or “sustainable” which didn’t seem to be as strange as in 2007 Portugal had had the approval of National Strategy for Sustainable Development, known as ENDS. Nevertheless, what we would expect was a large number of “Sustainable Development” (SD) references in 2005-2009 Governmental Program which seemed not to be so high (only 6 references). Concerning “universities” as well as “integration” altogether, both accounted for 20% of all the references and decreased in 10 year period time by 63% and 50%, respectively.

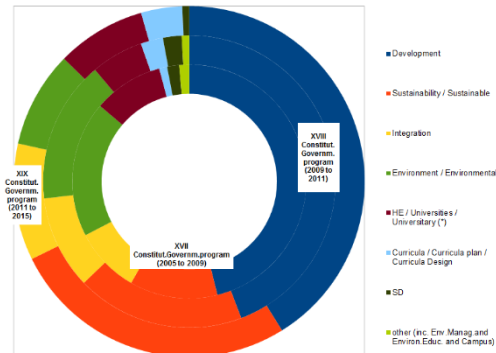
Even with a small number of references words related to “curricula”, it seemed to have enlarged their implementation during DESD period (see Figure 1).

Figure 1 Number of key words (words or text) references through the Portuguese Governmental Programmes (from 2005 to 2015)



From Figure 2 we observed that governmental results all over the DESD (2005 to 2014) period change: less “development” (decreased about 2/3 in 3 different Constitutional Government Programmes); less “environment” (-80%), less “sustainable development” which didn’t seem to have happened to “sustainable” or “sustainability” references (See figure 1) despite PIENDS (ENDS Implementation Program) in the XVII the Constitutional Government; So it was questioned if there hadn’t been other focus or if a change of paradigm had happen, from a narrow concept (“environment”) to a holistic and transdisciplinary concept, like “sustainability” or “sustainable”?

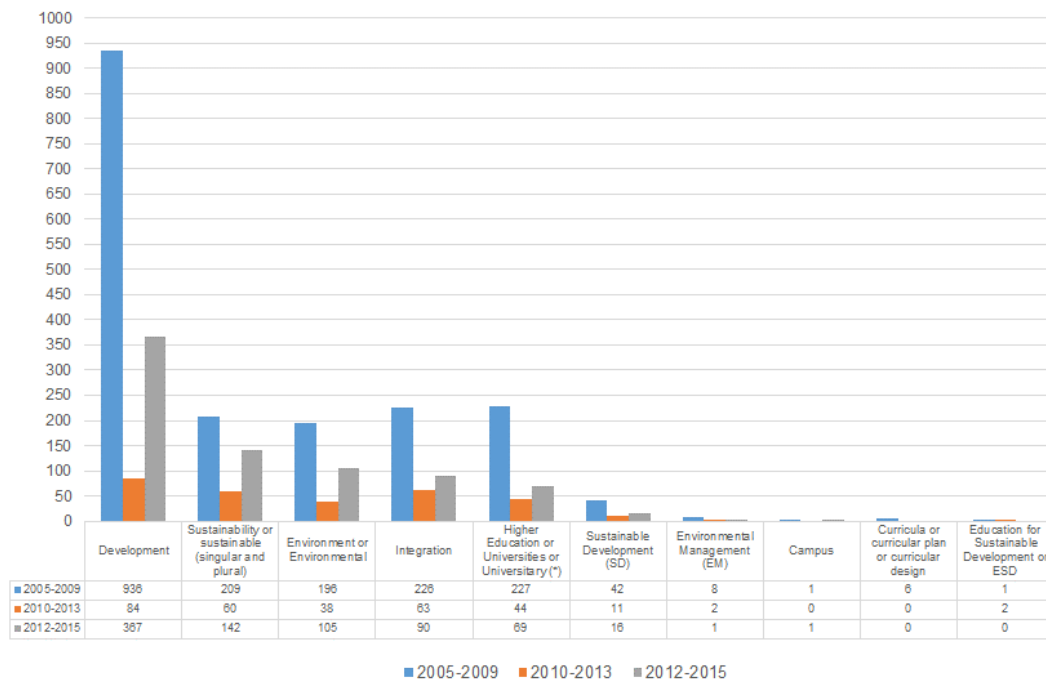
Figure 2 Number of key words (words or text) references through the Portuguese Governmental Programmes (from 2005 to 2015)



(a) This is a quadrennial GPO, so it is not totally comparable to the use of annual GPO

“Sustainability” or “sustainable” through the 3 different Governmental Programmes maintain the number of references in spite of the multiple scope they might have acquired. “Sustainability has entered the lexicon on the Growth Agenda (...) and innovation ((...) associated with serious delays in the process of qualification (...)” in 2005-2009 CGP; in 2009-2011 CGP one could read “the commitment to sustainability (...) refers to the policy of Development of scientific and technological capabilities, and scientific institutions, universities (...)” and these two contrasted with 2011-2015 CGP as “the sustainability is linked to budgetary commitments, Social Security (...), the National Health System (SNS)”, amongst other matters. Nevertheless, it didn’t happen when analyzing the number of key terms references in GPO during the same period (see Figure 3).

Figure 3 Number of key words (words or text) references in the Great Planning Options (GPO) (*) from 2005 to 2014 in Portugal ()**



Remark (*): We are referring to Constitutional Governmental Programmes and Great Planning Options and these Plans and Programmes are those that are not the specified ones referred in CRUP or within Universities.

Remark (**): GPO 2005 and 2006 are included in GPO 2005-2009 analysis as 2010 to 2013 in GPO 2010-2013 and lastly, 2012 to 2015 includes 2013 to 2015.

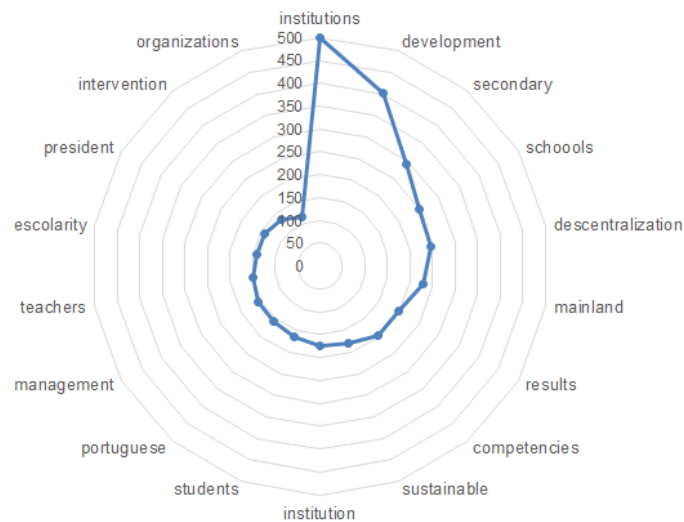
Although we obtained the same descending order when analyzing the frequency of keywords references that we had in figure 1 but the results here are not so conclusive. Nevertheless, we obtained references to ESD in Portugal, even in small number.

4.2 Ministry of Education and Science policies and the (un)leverage effect on HE

According to the Law n.62/2007, universities as other HEI are high level institutions oriented for the creation, transmission, and dissemination of culture, knowledge, science and technology through the linkage amongst studying, teaching, investigation and experimental development.

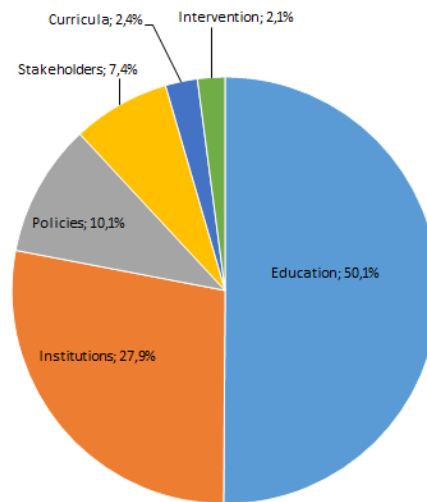
In Figure 4 “institutions”, “development” and “sustainable” appeared in the top 10 ranking (see Figure 4) out of top 20 ranking when we analyzed the words not as text but as individual words though when studying them in detail, they were not exactly in the context of ESD. And these findings resulted from the analysis of the five documents.

Figure 4 The top 20 of words references in the national documents related to ESD and DESD 2005-2014 in Portugal



When we analyzed the data, we decided to organize it in nodes or categories in order to have a cluster analysis. The nodes percentual distribution for the most frequent words (top 20 ranking) according to the documents can be seen in Figure 5.

Figure 5 The nodes percentual distribution for the most frequent words (top 20 ranking)



The node “Education” had had 50% of the references and here was included the Education for Development, followed by “Institutions” (28%) and then “policies” (10%) but when we looked up in detail it had not much to do with Plans, programmes or strategies related to ESD. “Institutions” are related not to HEI but to secondary institutions (79%), establishments or decentralization and “policies” related to public policies (44%).

From what can be read in UNESCO National Commission Forum – Portugal (2006) it seemed that the civil society made by itself a kind of a implementation movement towards ESD, as so we could not yet found any clear evidence that the integration of sustainability was led by Ministry of Education and Science through plans, programmes and policies until this point.

When analyzing document coverage and the number of codified keywords references (text/wording related to 14 key words (see table 1) to obtain a codified matrix in order to evaluate the integration of sustainability in plans, programmes and policies within the Ministry of Education and Science, we accomplished the following results (Figure 6):

- (a) A greater document coverage corresponds to the least codified references and there was a document that didn't show a single reference (the case of “A trust agreement

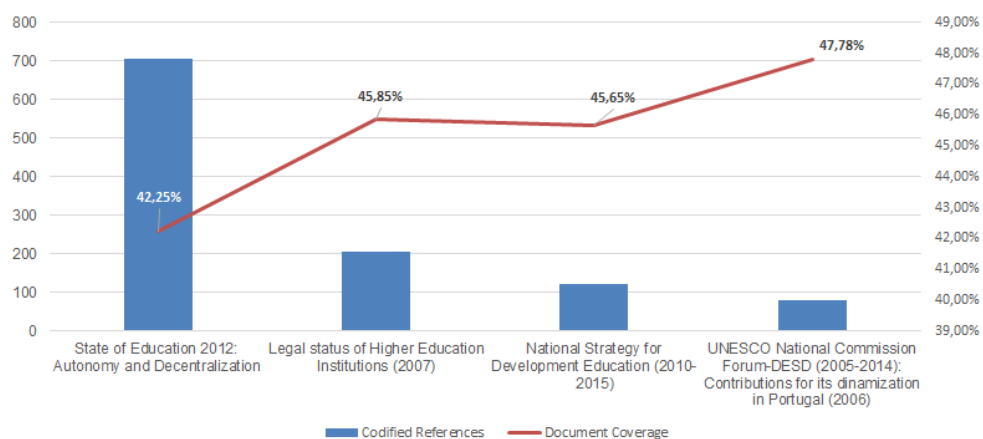
in higher education for the future of Portugal: Investing in the future”) and so we obtained data in 4/5 of the documentation analyzed;

(b) The document “UNESCO National Commission Forum-DESD (2005-2014): Contributions for its dynamization in Portugal (2006)” had a great coverage and not so many references as it was a 37 page document written by a Work Group whose purpose was to identify areas of priority intervention, propose transversal actions to create dynamism in multiple society sectors, and identify concrete projects capable of changing processes; nevertheless this document was aiming an application at all levels of education and not only at HEI level;

(c) On the opposite side there was “State of Education 2012: Autonomy and Decentralization”, a document that had the greatest references comparing to the others, but it was a report, and not a law, programme or a plan;

(d) With this analysis we could not have enough information to affirm categorially that there wasn’t a top down or even a mixed implementation of how sustainability was implemented in Portugal within the Ministry of Education and Science.

Figure 6 Number of codified keywords references and document coverage



5 Discussion

Lozano et al. (2015) mentioned as the result of an international survey to a large number of HEI many higher education institutions worldwide, in particular in Europe, have become involved in embedding sustainable development into their academic systems.

The results and findings of our work suggested however that in Portugal there hasn't been any incorporation of ESD at governmental policy and strategy level as through the Ministry of Education and Science in the Public Higher Education Institutions (HEI). As highlighted by Aleixo et al. (2016) Portuguese public HEI are predominantly at an early stage of SD and, based on their policies and strategies, SD seems to be incremental. Nevertheless, in Portugal six universities (Universidade do Minho, Universidade do Porto, Universidade de Lisboa, Universidade Técnica, Universidade Nova de Lisboa and Universidade Católica Portuguesa) signed the University Charter for Sustainable Development (Copernicus, 1993).

From Lozano et al. (2015) point of view there are strong linkages between the institution's commitment to sustainability, implementation, and signing a declaration, charter, or initiative and that the academic leadership's commitment was a leading cause for signing a declaration, charter, or initiative, and implementing sustainable development. For example, in Wales, a "small nation" of around 3 million people, the Government and Higher Education Funding Council for Wales have had plans and strategies of ESD implementation in HEI and adding these the sense of cultural identity that contributed to the cohesion within the citizenship agenda. These facts altogether could be seen as a great commitment from HEI with ESD (Glover & Peters, 2013). On the one hand, the Committee of Rectors of the Spanish Universities (CRUE) was responsible for the approval of the creation of a Work Group for the environmental quality and the SD in the Spanish Universities that had issued a set of guidelines to incorporate sustainability into the curriculum which indicated a top-down action or a cascade process, in a 47 million inhabitant's country. Both processes were top down approaches for the implementation of sustainability in HEI and showed commitment with it (Lárran et al., 2014).

At this point the findings as well as the non-institutional group that wrote the document “the UNESCO National Commission Forum – Portugal (2006)” created in 2006 proactively by the Ministry of Education and the Presidency of Ministry’s Council had the responsibility to lead the process, discussed the Strategy of DESD 2005-2014 and facilitated its linkage with different areas of the educational sector aiming social transformation. But this document didn’t show neither political or strategical, nor institutional implementation of sustainability in HEI. As far as universities are concerned, this group determined a follow up effect as to promote the interaction between multiple actors and institutions likewise the involvement of public administration institutions, investigation laboratories, non-governmental institutions, universities and mass media amongst others.

Notwithstanding some international drivers as mentioned, and a few practical examples at University level, preliminary results showed that ESD is still in its early stages of development and that there is a lack of national integrated strategies or policies. There haven’t been any plans or programmes at least integrated to let us conclude safely that it was quite intentional.

Further research is needed to continue in order to better understand how sustainability was integrated in the Higher Education Institutions (HEI) through governmental policies and strategies and within the Ministry of Education and Science in Portugal, through surveys and interviews with key actors that can also lead to other wider or not accessible plans, policies and programmes. Also, it will be important to analyse the plans, policies and strategies at HEI level as real implementation practices at those institutions.

6 Conclusions

From this paper we can draw some important conclusions:

a) Results between the Governmental Programmes and GPO content analysis for the same period of time did not seem to have produced any dramatic change even though the meanings of “sustainability” or “sustainable” had varied through time. Nevertheless, it

seemed clear that “sustainability” or “sustainable”, although more recent, is a far more adopted and accepted concept than before, even with other meanings.

b) When we studied the extent to which Ministry of Education and Science integrated “sustainability” in their plans, programmes and policies through the documentation that we had accessed to in the period 2005- 2014, “institutions”, “development “and “sustainable” appeared in the top 10 ranking of the most frequent words, not as part of a composite text but as individual words, and that suggested that even Education (and here we are talking about “Education for Development”) was a major issue but the implementation of ESD was not of a matter of major importance for the Ministry.

As more detailed studies must be undertaken, we ought to outline future prospects. Interviewing the key stakeholders in HE is what we considered absolutely mandatory to deepen our study. The methodology we used is described but we ought to move a step further through:

1. Interviewing key-actors concerning the implementation of sustainability in HEI through DESD 2005-2014 as from the Government side likewise Ministers, Secretaries of State, General Directors as from the non-governmental society;
2. Analyzing the plans, policies and strategies at HEI level, as well as interviewing the Rectors, and rest of the Rectoral Team, Responsible for Pedagogical and Scientific Councils of the HEI was another approach.

There is an absolute need for a change in the paradigm of Portuguese HEI and several barriers to overcome, both through learning and application of best practices from other European and worldwide countries. Due to the relatively small number and quality of the documentary sources we were able to gather, despite our efforts, this outlines the limitations of our work and some constraints of this paper. Adding this we also consider these sources as a sample and so they cannot be regarded as representative, but this can show the lack of commitment from the governmental institutions towards ESD. These are considered the main lessons of this paper.

CHAPTER 2

Education for sustainable development in Portuguese universities Institutional framework: the key actors' opinions

References: Farinha, C., Azeiteiro, U., Caeiro, S. (2018). Education for Sustainable Development in Portuguese Universities Institutional Framework: The key actors' opinion. *International Journal of Sustainability in Higher Education*, 19 (5), 912-941.

Available at: <https://doi.org/10.1108/IJSHE-09-2017-0168>

Abstract

Purpose – This study's aim is to determine, from key actors' perspective, how sustainability has been integrated into the policies and strategies of Higher Education Institutions (HEIs), particularly Portuguese public universities, within the framework of the United Nations Decade of Education for Sustainable Development (UN DESD) 2005-2014.

Design/methodology/approach – Semi-structured exploratory interviews were conducted, after gathering a sample of 15 key actors in decision-making processes who designed and implemented Portuguese Education for Sustainable Development (ESD). Seven interviews with the key actors were undertaken and analyzed, leading to other plans, policies and programmes that were not publicly accessible.

Findings – The main findings are the lack of commitment from Governmental institutions to implementing ESD at the university level and how few documents are partially linked to sustainable development, according to the key actors' opinions. Nevertheless, Portuguese universities' autonomy and their social responsibility have led them to develop several initiatives and policies towards ESD.

Limitations – Convenience sample does not allow results to be generalized to all Portuguese HEIs. Future investigation will be undertaken, including the analysis of plans, policies and strategies at university level and a questionnaire survey applied to those responsible for implementing sustainability in Portuguese universities.

Practical implications – This study provide findings, conclusions, and recommendations that ultimately motivate HEIs to achieve Sustainable Development (SD) and to be more effective integrating sustainability into their policies and strategies.

Originality/value – The paper contributes to the literature by reflecting the lack of integration of policies and strategies in HEIs in a Southern European country (Portugal), within the framework and goals of the UN DESD 2005-2014, and explaining similar patterns probably existing in other countries.

Keywords: *DESD – Decade for Education for Sustainable Development, Environment/Environmental, Key actors, Portuguese, Sustainability/Sustainable, Universities.*

1. Introduction²

It is a generally accepted view that universities have played a key role in transforming societies, by educating decision-makers, leaders and entrepreneurs. McCowan (2016: 505) also emphasizes that “(...) universities have been attributed a central role in the post-2015 development agenda and the achievement of the sustainable development goals”.

Karatzoglou (2013: 49) goes even further and, despite all that has been said, maintains:

“universities continue to cope effectively and sustainably with the dynamic nature of sustainability by displacing barriers, changing teaching paradigms, developing social competencies, communication skills, and community relations, and deepening their involvement in local and regional initiatives”.

Concerning international debate, Bizerril et al. (2018) mention the significant contributions to sustainability in HE (Higher Education), especially in the dimensions of education, research and assessment and reporting.

² See annexed data on this Chapter #2 in Appendices A and B.1.

The United Nations (UN) Decade of Education for Sustainable Development 2005-2014 (DESD) was a commitment implemented by member states according to their priorities and approaches (UNESCO, 2005). The engagement of Higher Education Institutions (HEIs) worldwide in sustainability increased due to the DESD and Wals (2014) exemplify this by simultaneously re-orienting their education, research, operations and community outreach activities. However, education and research on sustainability and inclusive development in universities is still at an early stage in many institutions, even in Europe, in particular in southern Europe. This is in line with, for example, Aleixo et al. (2016a) concluding that more than 50% of Portuguese HEIs are at this stage, classifying them as “laggards” and a “late majority” in implementing Sustainable Development (SD).

The results of Farinha et al. (2017), evaluating the incorporation of ESD at the policy and strategy level in public universities in Portugal and its implementation within the Ministry of Science, Technology and Higher Education, suggest that there was a lack of nationally integrated strategies or policies. This might have meant that the implementation of ESD at the time of the UN DESD was not a matter of major importance for the Portuguese Government or the Ministry of Science, Technology and Higher Education (MCTES).

These findings were obtained after analyzing all Governmental and ministerial plans and programmes produced during 2005-2014 and a few specific documents about ESD, which were found to contain a small number of references to ESD, and so there was a clear case to deepen the research. Nevertheless, there are some relevant international drivers, as well as a few good examples, at specific national universities that have already published their own Sustainable Reports (Farinha et al., 2017).

While the general focus of this paper is assessing how and to what extent sustainability has been implemented in public universities in Portugal, its specific aim is to determine, from key actors’ perspectives, how sustainability was integrated into the policies and strategies of HEIs, particularly in Portuguese public universities, within the framework and goals of DESD 2005-2014. This was done with semi-structured interviews that were conducted in a sample of 15 key actors of the Portuguese HEI decision-making processes.

The paper contributes to the literature by reflecting the lack of integration of national policies and strategies in HEIs in Southern European countries like Portugal, within the framework and goals of the UN DESD 2005-2014. Also, it attempts to understand how HEIs implement ESD without a top down approach, explaining similar patterns probably existing in other countries.

2. Literature review

2.1 Institutional background

Lozano et al. (2013) within DESD 2005-2014 period analyzed Declarations, Charters and Initiatives (DCI) for HEIs, which could be considered representative of university leaders' intentions to help improve the effectiveness of ESD. The authors proposed that for universities to become sustainability leaders and change drivers, they must ensure that the needs of present and future generations be better understood. For that the professionals who were well versed in SD could effectively educate students of "all ages" and help make the transition to "sustainable societal patterns".

After the DESD, in 2014, the Nagoya Declaration reaffirmed that the responsibility for ESD belonged to Ministries of Education and scientific and other knowledge communities, and they should enable HEIs to achieve the objectives set in Rio de Janeiro by supporting the realignment of economic, social, cultural, environmental and education goals (UNESCO, 2014).

The Declaration not only reaffirmed stakeholders' commitment over the previous ten year period, but also celebrated the achievements "(...) in putting ESD higher on national and international agendas, advancing policy, improving the conceptual understanding of ESD, and generating substantive good practice amongst a wide range of stakeholders" (UNESCO, 2014: 1).

It also opened the way for a set of follow-up initiatives, such as the commitment to build and launch the Global Action Programme (GAP) on ESD, and a concrete contribution to the post-2015 agenda that aims to generate and scale up ESD actions at all levels and areas of

education, training and learning. For that, five Priority Action Areas for ESD, through inclusive quality education and lifelong learning via formal, non-formal and informal settings, were defined (UNESCO, 2014).

Leal Filho (2015) wondered about the success of the of follow-up initiatives, as many of the problems that were seen during the UN DESD remained unsolved. The absence of formal commitments to sustainability in many universities and the lack of formal plans or strategies, which indicate the absence of a sense of direction concerning where a HEI may go, are some examples which prevent comparisons to assess progress. Leal Filho (2015: 1) calls this new age [post UN 2015] “Sustainability 2.0”.

Leal Filho et al. (2017) added that there are still numerous challenges to overcome namely:

(a) the need for HEIs to improve the integration of sustainability in the curriculum and in research, and

(b) the holistic integration in their systems, despite successful developments in the field of HESD over the past 15 years.

So, ESD commitments have not only been continued after 2014 but also reinforced by the United Nations Sustainable Development Goals (SDGs), namely “quality education” (SDG 4) (Beynaghi et al., 2016). This is in the outcome document Transforming our World: the 2030 Agenda for Sustainable Development (United Nations, 2018).

2.2 European universities: ESD implementation

Educational initiatives often appear after societal ones (Lozano et al., 2013); nevertheless, ESD reflects not only policy demands but also the transformation of the epistemological view in science and education (Dlouhá et al., 2013). As mentioned by Lozano et al. (2015), it is important to evaluate how European universities are integrating SD, because Europe is the oldest continent and has some of the most ancient universities in the world. Anand et al. (2015) consider SD a new way to see the world act and its integration into HE requires a profound cultural change rather than a technical shift. Pace (2016) criticizes ESD at HEI and

refers to the commitment to ESD, which is directly proportional to the political/legislative motivation to promote ESD, as one of the most successful features adopted by universities.

Table 2 Characteristics of ESD implementation, performance and evaluation in HEI in some European countries

Countries	Sweden	Wales	Belgium	Czech Republic	Poland	Spain	Portugal
Classification	Northern country	Western country	Northwestern country	Central and eastern country	Central and eastern country	Southern country	Southern country
Centralized system concerning sustainability implementation in HEI (Yes/No)	Yes (1996 requirement that all Swedish public authorities (including universities) were made responsible for contributing to the sustainable development of the society) (Lotz-Sisitka, 2004)	Yes (there is the Higher Education Funding Council for Wales) (Glover & Peters, 2013)	DK (Verhulst & Lambrechts, 2014)	Yes (Dlouhá et al., 2016)	Yes (depend on the country's policies set by the MSTHE that shapes the framework of the curricula and supervises the State Accreditation Council) (Koscielniak, 2014)	Yes (the Spanish government developed the 2015 University Strategy to adapt Spanish universities to the guidelines proposed by the European Higher Education Area) (Lárran Jorge et al., 2016)	No (Farinha et al., 2017)
ESD implementation in HEI	(Slow) Transformation of HE towards sustainability (Dlouhá et al., 2016)	Top down actions concerning plans and strategies (Glover & Peters, 2013)	In University college Katholieke Hogeschool Leuven (case study) there was a mixed ESD implementation in a 4 stages process (Verhulst & Lambrechts, 2014)	ESD applied in the institutional frameworks of certain HEI due to Research groups in charge of curricula and educational and pedagogical tools (Dlouhá & Burandt, 2015)	Sustainable movement has not yet occurred in HEI (Koscielniak, 2014)	The Committee of Rectors of the Spanish Universities (CRE) approved in 2002 the creation of a "Working Group on Environmental Quality and Sustainable Development" in the Spanish Universities. This Group had issued a set of guidelines to incorporate sustainability into the curricula (Alba and Blanco, 2008). Moreover, the Spanish government developed the 2015 University Strategy to adapt Spanish universities to the guidelines proposed by the European Higher Education Area (Lárran Jorge et al., 2014)	It hasn't yet entered in HEI's system and activities (Aleixo et al., 2017 a)
ESD performance, considering evidence of progress on ESD in HE	Best performance (Dlouhá et al., 2016)	Best performance (Dlouhá et al., 2016)	The bottom-up approach successfully connected with a top-down approach (Verhulst & Lambrechts, 2014)	Continuation of noticeable absence of research and documented evidence (Dlouhá et al., 2016)		Few (Lárran Jorge et al., 2016)	Few (Bizenil et al., 2018), (Aleixo et al., 2016, 2017 a, b), (Shiel et al., 2016)
Integrated studies to evaluate how ESD has been applied in the institutional frameworks of HEI	Yes (Dlouhá et al., 2016)	DK (Dlouhá et al., 2016)	DK (Verhulst & Lambrechts, 2014)	Yes (Dlouhá et al., 2016)	DK (Dlouhá et al., 2016)	Few (Lárran Jorge et al., 2016, 2014), (David & Blanco, 2008)	Few (Bizenil et al., 2018), (Aleixo et al., 2016, 2017 a, b), (Farinha et al., 2017)

Table 2 highlights the differences between Northern/Western European countries and Central and Eastern European countries, considering the different approaches to implementing ESD at HEI and the studies that have been conducted to evaluate the implementation of sustainability. It seems that there are different speed situations and a substantial difference when comparing Southern to Northern or Western European countries.

The Northern and Western European countries, like Sweden and Wales have a “best performance” rating for evidence of progress on ESD in HEI.

The Swedish and Welsh examples (Top performance) are two centralized systems showing how sustainability can be implemented in universities. After 1996, all Swedish public authorities (including universities) were made responsible for contributing to the sustainable development of society (Lotz-Sisitka, 2004). Evaluation of the application of ESD in the HEI framework illustrates that, in Sweden, fostering transformation in HE towards sustainability was a slow process, but possible (Dlouhá et al., 2017). In the case of Wales, there were top-down actions or cascade processes concerning plans and strategies

to implement ESD in HEI, as the Higher Education Funding Council for Wales adopted the Capability Maturity Model. So, the adherence to Government priorities in strategic plans is aligned with strong leadership (Glover & Peters, 2013).

Verhulst & Lambrechts (2015) studied the integration of SD in the Belgian University College Katholieke Hogeschool Leuven from the perspective of organizational change management, with a focus on human factors. They concluded that, in the ten-year period of 2003-2013, this HEI followed four stages concerning SD integration. The bottom-up approach successfully connected with a top-down approach.

This case study showed a mixed implementation of ESD in a single university but could represent a good example of what is being done in this European country.

There is a noticeable lack of research and documented evidence, especially in the post socialist states of Central and Eastern Europe, namely Czech Republic and Poland (Dlouhá et al., 2017).

Despite having the same system for sustainability intervention, Czech Republic and Poland implement SD differently in their universities. In the former country, ESD has been applied in the institutional frameworks of some HEI, due to important research groups in charge of curricula and educational and pedagogical tools (Dlouhá & Burandt, 2015), but in the latter, the sustainable movement has not yet occurred in HEI (Kościelniak , 2014). In both cases, as referred by Dlouhá et al. (2017), there seems to be a lack of research and documented evidence. Movement towards SD does not exist in Polish universities due to the absence of a serious discussion about the role of sustainability in HEI, and the reason might be that sustainable strategy for higher education is not a priority for the Government, or for those in charge of HE policy (Kościelniak , 2014). Nevertheless, the implementation of SD is recommended to be included in an act of law through 'top down' actions.

Among Southern European countries (see Table 2), Spain and Portugal, despite having similar systems, have implemented ESD in different ways.

Alba & Blanco (2008) mention that, in Spain in 2002, the Committee of Rectors of the Spanish Universities (CRUE) approved the creation of a "Working Group on Environmental Quality and Sustainable Development" in Spanish universities. This group issued a set of

guidelines to incorporate sustainability into the curricula. Moreover, the Spanish Government developed the 2015 University Strategy to adapt universities to the guidelines proposed by the European Higher Education Area (Lárran Jorge et al., 2014). So, on this basis, the Spanish Government has drawn up two documents to stimulate the debate on the concepts of university governance and accountability. Later Lárran Jorge et al. (2016: 968) stated that “(...) focusing on research, few studies to date have been undertaken to determine the extent to which universities are incorporating practices on sustainability”.

The Portuguese Government promoted the effective institutional autonomy of universities (Heitor & Horta, 2016) and there is no centralized system for implementing ESD (Farinha et al., 2017). According to Aleixo et al. (2017a), even though SD is recognized as being very important to HEIs and society, it has not yet entered HEIs’ systems and activities. Nevertheless, Shiel et al. (2016) state that Portugal has lagged behind other European countries in externally oriented activities aimed at building capacity within local communities to promote SD in the dimension of “outreach”.

Notwithstanding those earlier studies, it is important to understand, how HEIs in Southern European countries, like Portugal, are implementing ESD and why the progress is being so slow. In Portugal, there is no centralized system for ESD implementation, including specific policies and strategies, but public universities have strong autonomy from the Government. So, gathering key actors’ opinions can help to understand at what level sustainability is being implemented in HEI and what the main barriers to its application are. This study, conducted in a European country, can help to understand why ESD may be applied or not in the institutional strategies of HEIs in several countries, and what lessons can be learned.

3. Methods

3.1 Nature of the study and interview questions

This exploratory study follows a qualitative approach with semi-structured interviews (Bryman, 2012), that were conducted after gathering a sample of 15 key actors in decision-making processes.

In earlier studies (Farinha et al., 2017), references to ESD were scarce in Governmental plans, policies and programmes in Portugal; specific documents about ESD at the Higher Education level were non-existent. So, these interviews were intended to provide a better understanding of the compromises concerning ESD in Portuguese public universities, as well as the possible ways of implementing the DESD goal and their impact on strategies and actions. The interviews with key actors aimed:

- (a) to confirm the earlier findings;
- (b) to point out other hidden or not publicly accessible plans, policies and programmes;
- (c) to provide insights into the barriers for implementing ESD at public universities.

The interview script (with research questions) used in the study is shown in Appendix B.1. The questions were selected by the researchers' unmet needs when analyzing Governmental and Ministerial documentation namely plans, programmes and policies that weren't accessible in the period 2005-2014 (Farinha et al., 2017) and where questions were still needing to be addressed.

3.2 Sample

A convenience sample was used and the access to the individuals was institutionally scheduled, namely:

- (a) Science, Technology and Higher Education Ministers, as well as the Ministry's General Secretary and the General Director of Higher Education;

(b) Chairpersons of the Portuguese University Rectors Council (CRUP), representing Portuguese University Chancellors;

(c) HEIs and key non-Governmental persons with influence in so-called civil society, considering their involvement, no matter the nature, intensity or their leadership in the period of the DESD 2005-2014.

This selection corresponds to 15 key actors.

Second, this sample received relevant input from an expert key actor and facilitator, who not only helped in compiling the list but also played a major role as a facilitator to 9 out of the 15 key actors, by explaining beforehand the importance of this study, inviting them to collaborate and participate in it.

Of the key actors from Governmental or ministerial areas, only 2 out of 6 were not able to collaborate, and one of them was the Minister of Science, Technology and Higher Education, whose importance came from the past, as he had been Secretary of State for Science, Technology and Higher Education under the previous and late Minister, from 2005 to 2011.

Seven answers or respondents' opinions were then obtained. The response rate from this group of key actors cannot be compared between themselves, due to the difficulty of getting in touch with an increased number of interviewees, and so the response rate diminishes in a proportionally inverse order as the hierarchical degree of the interviewee increases (see Table 3 below).

Table 3 Sample: initial and final

	Final sample	Institution name	Key actor role in the Institution	Timeline	Classification	#
Initial Sample	Min_1	Ministry of Science, Technology and higher Education	General Secretary	2006 until present time	Ministry	1
	Min_2	General Direction of Higher Education	General Director of Higher Education	2004 to 2012		2
		Ministry of Science, Technology and higher Education	Minister; previously the Minister's Mariano Gago Secretary of State for the Higher Education	2015 until present time; 2005-2011 and 2015 until present time		3
		Ministry of Science, Technology and higher Education	Minister of Science and Higher Education Minister	2002-2003		4
		Ministry of Science, Technology and higher Education	Secretary of State of Higher Education	2013-2015		5
		Ministry of Science, Technology and higher Education	Secretary of State of Higher Education	2011-2013		6
		Portuguese University Rectors Council	Chairperson of the Portuguese University Rectors Council (CRUP)	2014 until present time	PURC	7
		Portuguese University Rectors Council	Chairperson of the Portuguese University Rectors Council (CRUP)	2010-2014		8
	X_1	Portuguese University Rectors Council	Chairperson of the Portuguese University Rectors Council (CRUP)	2007-2010		9
		Portuguese University Rectors Council	Chairperson of the Portuguese University Rectors Council (CRUP)	2005-2007		10
		UNESCO National Commission Forum – Portugal	Coordinator of "UNESCO National Commission Forum-DESD (2005-2014): Contributions for its dinamization in Portugal (2006)"	2006	Civil society	11
	X_2	University of Lisbon among multiple other activities	Representative of non-governmental organizations in the environmental area in UNESCO National Commission; He was a delegate of the portuguese delegation to the Sustainable Development Conference in Joanesburgo (2002). In the 1st semester of 2004, he was invited by the Prime Minister, to integrate a Working Team in charge of the elaboration of the National Strategy of Sustainable Development (ENDS) and its Implementation Plan (PIENDS). Simultaneous, he is a member of the Scientific Council of the portuguese edition of the National Geographic, among many other roles, conferring him an important role in the civil society	1992 until present time		12
	HEI_1	University of Coimbra	Vice-Rector of Coimbra University between 2003 and 2011, where was responsible for Administrative management, Financial management, Human Resources, Academic Management and Scientific Investigation, supervising Communication and Information Technologies (CIT), libraries and institutional planning. He was responsible for 2 administrative organizations in Coimbra University between 2003 and 2010 and last, but not the least, Director of the Interdisciplinary Investigation Institute in the University (3III)	2003-2011	HEI	13
	HEI_2	University of Coimbra	Diretor of Building Management Service, Security and Environment (GESA) as Administrator in University of Coimbra	2002-2011		14
	HEI_3	University of Coimbra	Responsible for the rehabilitation and safety in the Rectorate of Coimbra University from 1999, being Pro Rector since, coordinating, among other activities, the Pluriannual Programme Contract for the maintenance and conservation of Historical Buildings	1999-2006		15

The names of the interviewees were not disclosed; the notation below was used for classification and reference:

- Governmental and ministerial key actors: Min_1 and Min_2;

- CRUP and civil society key actors: X_1 and X_2, since there was only one answer from each and the aim was not to disclaim their names;
- HEI key actors: HEI_1, HEI_2 and HEI_3.

3.3 Data collection

Interviews were conducted between October 1, 2016 and December 2, 2016. All of them were audio recorded and transcribed with the permission of the participants.

The preferred mode of interview was face-to-face, in a comfortable place determined by the respondents. When that was not possible, the meeting was conducted by Skype.

Each interview lasted on average 58 minutes (ranging from 43 minutes to 1 hour and 23 minutes) and I insisted 1 to 6 times to get an interview (namely in the case of General Secretary of the Ministry of Science, Technology and Higher Education) (see Table 4).

Table 4 Interview process (date, mode, duration and number of requests) of the final sample

Final sample	Institution name	Timeline	Classification as Key actor	Date of Interview	Interview mode	Interview Duration	number of requests
HEI_1	University of Coimbra	1999-2006	HEI	1-out-16	face-to-face	01:23:21	2
X_3	Portuguese University Rectors Council (CRUP)	2007-2010	CRUP	7-out-16	skype	0:52:09	2
Min_1	Ministry of Science, Technology and Higher Education	2006 until present time	Ministry	10-out-16	face-to-face	0:43:06	6
HEI_2	University of Coimbra	2002-2011	HEI	21-out-16	face-to-face	01:03:05	6
X_4	University of Lisbon among multiple other activities	1992 until present time	Civil Society	18-nov-16	skype	0:47:26	3
Min_2	General Direction of Higher Education	2004-2012	Ministry	18-nov-16	telephone	0:43:09	6
HEI_3	University of Coimbra	2003-2011	HEI	2-dez-16	skype	01:14:53	1

3.4 Data treatment

The data was collected through semi-structured interviews, treated and analyzed in a coding system, according to a qualitative approach. This was developed considering the selection of terms and/or mixed terms that were gathered after a content analysis and systematic review, as described by Farinha et al. (2017). In this system, a node was designated a priori code. Other nodes were built on the themes (such as Government, Ministry, CRUP, universities, DESD 2005-2014 and implementation) within the interview script, applied in the review and the priori categories were built on the research questions using a detailed content analysis methodology (Bardin, 1977). This coding technique was used to analyze the interviews, as coding is a process to generate categories and this started by using descriptive coding where phrases, words, and sentences from interview transcripts were labelled using relevant words or phrases (Saunders et al., 2009).

To obtain an organized codebook, as often as each interview was revised, the code was adjusted, which consisted of classifying the information disclosed in different categories. Both priori nodes and subsequent nodes suffered enough changes to be properly called posteriori nodes. This was an interactive process, based upon multiple hearings and analyses of the audio interviews, in which at least 14 changes were made to some of the items (Saunders et al, 2009: 494).

NVivo (version 11) software was used for the qualitative content analysis and the quantitative aspects were treated by descriptive analysis. The limitations associated with similar surveys, such as restricted validity, reliability and generalizability of the results, as well as those associated with participant and observer error and bias (Saunders et al., 2009) were considered in the discussion of results, and when drawing conclusions.

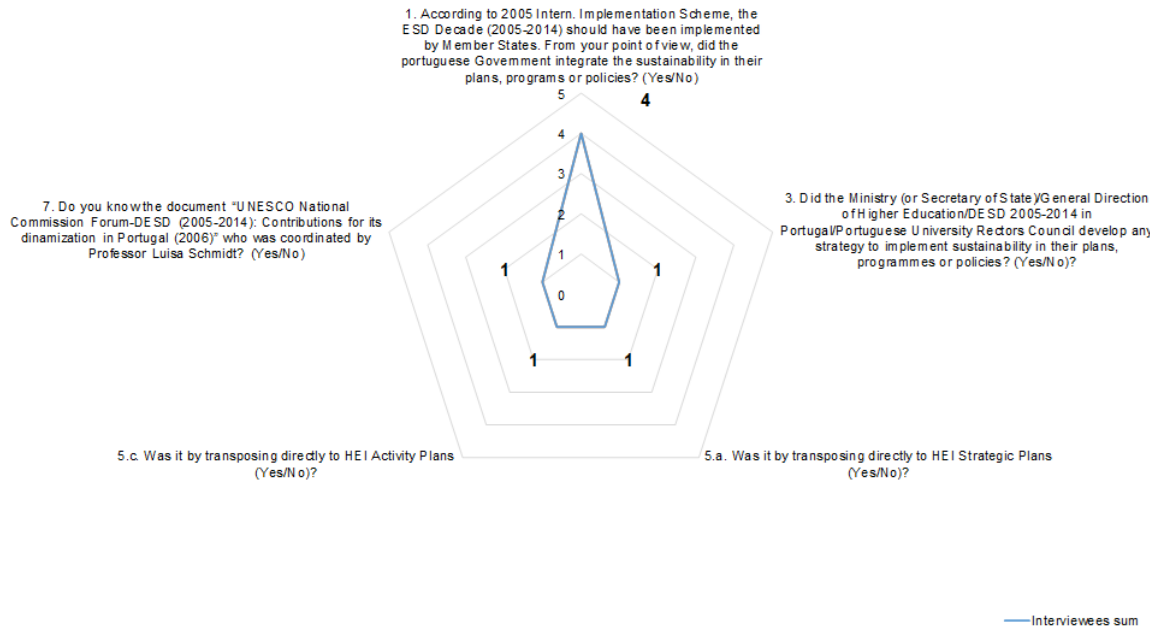
4. Results, findings and discussion

4.1 Global approach

“Yes” and “No” responses to the research questions (questions 1, 3, 5a, 5c, and 7; Appendix B.1) were analyzed to understand where the interviewees stand in terms of the

Government's and the Ministry's implementation of sustainability plans, programmes or policies in public universities.

Figure 7 Affirmative results of the interviewees on the research questions “Yes or No”



The results (see Figure 7 and Table 4) showed that four of the seven interviewees said that the Portuguese Government had integrated sustainability in their plans, programmes or policies in universities, regarding the International Implementation Scheme UN DESD 2005-2014. However, only one of the seven key actors mentioned that either the Ministry, CRUP, or DESD 2005-2014 Coordination had developed a strategy to implement sustainability at universities:

Since 2002 the Portuguese Government led by António Guterres and his Environmental Minister, José Socrates, tried to follow United Nations orientations i.e. sustainability, which meant going from the National Environment Plans (in vogue in the 1980s) to the Sustainability Plans, that started in the Netherlands (X₂).³

³ The transcriptions of stakeholders' open answers were translated from Portuguese to English for this manuscript.

Table 5 Number of affirmative answers (“yes”) to each of the research questions

Thematics	Governmental Implementation	Ministry / DESD 2005-2014 Portugal / Portuguese University Rectors Council Implementation	HEI Implementation		UNESCO National Commission Forum-DESD (2005-2014): Contributions for its dynamization in Portugal (2006)
Research questions	1. According to 2005 International Implementation Scheme the Education for Sustainable Development Decade (2005-2014) should have been implemented by Member States. From your point of view, did the Portuguese Government integrate the sustainability in their plans, programs or policies? (Yes/No)	3. Did the Ministry (or Secretary of State)/General Direction of Higher Education/DESD 2005-2014 in Portugal/Portuguese University Rectors Council develop any strategy to implement sustainability in their plans, programmes or policies? (Yes/No)?	5.a. Was it by transposing directly to HEI Strategic Plans (Yes/No)?	5.c. Was it by transposing directly to HEI Activity Plans (Yes/No)?	7. Do you know the document “UNESCO National Commission Forum-DESD (2005-2014): Contributions for its dynamization in Portugal (2006)”, who was coordinated by Professor Luisa Schmidt? (Yes/No)?
Number “Yes”	4	1	1	1	1
Number “DK”	2	3	0	0	0

DK - “Doesn’t know”/“doesn’t want to answer”

No key actor who answered “yes” could explain clearly how the Portuguese Government integrated sustainability into their plans, programmes or policies for universities, regarding the International Implementation Scheme UN DESD 2005-2014.

Two and three of the seven interviewees’ answers were classified as “does not know” or “does not want to answer”, due to their refusal to choose a dichotomic answer (Yes or No) on whether the Government on the one hand or, on the other hand, the Ministry, the DESD 2005-2014 Coordination or CRUP had implemented ESD (see Table 5).

When the key actors were asked about transposing sustainability directly to HEI strategic or activity plans (see Table 5 and Figure 7): only 1 person out of seven confirmed this implementation.

Only one interviewee knew of the existence of the document UNESCO National Commission Forum-DESD (2005-2014): Contributions for its dynamization in Portugal (2006).

4.2 The Government’s and Ministry’s role

When crossing the nodes “players engaged with Government’s action” to the nodes “public policies and strategies in sustainability implementation through DESD 2005-2014” a matrix node was obtained. The node “players” was obtained through key actors’ answers to questions 2 (Who were the intervenient in the sustainability implementation process in the Governmental plans, programmes or policies?) and 4 (Who were the intervenient in the sustainability implementation process at the Ministry (or Secretary of State)/General Directorate of Higher Education/DESD 2005-2014 in Portugal/CRUP?) (Appendix B.1).

The “players” are the entities involved in implementing of public or Governmental policies and strategies on sustainability.

The public policies or strategies most referenced by the key actors in the sustainability implementation through DESD 2005-2014 were, by descending order:

- National Strategy for Sustainable Development (ENDS 2007),
- National Action Plan for Energy Efficiency (PNEE),
- National Action Plan for Renewable Energy (PNER).

When crossing these with the entities involved in public or Governmental policies and strategies, the results showed that almost two-thirds are attributed to the Ministries of Environment, Education (specially ENDS 2007 and PNEE) and Economy, the Mission Unit and the National Council for the Environment and Sustainable Development (CNADS) (these last two, mostly attributed to ENDS 2007).

For HEI_1, the intervenients in the sustainability implementation process in the Governmental plans, programmes or policies were the Ministers of the Environment and Economy, General Secretaries, the General Secretary of Energy and Geology. However, HEI_1 did not recall their names since importance at the time was given to the person responsible for the PNEE and PNER.

According to X_2, the Government’s role involved the 3 Ministries (Education, Economy and Environment):

Portugal had its Sustainability Plan in 1995, designed by the person who some years after was indicated to assume the Ministry of Environment and became afterwards Prime Minister (from 2005 to 2009 and 2009 to 2011). Nevertheless, it had never been implemented (X_2).

The Portuguese Prime Minister (1999-2002) did not give as much credit to Sustainability Plans as to Sustainable Development Strategies, so Portugal only had its first National Strategy for Sustainable Development in 2007. The then Minister of the Environment drafted it, in X_2’s opinion.

It seems that, in the early days of the XVII Constitutional Government (from 2005 to 2009), the issues related to sustainability were not clear.

In the third quarter of the XV Constitutional Government (from 2002 to 2004), the Prime Minister invited key actor X_2 (as he was part of CNADS) to be part of the Expert Multidisciplinary Technical Working Group (a group “outside” the Government) to design the National Strategy for SD.

The Expert Multidisciplinary Technical Working Group integrated a group of people from different areas, including Education, Environment and Economy, and the rationale was that there would be a Mission Unit for Sustainable Development (UMSD) from 1st January 2015 onwards.

For X_2 there were some key success factors for the implementation of the National Strategy for Sustainable Development 2005/2015: a project for Portugal:

- (a) The Prime Minister’s leadership (during the period from 2002 to 2004) when he took the initiative to “enlighten” (author’s word) the Mission Unit, though that wasn’t created to make a living strategy produced by the Working Group to implement the Education for Sustainable Development (through DESD 2005-2014);
- (b) The interministerial collaboration with the Program Manager of different Ministers’ Experts;
- (c) A strategy designed to be approved by Parliament by deliberation, and not by the Government (e.g., by a Resolution of the Council of Ministers);
- (d) The “lightness” of the human resources team (a mere six full time staff);
- (e) The goal (which did not happen) of creating the Mission Unit simultaneously with the DESD 2005-2014, led by the Prime Minister;
- (f) Both monitoring and assessment should be carried out by CNADS and the Social and Economic Council (CES).

The leadership commitment is indeed very important for ESD implementation, as pointed out by Lozano et al. (2015).

But there was a drawback to the strategy; after the document had been delivered to the Prime Minister, in June 2004, he left the Government to lead the European Commission and a new Prime Minister was appointed. Because of the change in Government, the succeeding Prime Minister did not give priority to the project, and “so it died” (X_2).

Meanwhile the document “National Strategy for Sustainable Development 2005/2015: a project for Portugal” that the Expert Multidisciplinary Technical Working Group had been working on was published by a private editor (Mota et al., 2005).

On this issue, respondent Min_2 gave a complimentary opinion of the Government’s role:

The actual Technology and Science Foundation President was the Coordinator of Programme MIT (Massachusetts Institute of Technology) / Portugal and responsible for its interface with Universities in Portugal in 2007. This program had a “Sustainable Economy component” and involved three public HEIs in Portugal: Oporto, Coimbra and Lisbon. In this case, there was an intervention by central administration to harmonize the curricula in the doctoral programme. This was the most direct Governmental intervention; apart from this, there wasn’t great Government involvement in Sustainable Development.

The MIT/Portugal Program was launched, in 2007, in partnership with the University of Texas at Austin, and later extended its operations to other strategic partnerships with the Massachusetts Institute of Technology (MIT), Carnegie Mellon University (CMU) and the Fraunhofer-Gesellschaft. The novelty of this approach (Heitor & Horta, 2016: 162) in Portugal is that it

“[...] focused on the process of developing a system of competence building driving innovation and the diffusion of knowledge through the economic appropriation of the results and methods of science by society oriented to global markets”,

The government did not have a role in implementing HEIs’ sustainability policies and strategies. It might have had if maybe, and just if the political conditions had stayed the same as they were in June 2004 (according to X_2’s opinion).

Nevertheless, there was a sequel. The document National Strategy for Sustainable Development 2005/2015: a project for Portugal (Mota et al., 2005) was published, although its guidelines did not go through as a strategy, due to a change in government. Here, it was not only about the government itself but the leadership commitment. This happened before the public announcement of Sustainable Development National Strategy 2007, in the XVII Constitutional Government (according to X_2's opinion).

4.3 Ministry of Science, Technology and Higher Education's role (MCTES)

Only one interviewee out of the seven stated that the Ministry of Science, Technology and Higher Education had developed a strategy to implement sustainability in their plans, programmes or policies⁴ (Min_1, see Table 2)

Our role was mainly to be the intermediary between ADENE [National Agency for Energy] and the great energy consumers classified by ADENE. Here we are referring to public HEIs, like "Instituto Superior Técnico", University of "Trás os Montes e Alto Douro", Polytechnic Institute of Guarda, Polytechnic Institute of Setubal, ISCTE - Lisbon University Institute, Sciences and Technology Faculty from Nova University of Lisbon.

ADENE⁵ via Eco.AP (the programme to promote energy efficiency in the public administration) applied to universities, which are great energy consumers. Therefore, the Ministry was charged with assessing and implementing measures to improve energy efficiency.

On the other hand, Min_2 mentioned that:

"The universities were given liberty to present their formal programme proposals, namely their course openings, in the University General Application Procedure.

⁴ Question 3: *Did the Ministry/DESD 2005-2014 in Portugal/CRUP develop any strategy to implement sustainability in their plans, programmes or policies (Yes/No)?*

⁵ ADENE is the National Agency for Energy (ADENE - National Agency for Energy, 2017).

Also, one of the interviewees (HEI_3) stated that:

I didn't know which the strategies were, if there were any, however I emphasize the Rectoral teams' role. They were very proactive even before 2005, and I believe that they didn't have any top down orders. And I quote this small example: in 1995 a newly built school in Valongo do Vouga, in Águeda, had already developed a sustainability project related to lighting (10 years before).

The result "does not know" to question 32 (see Table 5), as well as the same number for negative answers, suggest that the sustainability implementation process might not have been carried out through ministerial plans, programmes or policies.

HEI_1 stated in his interview that:

Neither the Ministry, Coordination of 2005-2014 nor CRUP integrated sustainability or gave any orientations to implement it in their plans, programmes or policies.

Nevertheless, the Portuguese Government had apparently integrated the UN DESD (2005-2014) into their plans, programmes or policies, according to the 2005 International Implementation Scheme (at least in four out of seven interviewees' opinion, see Table 5).

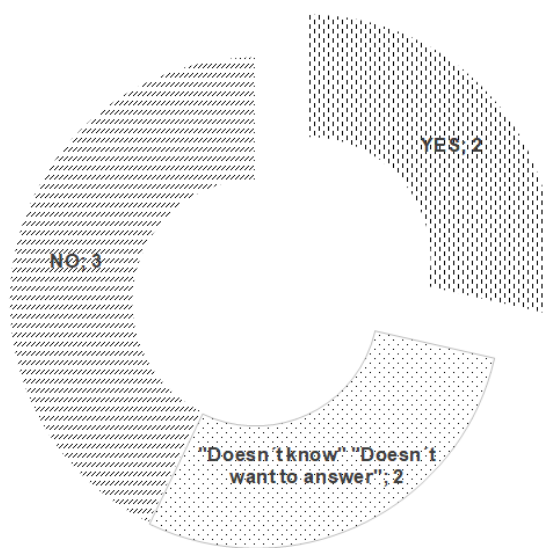
4.4 Portuguese University Rectors Council (CRUP)

In X_1's opinion, the rectors and vice rectors of Oporto, Minho and Aveiro Universities were very involved in the sustainability implementation process. In Lisbon, the Technical University of Lisbon, the University of Lisbon and the New University of Lisbon also had important roles. HEI_2's opinion is:

The Rectoral teams were not very important regarding the environmental and sustainability thematic but in CRUP's case, a rector from New University of Lisbon that was also in charge of CRUP leadership, was very proactive.

Only two out of seven interviewees said that CRUP had developed strategies to integrate sustainability into their plans, programmes or policies for Universities (question 3⁶, Figure 8).

Figure 8 Key actors' distribution of frequencies about Portuguese University Rectors Council (PURC) development of strategies to implement sustainability in their plans, programmes or policies' through DESD 2005-2014



One of the interviewees (X_2) did not believe in CRUP's intervention and mentioned that:

It was a very passive entity as it has never had "an epiphany". The Ministry of Environment was the best equipped Ministry to launch the process and the Mission Unit had had this purpose: to act as a cross -Government task force and to be respected. Sustainable Development was a unified strategy and not an environmental specific area, but unfortunately the Ministry of Environment was more passive than active.

4.5 *The public universities role*

The only interviewee who clearly gave an affirmative answer (see Figure 7 concerning "whether universities integrated the sustainability implementation process into plans,

⁶ See note 4 above.

programmes and policies from the Ministry” explained that “universities did it as they were obliged to” (HEI_1). Nevertheless, he did not explain how they did it (questions 5, 5a and 5b, Appendix B.1).

Respondent HEI_2 said that:

At a certain moment, I felt there had been a lack of an integrating document or an exciting aggregator, one that made us all understand what it meant.

Since the University of Coimbra had already been certified by ISO 9001 (quality certification), HEI_3 considered that the sustainability implementation process had been indirectly transposed to the university’s strategic plans, in their plans, programmes and policies from the Ministry.

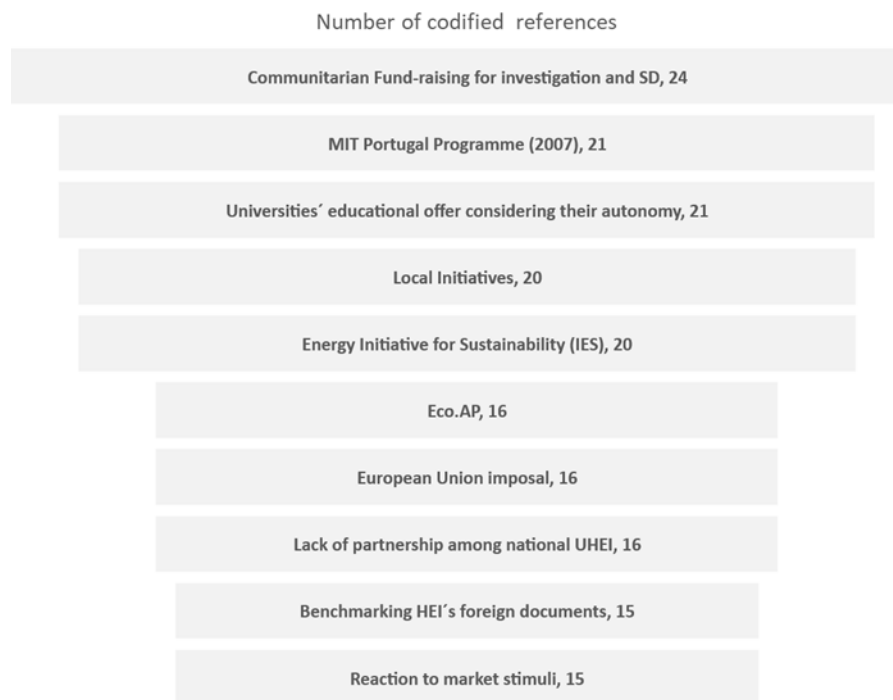
There are challenges to the universities in the Education for Sustainability and Education for Environmental fields, according to X_1:

Post graduate programmes to give sequence to the primary and secondary school preparation; Disseminate transdisciplinary training of environmental areas on a compulsory basis, and so to exemplify, I quote environmental law, environmental geography to have citizens environmentally smart or awaken for sustainability. This is Universities’ role; Alert to the launch of projects on the environmental sustainability investigation area.

There are multiple forms of sustainability implementation in public universities regarding the number of codified references highlighted by the respondents⁷, as shown in Figure 9.

⁷ Questions 5a, 5b, 5c, 5d, 5f, 5e, 5f, 5g and 5h (*Did Public HEI integrate the sustainability implementation process from the ministry in their plans, programmes or policies (Yes/No?)*). What are the possible forms of sustainability implementation?

Figure 9 TOP 10 Forms of sustainability implementation in public Universities regarding the number of codified references (no mutually exclusive) according to key actors 'opinion



In the specific MIT's case rephrasing Min_2:

The Universities were chosen in 2007 and for that there was financial support that led the investigation and the opening of new subjects.

4.6 Documents and/or important/relevant information in the sustainability implementation process through Governmental and ministerial plans, programmes or policies

The document UNESCO National Commission Forum-DESD (2005-2014): Contributions for its dynamization in Portugal (2006)⁸ was not often mentioned by key actors in the open questions, except when they were asked about it directly in a dichotomic question (see Figure 7).

⁸ Question 7: Do you know the document "UNESCO National Commission Forum-DESD (2005-2014): Contributions for its dynamization in Portugal (2006) which was coordinated by Professor Luisa Schmidt (Yes/No)?".

As the University is up-to-date concerning legislation and incentives for environmental, safety and building policies, we had no pressure from the Government. Nevertheless, there weren't any strategical documents at least with an innovative characteristic to let universities make any other options (HEI_2).

From interviewee X_1's point of view:

There were no such thing as top down policies and university autonomy has been misinterpreted as the universities must solve their own problems.

On the one hand for interviewees Min_2 and HEI_3:

The sustainability integration policy was done by the universities as there wasn't great Government involvement in SD area (Min_2).

The document Law no. 62/2007, 10th September - Legal status of tertiary education institutions is the reference document regarding the sustainability implementation process through Governmental plans, programmes or policies without further explanation (HEI_3).

On the other hand, HEI_1 considered that:

The Member State was obliged to do so and so the Portuguese Government integrated sustainability in their plans, programmes or policies according to 2005 international implementation scheme the ESD Decade 2005-2014. The European Commission demanded 2 documents (2 action plans): National Action Plan for Energetic Efficiency (PNEE) and National Action Plan for Renewable Energies (PNER) and these two were the main sustainability policies. The Government presented them well but how was it implemented? That is another thing.

The documents or the information that were mentioned by key actors⁹ were organized hierarchically (Governmental to HEI), according to the number of codified references:

- (a) University General Application Procedure (DGES - Higher Education General Direction, 2017);
- (b) Energy Initiative for Sustainability (IES), that is an initiative of Universidade de

⁹ Questions 1b and 3b (*Which are the documents? Applied to Governmental and ministerial sustainability implementation*).

Coimbra (Universidade de Coimbra (UC), 2011);

(c) Energy Efficiency Programme in the Public Administration (Eco.AP), whose main goal was to reduce energy consumptions in HEIs (Republic Assembly, 2011);

(d) National Action Plan for Energy Efficiency (PNEE) (Republic Assembly, 2008), where there is no status for ESD, even though it is mentioned:

A programme called [Energy in Schools] will take place and, in this perspective, the education role in individuals changing behavior and so the proposal is to implement an information and awareness campaign targeted at schools (boards, professors, students, families, communities socially and territorially speaking), and youth of school age. [...] The main message was [Give credit to your effort: your energy is our energy];

(e) National Action Plan for Renewable Energies (PNER) (Republic Assembly, 2010): ESD and SD were not mentioned at all;

(f) Number of approved candidates in the 1st phase of University General Application Procedure (DGES - Higher Education General Directorate, 2017);

(g) CRUP Principles' Act, whose main concern is the Higher Education Reform (CRUP, 2007);

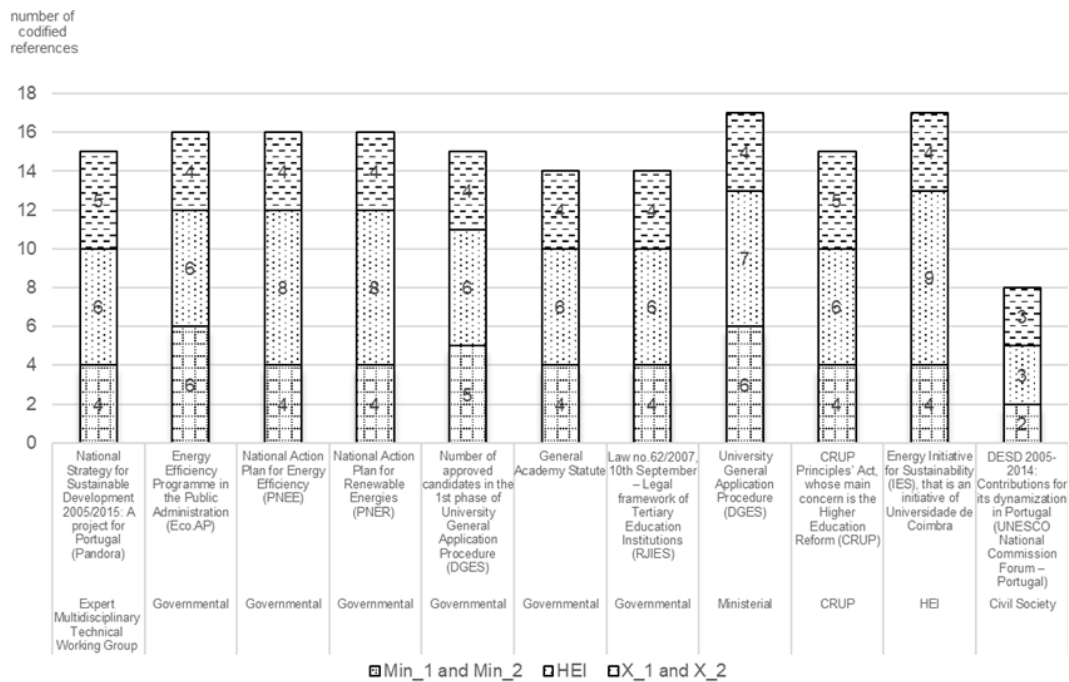
(h) National Strategy for Sustainable Development 2005/2015: a project for Portugal (Mota et al., 2015);

(i) General Academy Statute (General Academy Statute, 2010), whose focus is on professors from universities, among other institutions which may be called HEI;

(j) Law no.62/2007, 10th September – Legal framework of Higher Education Institutions (RJIES) (Republic Assembly, 2007);

(k) DESD 2005-2014: Contributions for its dynamization in Portugal (UNESCO National Commission Forum – Portugal, 2006).

Figure 10 Number of codified references in the documents organized by their name and type as well as by key actor classification (obtained from the answers to questions 1b and 3b)



Although mentioning these documents, the interviewees believe that neither the Government, the Ministry, nor the CRUP integrated sustainability in their plans, programmes or policies. Documents (b) and (c) do not refer in any way to sustainability implementation in public university HEIs.

It seems that not only did the universities have no top down policy in terms of SD and one of the interviewees from the Ministry admits it (“[...] there wasn’t great Government involvement in Sustainable Development” (Min_2)) but “there were also no such thing as top down policies as the universities must solve their own problems” (X_1).

4.7 Impacts of DESD 2005-2014 on Portuguese society

Three of the key actors agree that DESD 2005-2014 had an impact on Portuguese society¹⁰ compared to 2 that think that DESD had no impact, or the other 2 that did not know or did not want to answer this question.

On the one hand, Min_2 said that:

DESD 2005-2014 had an impact on Portuguese society through the dissemination of problems and solutions in primary, secondary school systems and in the university system. He emphasized also the expression “lifelong learning”.

On the other hand, X_1 considered that DESD did not have a great impact on Portuguese society:

At the primary and on the secondary levels, sustainability had an impact before DESD. In the universities’ case, DESD’s impacts happened for their initiative to respond to society’s demand and not to the Government’s demand. And to accomplish that, universities created formal programmes to react to the market stimuli. They should exist even if there are no students. The programmes were created as they had resounding names in the environmental case, and I quote New University of Lisbon and University of Aveiro.

5. Discussion

According to the key actors’ opinions, not enough has been done to integrate sustainability into Portuguese public universities’ plans, programmes and policies, which confirms the earlier documentary analysis that there had not been a top-down or even a mixed implementation of sustainability. Only in the field of energy were some commitments made, but they were found to lack a holistic implementation of sustainability. The documents, Law no. 62/2007, 10th September – Legal framework of higher Education Institutions and UN DESD (2005-2014): Contributions for its dynamization in Portugal, had the least number of mentions from the key actors, which was a similar result to that obtained when analyzing these two documents in an earlier phase, meaning that the proof

¹⁰ Question 6: *In your opinion how did DESD 2005-2014 have an impact on Portuguese society?*

of Governmental and ministerial implementation of sustainability through plans, programmes or policies is not straightforward (Farinha et al., 2017).

There are multiple forms of sustainability implementation in public universities, according to the number of codified references, and the top three were communitarian fund-raising for investigation and SD, MIT Program and University educational offer. This is in line with Aleixo et al. (2016a), who found fundraising and funding to be the second most referred to sustainability challenge, partly due to the reduction of public funding of HEIs. This also applies to SD knowledge in the universities and the labs associated with them, emphasizing the role that HEIs play in producing this kind of knowledge.

DESD as one of the external stimuli to induce SD engagement (Sedlacek, 2013), is not in the top 10 forms of sustainability implementation in public universities, according to the key actors. Sedlacek (2013) emphasizes that leadership is becoming more important, because of the increasingly active role of public management within universities and this happens as HEIs can serve as bridging institutions between Government, businesses and society to support sustainable regional development. Also, Foo (2013) agrees that HE is a unique intellectual contributor to society's efforts to achieve sustainability, through the practices of skills, consultancies, training, and exchange of knowledge.

Leal Filho et al. (2017a), from a study conducted with 35 universities all over the world, including Portuguese institutions, found that there are SD policies in place, already highlighted by the studies of Aleixo et al. (2016 a, b and 2017 a, b). This is in line with Clarke & Kouri (2009) who compared 6 different campus environmental management system (EMS) frameworks and conclude that policy was the first step of all, as it was expected for these backgrounds. Nevertheless, from this study it seemed that the main driver was not a top down process but, SD implementation concerning each university individually.

The DESD 2005-2014 seemed to have had some impact on society, even though mostly at the primary and secondary school levels. Schmidt et al. (2011: 174) agreed, as she stated:

“projects give preference to the younger students as targets, to the disadvantage of post-adolescent or pre-adult students, who are in theory more difficult to mobilize for

environmental care. (...). Since this tendency goes together with the preference for entertaining and recreational pedagogies in this kind of educative action, this can be seen as a symptom of ‘infantilization’ of Environmental Education/ESD in Portugal”.

This confirms what Teixeira & Koryakina (2016: 136) defend, when they mentioned that they were not very convinced about any of the reforms that might have been made regarding HE, not particularly SD, over the last two decades in Portugal. This is even more important as Teixeira & Koryakina (2016) assume that the Portuguese State does not have the capacity to steer the system strategically and the reasons, among others, are the difficulties in defining long-term objectives and pursuing them consistently, as well as defining a certain contextual framework.

This is in line with Dlouhá et al. (2017), who state that top-down efforts (and hence national and institutional policies) currently lack an appropriate underpinning framework, as sustainability criteria are not applied in university rankings¹¹.

So, we might be on the right track, as it seems that neither the Government, the Ministry nor CRUP have an active role or have produced any integrating documents on implementing sustainability implementation into universities’ policies and strategies. But universities somehow have some singular and not integrated initiatives to implement sustainability.

Nonetheless, Teixeira & Koryakina (2016: 136) seem to have a different opinion:

“Giving more autonomy to higher education institutions in their day-to-day operations, the State had to assume a coordinating role of the system as a whole, a feature that seems to be problematic in a higher education system such as the Portuguese one”.

Teixeira & Koryakina (2016) also interviewed what they called “a group of leading actors” in the system¹², with the goal of comparing perceptions of the rationales and aims

¹¹ It should be noted that after the publication of this article, which occurred in June 2019, on October 2019, the Times Higher Education world university rankings included the 17 UN SDG in their assessment (THE, 2020).

¹² This group comprised: a) a representative of the Minister for Higher Education, Science, and Technology (1999-2011); b) a former Minister of Education (1995-1999); c) the President of the National Council of

underlying the reforms that have taken place in Portugal vis-à-vis the actual changes in the funding of public HE (1995 to 2011). They concluded that the general perception indicated that the impact of these changes was very limited and that the main changes seem to have been the result of austerity's pressures as Portugal suffered a financial crisis which was associated with political instability and successive Governments' need to find alternative sources to an ever expanding and costlier higher education system.

Due to this, during 2005 and 2014 ESD could hardly be considered a policy priority. Only after the crisis and change of Government, did the parties' strategy plans start to be published (e.g. the National Environmental Educational Strategy 2020 (Agência Portuguesa do Ambiente, 2017)). The accomplishment of this strategy concerns thematic and transversal work capable of guaranteeing both national and international commitments undertaken by Portugal concerning sustainability, such as the Paris Treaty (United Nations, 2016) and the Sustainable Development Goals 2030 from United Nations – Agenda 2020 (United Nations, 2015). Thus, the call for action referred to in the document is for universities and polytechnics to disseminate best practice in curricula and the privileged spaces for development of environmental education activities, projects, or programmes (APA - Agência Portuguesa do Ambiente, 2017).

Comparing the different roles of the institutions and documents (plans, strategies and policies), Portuguese case seems to be quite different from those of some other European countries, like Wales, Poland or Spain, where there was a top-down action or a cascade process (Glover & Peters, 2013; Kościelniak , 2014; Lárran Jorge et al., 2014).

Nevertheless, the information gathered by relevant key actors of the HEI system at Governmental and institutional level was shown to be very useful when trying to understand and study the institutional framework for implementing ESD in Portuguese

Education; d) the President of the National Agency for Quality and accreditation in Higher Education (1999-2011); e) the head of the National Commission on Access to Higher Education (1995-2011); and f) the Chairman of the Council of Rectors of Public Universities (1999-2011).

HEIs. This is aligned with other studies that highlight the role of stakeholders in implementing sustainability (Glover & Peters, 2013; Dlouhá et al. 2017).

This study provides findings, conclusions, and recommendations that ultimately motivate HEIs to achieve Sustainable Development (SD) and to be more effective integrating sustainability into their policies and strategies, and also learning with other European good examples.

Nonetheless, this research has two main limitations. The first is that the convenient sample does not allow the results to be generalized to the Portuguese Higher Education System. Second, not only the number of interviewees limited the study, but also their nature; it would be very interesting to have the opinions of the Science, Technology and Higher Education Minister and Secretaries of State. For his relevance, it would also have enriched the study to have interviewed at least one more Chairperson of the CRUP (namely the leader from 2010 and 2014), but that was not possible despite best efforts. The number of interviewees for this exploratory research was indeed limited. But the aim of the interviews with relevant key actors was to confirm earlier official documentation analysis and each interview was very complete, allowing approaching data saturation (Saunders et al., 2009), that means, additional data collected would provide little, if any, information.

The following steps of the investigation will be undertaken to overcome those limitations:

- (i) plans, policies and strategies at universities will be analyzed;
- (ii) a questionnaire survey will be applied to the person responsible for the sustainability implementation in the HEI.

This will hopefully improve the new contribution of this research.

6. Conclusions

Seven interviews with key actors were conducted to provide a better understanding of the compromises concerning ESD in Portuguese public universities, as well as the possible

forms of the DESD goal implementation and their impact in the strategies and actions of the universities.

Commitment to the implementation of public policy and sustainability at university level is of critical importance for the effectiveness of the process concerning inclusive ESD. Subsequently, there is an urge for a change in the Portuguese universities' paradigm and characteristics, and still several obstacles to overcome.

From this research, there are some final remarks about ESD implementation at public universities:

(a) After analyzing the official documentary sources and interviewing the key actors, who stressed other uncovered published and published legislation, only a few documents are partly linked to sustainable development.

(b) It seems there was no incorporation of ESD through Governmental or ministerial policy and strategical level in the public universities and that the Government's only major engagement was the MIT Portugal Program (creating the PhD Energy Sustainability Program);

(c) The universities did not have any top down policy or strategy in terms of SD. Neither the Government, the Ministry nor CRUP had an active role or produced any integrator document in the sustainability implementation into policies and strategies of universities.

(d) The impact of the UN DESD 2005-2014 in Portuguese society was mainly through the dissemination of problems and solutions of "lifelong learning", mostly at primary and secondary schools.

The economic crises that the country suffered over the last decade and political instability could explain this lack of commitment. Nevertheless, Portuguese universities' autonomy and social responsibility led them to develop several timely initiatives and policies towards ESD. These are considered the main lessons of this paper, and can explain similar patterns occurring in other countries, where implementation of ESD at the higher education level is still in early stages of development or where no centralized system is implemented. In

addition, the method used for data collection, interviewing relevant key actors involved in the HEI institutional framework, was shown to be very useful when no plans, programmes or policies exist or are not available, or to complement their information.

Further investigation will be undertaken, including the analysis of plans, policies and strategies at university level and a questionnaire survey will also be applied to the person responsible for implementing sustainability in the HEIs, to better understand how to overcome sustainability implementation in public universities in Portugal and to propose best practices and recommendations.

CHAPTER 3

Sustainability Strategies in Portuguese Higher Education Institutions: Commitments and Practices from internal insights

References¹³: Farinha, C., Caeiro, S., & Azeiteiro, U. (2019). Sustainability Strategies in Portuguese Higher Education Institutions: Commitments and Practices from Internal Insights. *Sustainability*, 11(11), 3227. MDPI AG.

Available at: <https://doi.org/10.3390/su11113227>

Abstract

The Copernicus Declaration of 1994, which was understood as a commitment to Sustainable Development (SD) by top management in higher education, was signed by many universities. This signature worked as an important driver for these institutions to put different dimensions of SD principles into practice. In Portugal, a Southern European country, six of the fourteen universities belonging to the Portuguese University Rectors Council signed the declaration, but no attempt has been made to evaluate how these public universities integrated education for sustainable development at policy and strategy levels. This paper presents the results of a study aimed at identifying to what extent the integration of sustainability in the fourteen universities was achieved, through their own strategic and activity plans, activity and sustainability reports. A detailed content analysis was conducted on these plans and reports within the period from 2005 to 2014 (the time frame of the United Nations Decade of Education for Sustainable Development), to identify the main commitments and practices. Notwithstanding a lack of national integrated strategies or policies related to education for SD, the results show that the movement made progress at the university level, with good examples and initiatives at several universities. This paper highlights the importance of analyzing the content of plans and reports from Higher Education Institutions when intending to assess and define a country profile for the implementation of sustainability in the educational sector. In addition, this research, conducted in Portugal, may be helpful to understand and value how SD is being

¹³ It should be noted that MDPI's "Sustainability Journal" has different editing rules from the other articles used on this thesis. Hence, for the purpose of this dissertation it was decided to maintain the article, including its references and appendices, as published in the journal.

applied in the policies and strategies of other European HEIs as well as to share and encourage best practices and ways of improvement.

Keywords: *Commitments; Education for Sustainable Development; Portuguese; Practices; Sustainability Reports; Universities*

1. Introduction¹⁴

For the decade from 2005 to 2014, much research has focused on how Sustainable Development (SD) was incorporated in Universities, especially because Higher Education Institutions (HEIs) signed Declarations, Charters and Initiatives (DCIs) to demonstrate their top management's commitment to sustainability in their system [1,2,3].

By the end of the above-mentioned decade, more than 1000 universities had ratified DCIs, so HEIs were engaged in fostering transformative SD [2]. Until now, there is a scarcity of investigation looking at the extent to which planning for SD can help HEIs to assess their performance and to determine whether the aims of their strategies and practices have been met [3].

In Portugal earlier research showed that embedding sustainability (the "Top-Down" Approach) is insufficiently developed in Portuguese governmental institutions at university level [4,5].

In addition, the debate concerning HEIs' role towards SD has recently begun [6,7] and the few events organized so far were mostly dedicated to the environmental perspective [8]. Moreover, SD policies are key factors for a university's successful engagement concerning sustainability matters and indicate how active they are in this field [8]. One of the levels of sustainability integration in higher education (HE) is at the institution level within the macro HE public policy system [9]. Nonetheless, no attempt has been made to assess how Portuguese public HEIs are integrating education for sustainable development (ESD) at

¹⁴ See annexed data on this Chapter #3 in Appendix C.

policy and strategy levels, and how the documental analysis of HEI plans, reports and strategies can be a useful approach to evaluate SD integration in Universities. The research question is to what extent ESD has been integrated in the Portuguese public HEIs' policies within the United Nations Decade of Education for Sustainable Development (UN DESD) 2005–2014, and consequently to provide insights about their (best) practices.

The purpose of this study, conducted within the timeframe of the United Nations Decade of Education for Sustainable Development (UN DESD) 2005–2014, is to evaluate the extent to which ESD has been integrated in Portuguese public HEIs through the treatment and analysis of the universities' (i) strategic activity plans (PE), strategic plans and development plans (PDE) and activity and operational plans (PA); (ii) activity reports (RA), strategic activity reports, sustainability reports (RS) and annual financial reports (RC), as well as, (iii) responsibility and assessment frameworks (QUAR¹⁵ – [Quadros de avaliação e responsabilização]).

These plans relate to what HEIs are planning to accomplish in the short or medium term, depending if it is an annual or a quinquennial program, and the reports relate to what has been achieved from within the plan or beyond the plan.

1.1 Universities' Commitments to implement ESD

In October 1990, the Taillores Declaration was signed by 30 universities worldwide. This early declaration recognized the fundamental role that universities should have in the future concerning the implementation and dissemination of sustainability:

Universities have a major role in the education, research, policy formation, and information exchange necessary to make these goals possible. Thus, university leaders must initiate and support mobilization of internal and external resources so that their institutions respond to this urgent challenge [10].

Later, the 1992 Conference of European Rectors at the United Nations Conference on Environment and Development (UNCED), which took place in Rio de Janeiro, made an

¹⁵ QUAR illuminate the universities' mission, their strategic and operational goals, their key performance indicators and aims, as well as the financial and human resources available to facilitate moving towards targets and the achievement and effectiveness of such targets.

urgent appeal for the involvement of universities in SD and for an inclusive strategy for building a sustainable future which is equitable for all. In Europe, this declaration was signed by more than 320 HEIs in 38 countries [11].

In 1994, the Copernicus program developed its own strategy on the ten action principles to preserve the environment and promote SD, which was signed by 196 universities [12]. The universities' role was defined as follows:

It is consequently their [universities] duty to propagate environmental literacy and to promote the practice of environmental ethics in society, in accordance with the principles set out in the Magna Carta of European Universities and subsequent university declarations, and along the lines of the UNCED [Rio Conference in 1992] recommendations for environment and development education [12]

In May 2005, at the European Higher Education Ministerial Conference held in Bergen, Norway, there was a strong reference to SD for the first time. It was said, when describing the Bologna Process, that “our contribution to achieving education for all should be based on the principle of sustainable development and be in accordance with the ongoing international work on developing guidelines for quality provision of cross-border higher education” [11].

At the United Nations Rio + 20 conference in 2012, the commitment of Higher Education Sustainable Initiatives (HESI) was announced, including teaching sustainable development concepts, encouraging research on SD, making campuses more sustainable and involving the community in all these actions, committing institutions to concrete results and actions [13].

Also, the UNESCO World Conference on ESD, held in Aichi-Nagoya (Japan) in 2014, adopted a declaration and a call for urgent action to further strengthen and scale up ESD, where HEIs have a special role [14], namely in transforming societies and in key aspects of citizenship.

In the post-2015 DESD agenda, these characteristics were emphasized and linked to the establishment and achievement of the Sustainable Development Goals (SDGs) defined by the United Nations in 2015 [15]. In fact, the seventeen SDGs were set placing education at

the heart of the promotion of SD [16], proposing a HE field that is greatly influenced by the global sustainability agenda as well as by the management education requirements [17].

From a worldwide survey linked to the seven dimensions of the recognized university system [2], it was concluded that there is a strong relationship between SD commitment, integration and the signing of DCIs, showing that there are two HEI clusters:

“the ones at the forefront, which show high commitment, have signed a declaration or belong to a charter, and have engaged in implementing SD; and those HEIs, which are lagging in commitment, implementation, and declaration signing” [2].

1.2 A worldwide integration of ESD in Universities' strategies and policies

HEIs can implement ESD in several dimensions in order to be as holistic as possible. The more common dimensions are: (1) Institutional framework (i.e. the HEIs' commitment), (2) Campus operations, (3) Education: courses on SD, programmes on SD, transdisciplinary curricular reviews, including 'Educate-the-educators' programmes (which promote competencies in EDS to enable an integrated approach of knowledge, procedures, attitudes and values in teaching through multidisciplinary and transdisciplinary teams [18]), (4) Research, (5) Outreach and collaboration, (6) SD through on-campus experiences, working groups, policies for students and staff among other practices, and (7) Assessment and reporting [2,19].

Universities worldwide are experiencing an increasing trend towards responding to the need for sustainability and various knowledge gaps [20], as well as collaborating and contributing to the generation of sustainability values, attitudes, and behaviors within future regenerative societies [21]. Regarding some European countries, access to quality education is so critical for development [22] that the European Parliament has continuously called for the allocation of its budget to investment in this sector [23]. Universities can use low-carbon campuses as living laboratories in shaping the leaders of future sustainability thought. Many HEIs are already involved in mainstreaming the environment and sustainability into their curricula, training, research and community engagement activities [24].

From the results of surveying a sample of universities from Germany, Greece, United Kingdom (UK), United States of America (USA), South Africa, Brazil and Portugal [8], it was reported that there is a widely-held belief that SD policies are essential for HEIs to successfully engage in matters related to sustainability and that such policies show how active they are in this field. Therefore, a university must be considered active and have formal policies on SD as a pre-condition for successful sustainability efforts [25].

Considering HEIs' degree of commitment to and institutional trust in sustainability in USA, it was noted [25] that universities are uniquely positioned as knowledge disseminators, behavior consolidators and idea innovators towards a resilient and impartial society, as they offer a superior learning environment and campus lifestyle experience to initiate a more holistic understanding and contemplation around sustainability.

Therefore, HEIs have embedded sustainability initiatives into their core activities, curriculum, research, community, and operational, to respond to the worldwide transformation towards a sustainable future [26].

1.3 An implementation research gap in Portuguese public universities

Despite international studies on ESD in European universities which provide best practices and examples [27,28,29], this area represents a gap in higher education research in some countries (e.g., Czech Republic, Poland, Spain) [30,31,32] and the insufficient number of studies in Portugal concerning Strategic Environmental Assessment was emphasized [33].

These detailed, national scale studies can contribute to a better evaluation of HEIs' levels of effort and success in contributing towards encouraging worldwide sustainable development and the role of academia in meeting this purpose [17].

In 2007, which falls within the decade 2005-2014, the Portuguese Government passed the Decree-Law 242/2007, which transposed the Directive 2001/42/EC, promoted the effective institutional autonomy of universities [34], and facilitated environmental assessments regarding the effects of certain plans and programmes [32].

In comparison to other European countries, Portugal was far behind in externally oriented activities aimed at building capacity within local communities to promote SD, and

Portuguese HEIs were classified as “laggards” and/or “late majority” in integrating SD in education, in research on sustainability and in inclusive development in universities, in particular when compared with other Southern European countries [6].

Despite having signed Declarations and/or Charters, Portuguese public HEIs may or may not have implemented SD, while others that did not sign any commitment have engaged in implementing sustainability.

Regardless of previous research, it is important to comprehend how Portuguese public universities are applying ESD at policy and strategy levels (between 2005 and 2014), since no attempt has been made to evaluate their commitments and practices in a systematic and detailed way.

2. Material and methods

2.1 Sample of universities

Considering the UN DESD 2005–2014, the University Higher Education Institutions (UHEI) sample was based on the effective members of the Portuguese University Rectors Council (CRUP) during the analysis period (2005–2014), which correspond to all public universities. These HEIs comprise: UAc - University of the Azores [36], UMinho - University of Minho [37,38,39], UAb – Universidade Aberta [40,41], UP - University of Porto [42,43], UAlg - University of Algarve, UTAD - University of Trás os Montes e Alto Douro [44], UÉ - University of Évora [45,46], UBI - University of Beira Interior [47,48,49,50], UC - University of Coimbra [51,52], UTL - Technical University of Lisbon, UL - University of Lisbon¹⁶, UNL - NOVA University of Lisbon [54], UA - University of Aveiro [55] and UMa - University of Madeira.

These public HEIs, together with ISCTE-IUL - University Institute of Lisbon [56] and UCP - Universidade Católica Portuguesa [57], represent the core of the Portuguese national higher education system [58].

¹⁶ In July 2013, two large public universities, UTL and UL merged to increase their scale, attract a larger volume of students, capitalize on the prestige of their faculties, and help them to achieve a greater leadership role in the European context. “ULisboa brings together various areas of knowledge and has a privileged position for facilitating the contemporary evolution of science, technology, arts and humanities” [53].

The creation in 1979 of CRUP—a Portuguese university associative structure—constituted a major step in the decentralization of the Ministry of Science, Technology and Higher Education (MCTES) responsibilities for Higher Education [59]. One of its major working areas is guaranteeing universities’ coordination and their representativeness, while ensuring their autonomy [58] (see Appendix C, figure C.1).

Despite the researchers’ efforts, it was not possible to obtain supplementary documentation from all the universities that belong to CRUP.

The final UHEI sample turned out to be 14 public universities and some have similar characteristics such as geographical location, number of students and campus area (see Table 6).

Table 6 Characteristics of Portuguese Public Universities

Public UHEIs		Number of students	Campus area (m2)	Emissions of CO2 Eq.(ton) * 1000 ton CO2 Eq.	
Acronymous	Founded	Academic year		Value	Reference year
UMinho	1973	19.500 f)	400.000 m2		
			Green space aprox. 40% within 3 Polos: Gualtar, the largest Polo (Braga), Azurém and Couros Polos (both in Guimarães). Areas are unavailable	16	2015
UP	1911	29.796 c)	Consisting of 3 main Polos spreading out all over the city of Porto: Centro (the largest), Asprela and Campo Alegre. The polos areas are unavailable	2,849	2011
UBI	1979	7.262 f)	4 Polos whose areas are unavailable	NA	NA
UNL	1973	19.867 c)	30.000 m2 is aprox. the area of FCT/UNL (Caparica Campus) which is one out of 9 Faculties of UNL, in Monte da Caparica (Almada)	NA	NA
UTAD	1986	6.609 d)	3 Polos whose area is unavailable	NA	NA
UC	1290	21.390 c)	3 Polos whose area is unavailable	NA	NA
ISCTE	1972	9.234 c)	2 buildings and 1 autonomous ala	NA	NA
UA	1973	14.280 c)	921.500 m2		
			With its 3 campi, UA has its main Campus (Santiago), others in Águeda and Oliveira de Azeméis	NA	NA
ULisboa	2013	48.47 b)	8 campuses make up Ulisboa which are:		
			Ajuda, Alameda, Chiado, Cidade Universitária, Jamor, Loures, Quelhas, Tagus Park	NA	NA
UTL	1911	25.574 a)	---	NA	NA
UL	1911	22.143 a)	---	NA	NA
UAb	1988	8.590 b)	2 sites, Rua da Escola Politécnica and Rua Braancamp in Lisbon	NA	NA
UAlg	1979	9.708 f)	63.084 m2 as UAlg has 4 campus: Penha (centre of the city of Faro), Gambelas, Saúde and Portimão	NA	NA
UÉ	1979	8.970 f)	UÉ has 9 sites, one is outside the city (Mitra), other is the gimnosdesportiv pavillion; others are buildings	NA	NA
UMa	1988	3.389 f)	The university has only 1 campus	NA	NA

Confidentiality was ensured by allocating an alphanumeric identification to each public university (HEI_01 to HEI_14) so that the names of the respective institutions did not appear in the publication findings and results.

Legend: Information not available (NA). Each year corresponds to academic year; academic year. a) 2012/2013 (Source: CRUP, 2018); b) 2014/15; c) 2015/2016; d) 2016/2017; e) 2017/2018; f) unknown.

2.2 Data collection and time frame

This study uses a qualitative approach [60] and a detailed content analysis method.

Institutional documents were analyzed to:

- (a) find out how each public HEI integrated sustainability, whether under any DCI or not;
- (b) discover the commitment of each public university to SD;
- (c) provide insights about (best) practices in implementing ESD at public universities.

The following types of document corresponding to the period 2005 to 2014, i.e., a 10-year period (see Table 7) for each HEI, were:

- Plans (PA, PDE and PE),
- Reports (RA, Strategic Activity, RC and RS) and
- QUAR.

The data were collected between 1st January 2015 and 30th June 2016, through public university websites, email contacts and some UHEIs' documentation centers', mainly due to their willingness to participate in this study. After the data collection period, no further documentation was considered despite its availability on websites.

Eventually, universities might publish this type of documentation, but it was not available for the researchers' during the time frame of the collection period despite their efforts.

Table 7 Document type by Portuguese public University

Documents	HEI_01	HEI_02	HEI_03	HEI_04	HEI_05	HEI_06	HEI_07	HEI_08	HEI_09	HEI_10	HEI_11	HEI_12	HEI_13	HEI_14	sum
Activity reports (RA)/Strategic Activity Reports	10	9	8	10	6	7	1	-	2	2	4	3	1	-	63
Activity and operational plans (PA)	3	7	5	9	4	5	5	6	1	1	-	-	-	-	46
Strategic plans and development plans (PDE)/Strategic activity plans (PE)	2	4	3	2	3	2	-	2	1	1	-	-	-	1	21
Responsibility and assessment framework (QUAR)	5	6	-	-	-	-	4	-	-	-	-	-	-	-	15
Annual financial reports (RC)	7	-	2	-	3	1	-	-	-	-	-	-	1	-	14
Sustainability reports (RS)	3	-	6	-	-	-	-	-	-	-	-	-	-	-	9
sum	30	26	24	21	16	15	10	8	4	4	4	3	2	1	168

Overall, were gathered for treatment and analysis 168 documents from the 14 public universities.

2.3 Documental approach of public Universities sustainability integration

HEI_01, HEI_02, HEI_03, HEI_04, HEI_05, HEI_06 and HEI_07 contributed 85% of all the collected documents (see Appendix C, figure C.2). Even though seven universities provided the vast majority of the institutional documents sample, the aim was to find out how each public HEI implemented sustainability and their commitment to SD, and to provide insights about best practices.

The year 2011, which was the year in which Portugal came under the international financial assistance programme, corresponded to the highest number of documents gathered. This may be explained by the increased need to support financial reports with long term planning.

Considering the first half of UN Decade 2005–2014, corresponding to the period from 2005 to 2009, concerning document type, PA, PDE, PE, RA, Strategic Activity Reports, and RS represented 83% of all the documents.

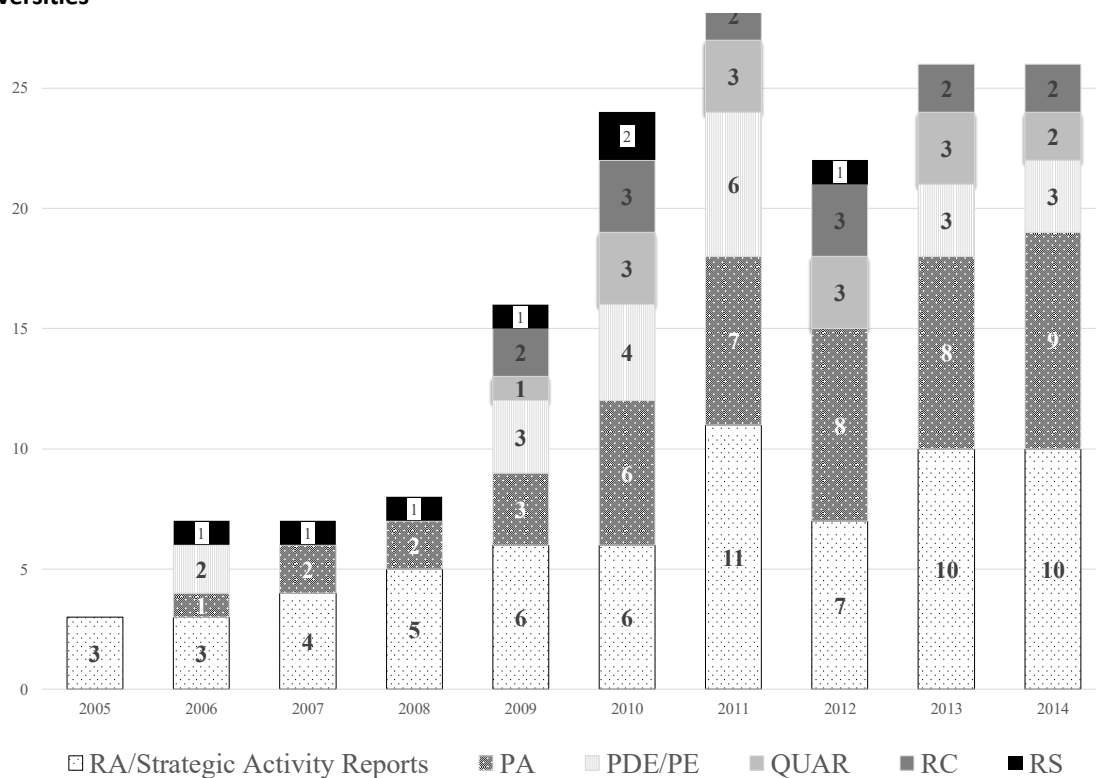
In the second half of the period 2010–2014 there was not much difference (80%). RS accounted for 10% and 4% of the collected documents in the first and second half of the Decade 2005–2014, respectively, and were published either by HEI_01 or HEI_03. From the second half of the DESD, around 33% and 43% were RA/Strategic Activity Reports and

PA/PDE/PE, respectively. There seems to have been more activity planning than reporting, which might not be so true if RS and RC are combined.

The scenario is quite different when analyzing the documentation obtained in the period 2005 to 2009, as it seems there was more reporting and less planning. Adding RC (5%) and RS (10%) accounts for almost 66% of reporting activity altogether (see Figure 11).

From 2005 to 2014, almost 80% of the collected documentation was related to activity

Figure 11 Distribution of document type through the UN Decade 2005–2014 in Portuguese public universities



planning or reporting (see Appendix C, Figure C.2). Despite the few sustainability reports published by the public HEIs (only two did so, UMinho and UP), they are of utmost importance for the content analysis concerning sustainability implementation because they were published during the UN Decade.

2.4 Documental sample data treatment and analysis

Data treatment and analysis was divided in a four-step approach:

1. When collecting documents, few Universities possess documents such as RC and QUAR. Since this is the case, this constitutes a drawback in the study to (better) assess policies and strategies at university level, so it was the first cut in the treatment phase. From an overall sample of 168 documents it was reduced to 139 (the “major documents”) (see Table 8). From here, the data treatment was made.

Table 8 Four-step approach in data treatment and analysis

Steps	Document type							Process
	RA/Strategic Activity Reports	PA	PDE/PE	QUAR	RC	RS	HEIs' sum	
Step 0	63	46	21	15	14	9	168	
	RA/Strategic Activity Reports		PA			RS		Data collection
Step 1	63	46	21			9	139	Data treatment
Step 2	63	46	21			9	139	Data treatment&analysis in a coding system
Step 3	63	46	21			9	139	Content analysis in a systematic review
Step 4	63	46	21			9	139	Content analysis with defined nodes (HEIs and Dimnsions) [2] and subcategories (themes)

- The documents were selected, taking into account neither type nor university origin, to be treated and analyzed considering the highest frequency of keywords (see table 4) in the defined coding system obtained in the content analysis of a previous study [4]. The following results were, in descending order, “Integration or intervention or implementation” (the main reference found), followed by “Environmental Education” (these two were the main references), then “University Higher Education or University” and “Sustainability(ies) or sustainable(s)”.

2. The content was then analyzed in a systematic review, where a node corresponds to a public UHEI and each subcategory to a type of document. This coding technique was used to analyze the documents. As coding is a process to generate categories, the analysis

started by using descriptive coding, where words and sentences from document transcripts were labelled using relevant words or phrases [60].

Table 9 The highest frequency of Keywords.

1. DESD – Decade for Education for Sustainable Development	8. Development
2. Environmental Education	9. Transdisciplinary
3. Sustainable Development	10. Holistic
4. Science for Sustainability	11. Integration
5. Environmental Management	12. Higher Education/Universities
6. Sustainability/Sustainable	13. Curricula/Curricular Plan/Curricular Programme
7. Environment/Environmental	14. Campus
15. Education for Sustainable Development *	

* We added this keyword as it was found to be important in many of the documents analyzed.

3. Other nodes were built hereinafter as “Dimensions” relating to the recognized university system [2]:

- Institutional framework (Dimension #1);
- Campus operations (Dimension #2);
- Education (Dimension #3);
- Research (Dimension #4);
- Outreach and collaboration (Dimension #5);
- SD through on-campus experiences (Dimension #6); and
- Assessment and reporting (Dimension #7).

The themes where ESD has been implemented in HEIs were organized in dimensions and correspond to subcategories. Each subcategory was called a sustainability implementation action (SIA) within the content analysis methodology [61]. In the end, the coding system was rearranged again based on the number of codified references, and the sustainability

implementation actions (SIA) renamed, which were obtained after the treatment and analysis of the major documents.

The process consisted of organizing the disclosed data into distinct categories and/or new nodes, through a classification.

Every time a document was treated and analyzed the code was modified to reflect the correct adjustments. This was, therefore, a collaborative process based on diversified readings before treating and analyzing the available documentation—139 documents from the 2005 to 2014 period—from which at least three adjustments were made to some of the items (a suggested procedure [62]).

The dimensions of the recognized university system [2] were used, as well as the themes associated with each aspect as a proxy of integration sustainability in each HEI. This was a cataloguing method in which an organized codebook was produced.

Lastly, all data contribute to the definition of a country profile for the implementation of sustainability in the HE sector.

For the qualitative content analysis, NVivo (version 11) software was used [63].

3. Results

3.1 The sustainability implementation actions in public Portuguese HEIs

Overall, considering the seven dimensions [2] 66 themes were found as sustainability implementation actions (see Figure 13).

All Portuguese public universities seemed to have been implementing sustainability and more than 50% of actions are not exclusive to a single UHEI (see Table 10). Among the seven dimensions, “Campus operations”, “Outreach and collaboration” and “SD through on-campus experiences” represented almost two thirds of the total sustainability implementation actions (see Table 10, Figure 12 and Figure 13). It thus seems that these were the main dimensions by which the Portuguese UHEIs implemented sustainability through strategies and policies.

Table 10 Number of Sustainability implementation actions by dimension and University.

Sustainability implementation actions by Dimension	University														Sum *
	HEI_03	HEI_08	HEI_01	HEI_11	HEI_06	HEI_09	HEI_04	HEI_13	HEI_10	HEI_12	HEI_02	HEI_05	HEI_07	HEI_14	
Campus operations	5	2	5	0	3	1	2	0	0	0	0	1	0	0	19
Policies and activities to reduce paper consumption such as e-communications, or double-sided copying	1	-	1	-	1	-	-	-	-	-	-	-	-	-	3
Energy efficient equipment	1	-	1	-	-	-	1	-	-	-	-	-	-	-	3
Plans to improve energy efficiency	-	-	1	-	1	-	1	-	-	-	-	1	-	-	4
Sustainable landscaping	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Renewable energy usage	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2
Plans and efforts to reduce GHG emissions	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Sustainable food & Diet practices	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Biodiversity	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
Green purchasing from environmentally and socially responsible companies	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Plans to improve management waste (waste bins to separate and recycle waste (recycling solid waste))	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Outreach and collaboration	1	5	1	1	0	0	0	3	1	1	0	0	0	0	13
SD partnerships with other society stakeholders	-	4	-	-	-	-	-	2	-	-	-	-	-	-	6
Academic staff involved in voluntary advisory activities in SD	1	1	1	-	-	-	-	-	1	-	-	-	-	-	4
Joint degrees with other universities	-	-	-	1	-	-	-	-	-	1	-	-	-	-	2
Part of interdisciplinary SD expert networks	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
SD through on-campus experiences	5	1	1	0	0	1	0	0	1	0	0	0	1	1	11
Policies that promote SD for all students and staff	1	1	1	-	-	-	-	-	1	-	-	-	-	-	5
SD efforts are visible throughout the campus	1	-	-	-	-	-	-	-	-	-	-	-	1	-	2
SD working group with members from different departments	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Sustainable practices for students	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Student participation in SD activities	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SD awareness raising in the campus	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Institutional framework	2	0	2	4	0	0	0	0	0	1	0	0	0	0	9
Signature of a Declaration, Charter or Initiative (DCI) within SD, ESD or sustainability during UN DESD 2005-2014	1	-	1	2	-	-	-	-	-	1	-	-	-	-	5
Existence of policy for implementing SD in University	-	-	1	1	-	-	-	-	-	-	-	-	-	-	2
Inclusion of SD in the vision and mission, goals and objectives of the University	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Existence of a Strategic Plan for implementing sustainability in University	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Education	0	2	0	0	0	2	1	0	0	0	1	0	0	0	6
Courses on SD, programmes on SD	-	2	-	-	-	-	1	-	-	-	1	-	-	-	4
Teaching across (fostering the link between) the natural sciences and social sciences faculties	-	-	-	-	-	2	-	-	-	-	-	-	-	-	2
Research	0	2	1	0	1	0	0	0	0	0	0	0	0	0	4
Providing fund-raising for SD Research	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Existence of Patents in the field of SD	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
Creation of SD new knowledge and technologies	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Existence of na SD Institute or Research Centre	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Assessment and Reporting	2	0	1	0	0	0	0	0	0	1	0	0	0	0	4
Sustainability reports	1	-	1	-	-	-	-	-	-	-	-	-	-	-	2
Assessment of SD issues as SD integration instruments and tools within their University	1	-	-	-	-	-	-	-	-	1	-	-	-	-	2
Sum *	15	12	11	5	4	4	3	3	2	2	2	1	1	1	66

* Sum of Sustainability implementation actions

Considering the number of sustainability implementation actions (see Table 10) throughout the HEIs, the top three were:

- SD partnerships with other society stakeholders (#6), which are linked to “outreach and collaboration”;
- Policies that promote SD for students and staff (#5), which are linked to “SD through on-campus experiences”; and
- Signature of DCIs within SD, ESD or sustainability during UN DESD 2005–2014 (#5), which is linked to “institutional framework”.

Figure 12 Number of Sustainability implementation actions by each dimension

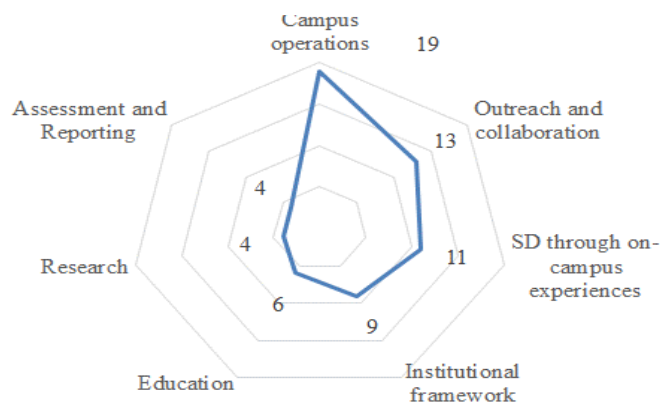
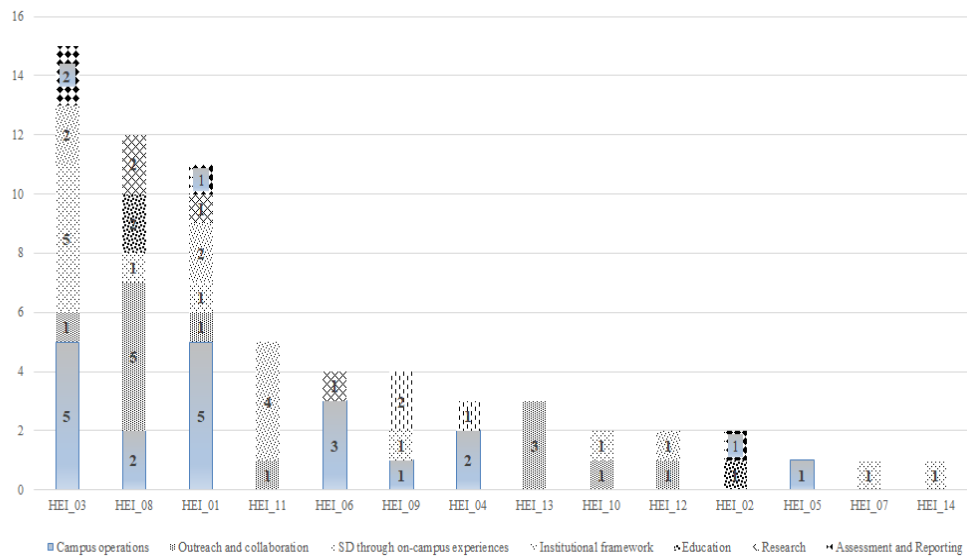
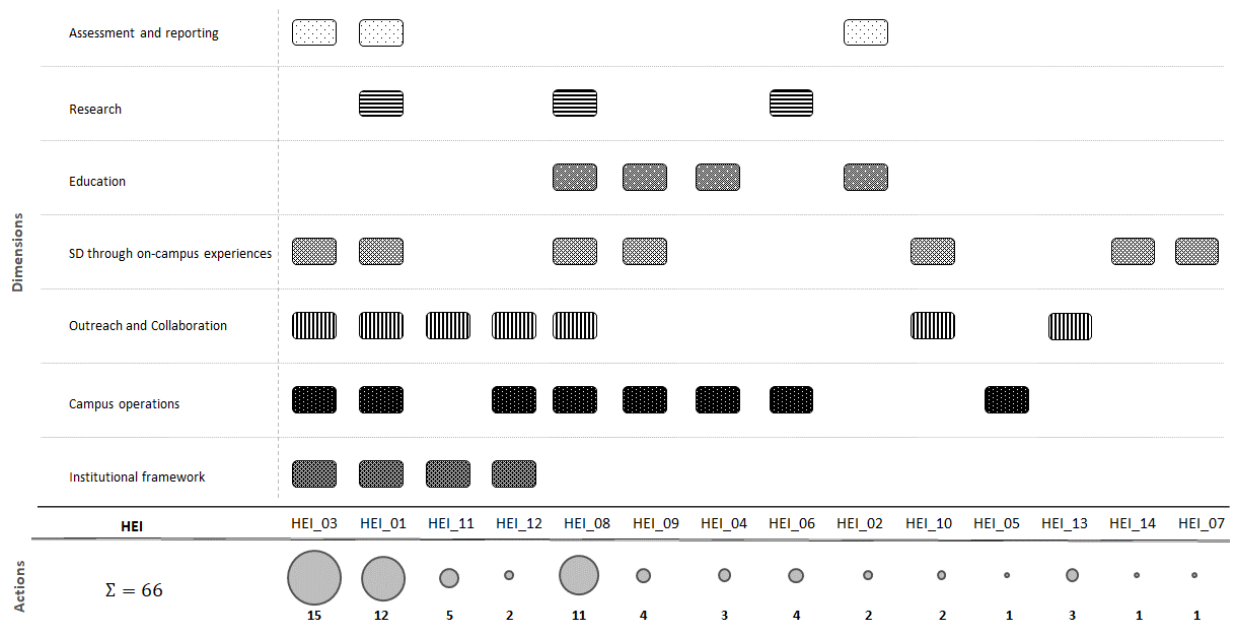


Figure 13 Number of Sustainability implementation actions in each public University in each dimension



Taking into consideration the treated and analyzed documents, universities’ actions relating to ESD seemed to have been taken in “isolation” and were not integrated in a whole institution approach. Each HEI acted according to a tank of actions— “think tank” (see Figure 14).

Figure 14 Think tank of initiatives in Portuguese public Universities



Each University may have taken one or more than one path to integrate their strategies and policies on sustainability, but it seems any integration did not keep up with the simultaneous pace of action.

The findings in Portuguese public HEIs also suggest that identical SD integration during the DESD 2005–2014 could have occurred for different reasons:

- Some universities have some similar characteristics such as geographical location, number of students and campus area (see Table 6). There are no available data concerning campus areas of 10 HEIs.
- Some universities established partnerships in their best interest as a win-win strategy, concerning mainly education and research dimensions.

3.2 The DCI and the commitments of the Portuguese public HEI

As of 1st February 2018, 502 institutions had signed the Taillores Declaration. However, in 1990, the NOVA University of Lisbon (UNL) was listed as the only Portuguese signatory HEI, according to the Association of University Leaders for a Sustainable Future [10].

The findings indicate that UNL was deeply involved in the outreach and collaboration and institutional framework Dimensions through the following sustainability implementation actions: (1) joint degrees with other universities and (2) the existence of policy and a strategic plan for implementing SD in the University.

Besides having signed the Taillores Declaration, UNL belonged to the Copernicus Charter in 1994 and became a member of the Copernicus–Campus Alliance. According to these documents' principles, sustainability should be incorporated in a university's faculties, departments and other entities. The signature by UNL of both the Declaration and the Charter signaled an official commitment to SD by this university.

Nevertheless, other Portuguese HEIs also signed the Copernicus Charter such as UTL, UP, UMinho, UL and UCP. The results concerning UMinho and UP will be shown in section 3.3.

The results indicate that like UNL, UTL was involved in the outreach and collaboration Dimension through the creation of joint degrees with other universities.

The overall results indicate that UNL and UTL (which, after the merger with UL, resulted in ULisboa), representing almost 30% of all HEIs' students, were both involved in the creation of a joint degree as mentioned. Nonetheless, it cannot be assured through any DCIs that this fact is due to their commitment to SD.

3.3 The commitments of HEIs with Sustainability Reports (RS) and DCI

UMinho and UP were the only two out of the six Portuguese Copernicus Charter signatories that developed the "assessment and reporting" through Sustainability Reports. RSs enable organizations to take into consideration the impact of a wide range of sustainability issues, allowing them to be more transparent about the risks and opportunities [64].

Owing to UMinho's strong cultural activity, this HEI uses Global Report Initiative (GRI) as Guidelines for sustainability reporting (2010 & 2011) and improved its methodology in 2012/2013 [37] (pp. 113-114) by including a new (cultural) dimension [38].

According to the RS from 2011 [37] (pp.113-114), globally UMinho is on its way to sustainability considering economic, environmental and social indicators, namely due to its direct and indirect impact in the local economy. As an example, the production of dangerous solid waste had been reduced by 2.5 ton. from 2009 to 2011 and the 2015 emissions of CO2 equivalent (ton) * 1000 ton. CO2 equivalent were 16 in a campus area of 40 ha (see also Table 6).

Nevertheless, environmental performance should be improved to reinforce UMinho's commitment to sustainability, according to the University Rector (see table 6). From the analysis of the documents, the sustainability implementation actions of UMinho were mainly based (almost 50% of the total number of UMinho's initiatives) on the "campus operations" Dimension either through (1) plans to improve energy efficiency, (2) energy efficient equipment, (3) policies and activities to reduce paper consumption, (4) plans to improve the management of waste or (5) green purchasing from environmentally and socially responsible companies. There were also actions based on "Institutional framework" through the existence of policies for implementing SD in the university.

The National Strategy for Ecological Public Purchases by Resolution of the Council of Ministers, i.e., a government decision, was found to be used by UMinho concerning green purchasing as well as the Energetic Efficiency Program in Public Administration (Eco.AP) regarding energy efficiency.

There are some best practices in this university seen in the Institute of Science and Innovation for Bio-Sustainability (IB-S) and Landscape Laboratory.

Table 11 Sustainability reports: UP and UMinho

TAILLORES DECLARATION (1990)	COPERNICUS CHARTER (1994)	Sustainability Reports												
		Periods Years		Available Metodology	# Indicators	Reference Years	Periods Years					Available Metodology	# Indicators	Reference Years
		2006	2007				2008	2009	2010	2011	2012/2013			
-	UP			Global Reporting Initiative (GRI) Guidelines. Dimensions: 1) economic; 2) social; 3) environmental	24 (2006) to 31 (2007)	2006-2007						Model developed to assess, monitor and report sustainability in Universities. Dimensions and categories: 1) Academic community; 2) Operations; 3) teaching; 4) Impact on the society	47 (2008; 2009) to 44 (2010) and to 42 (2011)	2008-2011
-	UMinho											Global Reporting Initiative (GRI) Guidelines. Dimensions: 1) economic; 2) social; 3) environmental 4) Cultural (NEW in 2012/2013)	24 (2010) to 26 (2011) to 62(2012/2013)	2007-2013

The first Portuguese HEI that used GRI Guidelines was the Engineering Faculty of University of Porto (FEUP) in 2006, and from 2008 onwards, however, the RS are only related to the faculty and not the whole university. The GRI model was used to assess, monitor and report sustainability with a focus on the academic community, operations, teaching and impact on society, which seems to have some similarities with the Sustainability Assessment Questionnaire (SAQ).

It should be noted that FEUP is concerned with all Dimensions and not only environmental ones [42].

These sustainability implementations actions by university of Porto seem to have been based on many different Dimensions. Concerning the “campus operations” Dimension, actions seem to occur through (1) sustainable landscaping, (2) policies and activities to reduce paper consumption, such as e-communications or double-sided copying, (3) renewable energy usage and (4) energy efficient equipment.

There were also actions relating to “SD through on-campus experiences”, through (1) policies that promote SD for all students and staff, (2) sustainable practices for students, (3) a SD working group with members from different departments, (4) SD efforts that are visible throughout the campus and (5) student participation in SD activities, such as collaboration in multiple social solidarity projects.

Concerning the “assessment and reporting” Dimension, UP seemed to have implemented sustainability through (1) RS and (2) the assessment of SD issues using SD integration instruments and tools within the University through the Total Management System (SGT); the implementation of consumption monitoring routines (namely, student participation in SD activities through collaboration in multiple social solidarity projects, and the disclosure of RS); and some best practices (namely the optimization of equipment and system schedules through the Centralized Technical Management System (SGTC) and the “Paper Calculator” software developed by the “Environmental Paper Network” [43] and GAS Porto—Oporto Social Action Group).

There seems to have been special care taken regarding the publication of RS by UP/FEUP between 2008 and 2011 and the integration of instruments and tools to assess SD issues.

Regarding the “outreach and collaboration” Dimension, the action related to the involvement of academic staff in voluntary advisory activities in SD seemed to be one of the initiatives.

The UP’s “institutional framework” demonstrates a commitment to the inclusion of SD in the vision and mission, goals and objectives of the University.

The extent to which UMinho and UP was able to integrate sustainability into their strategies or policies can be found through the actions organized in themes. From there, not only did these HEIs seem to have implemented sustainability internally through campus activities and on-campus experiences, but they also did it through outreach and collaboration (external routes). Both HEIs were committed to SD within their institutional framework and deeply involved in the assessment and reporting Dimensions.

3.4 The Universities’ commitments to SD without signing any DCI or RS

There were universities that had not signed any DCI or published any RS but were committed to SD and implemented sustainability actions.

Many HEIs used the Energetic Efficiency Program in Public Administration (Eco.AP) regarding energy efficiency in the “campus operations” Dimensions (which was the case of HEI_04, HEI_05, HEI_06, and HEI_08; see Table 10 and figure 6).

The implementation of “SD through on-campus experiences” was found in many of the studied universities, as well as other sustainability implementation actions such as policies that promote SD for all students and staff; in these areas, SD efforts are visible throughout the campus and some best practices were found (e.g., “knowledge sharing” and a “Cultural Training Program”).

Regarding “outreach and collaboration”, the actions found were: (1) SD partnerships with other society stakeholders (HEI_08 and HEI_13) and (2) Academic staff involved in voluntary advisory activities in SD (e.g. HEI_08).

One of the universities played a role in the environmental area with the creation of a Sustainable Campus that resulted from a partnership with GALP Energia (a Portuguese energy company) and others. Another initiative by this university involved the creation of synergies between sports and health, involving a Stadium in the promotion of common projects with schools (best practice). Moreover, another university had a role in the promotion of sports and adapted sports, like canoeing, sailing and adapted sailing, as well as in the creation of Research Centers / Associated Laboratories (hosting researchers from other universities).

Concerning the “education” Dimension, some HEIs created study programmes (e.g., Masters—Sustainable Energy, Environment and Sustainability, PhD—Sustainable Energy Systems, which was financed by the Massachusetts Institute of Technology (MIT) program in 2007 [65], Global Change (Climate Change and Sustainable Development Policies), Social Sustainability and Development) in areas such as energy, global change, sustainability, environment and sustainability, social sustainability and development, or a combination of these terms.

In one university, the gathering of professors from different faculties, departments and Research and Development (R&D units) was a path to promote interdisciplinary

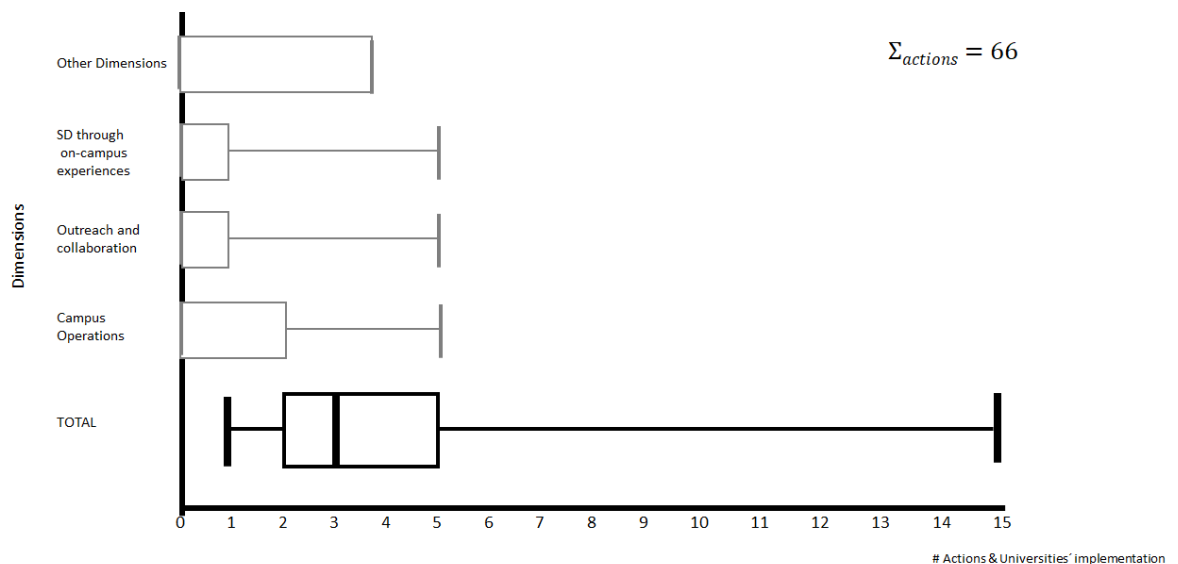
collaboration in teaching and development. This leverages talent and financial resources and creates awareness on sustainability issues, namely in the areas of energy and SD.

At one of the studied universities, the commencement of a doctoral program in the academic year 2010/2011, which is an interdepartmental program between two departments, is a good example of a university offering education with a transdisciplinary focus. The sustainability implementation action was evidenced by course syllabuses of courses or programmes on SD.

In the “research” Dimension, one university showed the existence of patents in the field of SD.

Towards a country profile for Portugal for the implementation of sustainability in Higher Education, on the basis of their likelihood in think thank (Figure 14) the sustainability implementation actions were classified according to the quartiles (see Figure 15) for the overall number, for the dimensions of campus operations, outreach and collaboration, and SD through on-campus experiences (the top three).

Figure 15 Box-plot: TOP 3 sustainability implementation actions in public Portuguese universities



- Group I correspond to first quartile (1 to 2 actions overall) including six universities;
- Group II correspond to second quartile (3 actions) including two universities;

- Group III correspond to third quartile (4 to 5 actions overall) including three universities; and
- Group IV correspond to fourth quartile (more than 5 actions overall) including three universities.

The Figure 15 Box-plot: TOP 3 sustainability implementation actions in public Portuguese universities is a box plot. Considering the top three Dimensions, first, second and third quartiles overlap. This means 75% of the Universities have taken this path to implement one or two sustainability actions. In the other dimensions, altogether, education and research, 4 actions were taken in 75% of the universities.

Universities seem to have integrated SD through multiple and simultaneous actions at their own rhythm and pace.

These findings show no apparent relationship with the number of students or campus area because the results followed all of the steps explained in Section 2.

4. Discussion

Many European universities have integrated SD into their academic systems. There are also important connections between commitment, integration and the signing of a DCI [2], relating to the leverage of values, attitudes, and behavior within present and future regenerative societies [21].

The results presented in this paper show that if a university signs a Declaration or a Charter, it seems to lead to a commitment to SD, however narrow it may be, partly through the implementation of several sustainability actions. This is the case of at least four Universities in Portugal (UP, UMinho, UNL and UTL). However, sustainability implementation is present in all the other studied universities.

During the DESD 2005–2014, the results show that Portuguese public Universities implemented sustainability through diverse and multiple actions, mostly by (i) establishing partnerships with other society stakeholders, (ii) implementing policies that promote SD

for all students and staff, (iii) signing DCIs within SD, ESD or sustainability during the UN Decade and also (iv) by promoting best practices.

Aleixo et al. (2018) and Arroyo et al. (2017) [66,67] refer not only the importance of putting into practice universities' transformative role in SD by including sustainability in an institution's agenda, strategies and best practices to promote said agenda, but also by the institution remaining engaged in the field despite facing the usual implementation problems varying from restricted resources to lack of trained staff [3], deficient organizational structure, inertia and resistance [66].

Based on the evidence of sustainability implementation actions, concrete proof for whether universities were committed to SD, a four-group classification was built to measure how far the policies and strategies were integrated. It shows that despite some universities having done more than others regarding the dimensions [2] all of them were engaged in SD implementation at their own pace. This is in line with published literature about Portuguese HEIs [66] that recommend a further development of sustainability initiatives for several Portuguese Universities.

More than 50% of the actions in Portuguese public universities are not exclusive to a single university. Also, the "Campus operations", "Outreach and collaboration" and "SD through on-campus experiences" dimensions represented about two thirds of the total sustainability implementation actions. Therefore, the way by which ESD has been integrated in Portuguese public universities within the United Nations Decade of Education for Sustainable Development 2005–2014 seems to have been a bottom-up approach. A university must have policies on SD which are in line with [18] when mentioning them as a pre-condition for successful sustainability efforts.

Sustainability Reports are a suitable tool for universities concerning SD incorporation, but this is not a common practice [1]. RS are a tool increasingly used by accreditation bodies, governments and students [68]. This seems to correspond to the presented findings, as UP and UMinho are the only two universities that produce RS.

RS have a large potential for the process of sustainability development integration in HE, namely for organizational change, stakeholder engagement processes in RS, link between RS and general sustainability management, and relationships between existing reporting indicators, tools, and management standards [69]. Thus, the development of RS at universities in Portugal should be widely encouraged. Aleixo et al. (2018) [67] mention that UMinho is in a SD implementation phase, due to university Sustainability Reports, and so this university seems to be an early adopter.

From this study's findings, best practices regarding green campus procedures were found in many of the studied universities. Indeed, campus operations are among the more commonly applied ESD domains in universities ([67,70, 71]. At this point, it should be said that the data used for this characterization can be underestimated and differences between institutions may be attributed to cataloguing methods, lack of documentation or a less systematic search where the terms (e.g., "green campus procedures") were not formally stated.

Regarding the "outreach and collaboration" Dimension, namely "partnerships with other civil stakeholders (e.g. NGOs, municipality, regional government, etc.)", many best practices were found in Portuguese public universities (e.g., UBI and UA) which seems to be not quite in line with [35] who reported that Portugal was far behind in externally oriented activities aimed at building capacity within local communities to promote SD.

Implementation actions relating to the "education" and "research" dimensions were not intensely found, which is in accordance with [6] that classified Portuguese universities as "laggards" and/or "late majority".

There may be significant advancements in the operational dimensions of a university, in curricular and educational transformation as well as in research and outreach activities [72], but in most cases, sustainability has not yet become an integral part of the university system [73].

Notwithstanding its improvement in recent years, the requested paradigm change from un-sustainability to sustainability in university systems is not yet fully identifiable [74].

Even so, Portuguese universities show good examples of sustainability interdisciplinary curricula, particularly at post-graduate level. The breadth and interconnectedness required for implementing the SDGs make it evident that experts from different subjects and sectors must work together to deliver the goals [16], as well as, that future research should concentrate on the challenge of measuring and assessing the differing conceptualizations of “sustainability” within curricular offer [69,75].

Many universities are already involved in sustainability through the curricula, training, research and community engagement activities [24]. This difference may be attributed either to the localization of public universities and/or the lack of documentation from some universities.

Communication is a core function of higher education [70]. In terms of ESD coordination and communication at the national level, it should be mentioned that there is an existing gap arising from the lack of ESD at governmental policy and strategy levels either by the Portuguese Government or the Ministry of public Universities [4,5].

Nevertheless, there has been effective coordination between universities regarding National and International programmes like Eco.AP and the MIT 2007 Program.

A detailed and deep content analysis of several documents, namely the Strategic and Activity plans, showed that, during the UN DESD 2005–2014, Portuguese public universities implemented sustainability actions in many different ways and Dimensions when compared with earlier studies.

Nevertheless, the initiatives found in each university were not integrated within a whole school approach [19]. A whole university approach for embedding sustainability in the university is fundamental for a transformation in learning and education for sustainability with interdisciplinary collaboration between academics. This is critical for promoting the needed transformation in students to become agents of a sustainable future [25, 70].

Usually in these types of studies where a profile of a region is drawn, data are gathered only by questionnaire or interview survey [76]. This systematic analysis of gathered

documental data was the basis for the characterization of a country profile for Portugal for ESD implementation in universities and allowed a detail analysis usually not possible through surveys, in which response´ rates are often low.

Based on the searched and identified actions, a think tank (a tank of actions) may be widened, and a cooperation network - SharingSustainability4U - established with a list of best practices and areas for sustainability improvement, irrespective of the university’s dimensions. Single universities may support and benefit from being a node in a university network for sustainability [77]. Collaboration and support among universities are key success factors as Universities have not implemented sustainability at the same pace, to the same extent and in the same Dimension(s). The Portuguese University Rectors Council can have a key role as mediator or even coordinator of this network.

5. Conclusions, Future Lines of Research and Limitations of the Study

5.1 Main Conclusions

During the United Nations Decade of Education for Sustainable Development 2005–2014, Portuguese public universities integrated sustainability into university policies and strategies mainly through “campus operations”, “outreach and collaboration” and “SD through on-campus experiences” Dimensions. Universities implemented sustainability through actions, many of which were not exclusive to only one university. One hundred and thirty-nine documents from fourteen universities were treated and analyzed to provide a better understanding of the progress regarding ESD implementation in Portuguese public universities and to find the main commitments and practices. The step by step treatment and systematic analysis of those documents helped to understand and value the possible sustainability implementation actions and university results on the strategies and policies of the public universities.

From this research, some important conclusions may be drawn:

1. As the largest number of codified references in public universities’ documents was about integration and environmental education, it might seem that universities were not sufficiently engaged in SD during UN DESD 2005–2014, compared to the terms sustainable

or sustainability which had few references. Nevertheless, at this point some sustainability implementation actions in public universities were found in the documentation. However, outcomes show that the movement has made progress at the university level, with good examples and initiatives in several Portuguese universities, notwithstanding the insufficiency of national combined strategies or policies related to ESD;

2. UN DESD 2005–2014 was not found to be, in itself, a common motivation for implementing University sustainability, as it is not one of the most well-found codified references in universities' documents. Nevertheless, the results show that Portuguese public Universities implemented sustainability through different and multiple actions whether under any DCI or not;

3. Universities' actions related to ESD seemed to have been taken in "isolation" and were not integrated according to a whole institution approach;

4. The implementation of ESD at public universities provides insights about (best) practices regarding green campus procedures which were found in many of the studied universities;

5. This study contributed to a country profile for the implementation of sustainability in the HE sector, highlighting the importance of analyzing the content of strategic and activity plans of HEIs. The information gathered by this systematic documental analysis is more thorough than that obtained through questionnaire surveys, a tool usually used in this kind of study.

The aims regarding the institutional document analysis from internal insights were accomplished.

5.2 Limitations of the Study and future Research

This study has some methodological limitations. For the relevant period (2005-2014), most universities published all documentation necessary for treatment and analysis. Nevertheless, in relation to some universities, and despite best efforts to obtain further documentation, either through websites or direct contact with staff and documentation

centers, it was confirmed that only a limited number of documents was actually published or made available.

To overcome this hindrance and complete and/or deepen the analysis, the investigation will be pursued through interviews with the persons in charge of Sustainability integration in each university to assess what has been done to implement ESD during DESD and what is being done at the present to propose strategies and policies for sustainability improvements and share them among all universities if possible. It is expected that a more complete country profile for Education for Sustainability Implementation will emerge.

Based on the country profile developed in this research each Portuguese university could share with all stakeholders (teaching staff, students, and community) all the initiatives and (best) practices in order to increase knowledge of the work that has been done, namely in terms of partnerships, fundraising and other actions of implementing sustainability. A platform - SharingSustainability4U - Sharing Sustainability Initiatives based on this partnership idea is suggested.

This may be widened to a European or even to a worldwide platform, as universities are not all at the same stage concerning ESD. In a near future, this platform could be a worldwide reference for all universities to share and communicate activities, projects and results of universities concerning ESD implementation. From here policies and strategies of several universities may be designed towards the implementation of ESD.

This study has some methodological limitations. For the relevant period (2005–2014), most universities published all the documentation necessary for treatment and analysis. Nevertheless, in relation to some universities, and despite best efforts to obtain further documentation either through websites or direct contact with staff and documentation centers, it was confirmed that only a limited number of documents were actually published or made available.

In order to overcome this hindrance and to complete and/or deepen the analysis, if possible, an investigation will be pursued through interviews with the persons in charge of Sustainability integration in each university to assess what has been done to implement

ESD during DESD and what is being done at the present to propose strategies and policies for sustainability improvements and to share them among all universities. It is expected that a more complete country profile for ESD Implementation will emerge.

Based on the country profile developed in this research, each Portuguese university could share with all stakeholders (teaching staff, students, and community) all the initiatives and (best) practices in order to increase knowledge of the work that has been done, namely in terms of partnerships, fundraising and other actions implementing sustainability. A platform—SharingSustainability4U—sharing sustainability initiatives based on this partnership idea is suggested.

This may be widened to a European or even to a worldwide platform, as universities are not all at the same stage concerning ESD. In the near future, this platform could be a worldwide reference for all universities to share and communicate activities, projects and results concerning their ESD implementation. From there, the policies and strategies of multiple universities may be designed towards the implementation of ESD.

References

1. Alonso-Almeida, M.M, Marimon, F.; Casani, F.; Rodriguez-Pomeda, J. Diffusion of Sustainability reporting in universities: Current situation and future perspectives. *J. Clean. Prod.*, 2014, 106, 144-154. DOI: 10.1016/j.jclepro.2014.02.008;
2. Lozano, R.; Ceulemans, K.; Alonso-Almeida, M.; Huisingh, D.; Lozano, F.; Waas, T.; Lambrechts, W.; Lukman, R.; Hugé, J. A review of commitment and implementation of sustainable development in higher education: results from worldwide survey. *J. Clean. Prod.*, 2015, 108, 1-18. DOI:10.1016/j.jclepro.2014.09.048;
3. Leal Filho, W.; Azeiteiro, U.; Alves, F.; Pace, P.; Mifsud, M.; Brandli, L.; Caeiro, S.; Disterheft, A. Reinvigorating the sustainable development research agenda: the role of the sustainable development goals (SDG). *Int. J. Sust. Develop. & W. Ecol.*, 2018, 25:2, 131-142. DOI:10.1080/13504509.2017.1342103;
4. Farinha, C., Azeiteiro, U.M., Caeiro, S. Education for Sustainable Development Through Policies and Strategies in the Public Portuguese Higher Education Institutions. In "Handbook of Theory and Practice of Sustainable Development in Higher Education" in the series "World Sustainability Development Series; Leal Filho, W.; Azeiteiro, U.; Alves, F. & P. Molthan-Hill (Eds.), Springer, Germany, 2017; pp. 275-290. DOI: 10.1007/978-3-319-47877-7_20;
5. Farinha, C.; Azeiteiro, U.; Caeiro, S. Education for sustainable development in Portuguese universities: the key actors' opinions. *Int. J. Sust. Hig. Ed.*, 2018, 19 (5), 912-941. DOI:10.1108/IJSHE-09-2017-0168;
6. Aleixo, A.M.; Azeiteiro, U.M.; Leal, S. Towards Sustainability through Higher Education: Sustainable Development Incorporation into Portuguese Higher Education Institutions. In "Challenges in Higher Education for Sustainability" in the series "Management and Industrial Engineering"; Davim, J.P., & Leal Filho, W.; Springer, Germany, 2016; pp. 159-187. DOI: 10.1007/978-3-319-23705-3_7;
7. Aleixo, A.M.; Azeiteiro, U.M.; Leal, S. UN Decade of Education for Sustainable Development: Perceptions of Higher Education Institution's Stakeholders. In "Handbook of

theory and Practise of Sustainable Development in Higher Education" in the series "World Sustainability Series"; Leal Filho,W.; Azeiteiro, U.; Alves, F. & Molthan-Hill, P. (Eds.), Springer, Germany: 2017; pp. 417-428. DOI: 10.1007/978-3-319-47877-7_28;

8. Leal Filho, W; Brandli, L.L.; Becker, D.; Skanavis, C.; Kounani, A.; Sardi, C.; Papaioannidou, D.; Paço, A.; Azeiteiro, U.M.; Sousa, L.de; Raath, S.; Pretorius, R.; Shiel, C.; Vargas, V.; Trencher, G.; Marans, R. Sustainable Development Policies as Indicators and Pre-Conditions for Sustainability Efforts at Universities: fact or fiction? *Int. J. Sust. Hig. Ed.*, 2017, 1-33;

9. Kapitulčinová, D.; AtKisson, A.; Perdue, J.; Will, M. Towards integrated sustainability in higher education: Mapping the use of the Accelerator toolset in all dimensions of university practice. *J. Clean. Prod.*, 2018, 4367-4382;

10. Association of University Leaders for a Sustainable Future (AULSF). Talloires Declaration Signatories List. Available online: <http://ulsf.org/96-2/#Portugal> (accessed on 3th September 2017);

11. COPERNICUS-CAMPUS. Copernicus Guidelines for Sustainable Development in the European Higher Education Area: How to incorporate the principles of sustainable development into the Bologna Process. Available online: http://www.ehea.info/media.ehea.info/file/COPERNICUS_Olderburg_2006/92/6/COPERNICUSGuidelines_587926.pdf (<http://ulsf.org/96-2/#Portugal> (accessed on 3th September 2017);

12. CRE (Conference of European Rectors). The University Charter for Sustainable Development [Carta Copernicus]. Available online: <https://www.iau-hesd.net/sites/default/files/documents/copernicus.pdf> (accessed on 3th September 2017);

13. United Nations. Higher Education Sustainable Initiative. Sustainable Development Knowledge Platform. Available online: <https://sustainabledevelopment.un.org/sdinaction/hesi> (accessed on 8th September 2017);

14. UNESCO. Aichi-Nagoya Declaration on Education for Sustainable Development. Available online: https://sustainabledevelopment.un.org/content/documents/5859Aichi-Nagoya_Declaration_EN.pdf (accessed on 10th July 2018);
15. McCowan. Universities and the post-2015 developments agenda: an analytical framework. *Hig. Ed.*, 2016, 72 (4), 505-523. DOI:10.1007/s10734-016-0035-7;
16. Anna-Diab, F.; Molinari, C. Interdisciplinarity: Practical approach to advancing education for sustainability and for the Sustainable Development Goals. *Int. J. Man. Ed.*, 2017, 15, 73-83.
17. Cicmil, S.; Gough, G.; Hills, S. Insights into responsible education for sustainable: The case of UWE, Bristol. *Int. J.Man.Ed.*, 2017, 15, 293-305;
18. UNESCO. United Nations Decade of Education for Sustainable Development (2005-2014). *Exploring Sustainable Development: A Multiple-Perspective Approach. Education for Sustainable Development in Action. Learning & Training Tools*, N. 3. Available online: <https://unesdoc.unesco.org/ark:/48223/pf0000215431> (accessed on 10th September 2017);
19. Soini, K; Jurgilevich, A.; Pietikainen, J.; Korhonen-Kurki, K. Universities responding to the call for sustainability: a typology of sustainability centres. *J. Clean. Prod.*, 2018, 170, 1423-1432;
20. Sonetti, G.; Brown, M.; Naboni, E. About the Triggering of UN Sustainable Development Goals and Regenerative Sustainability in Higher Education. *Sustainability* 2019, 11(254). DOI: 10.3390/su11010254;
21. Salvia, A.; Leal Filho, W.; Brandli, L.; Griebeler, J. Assessing research trends related to Sustainable Development Goals: local and global issues. *J. Clean. Prod.*, 2019, 208, 841-849. DOI: 10.1016/j.jclepro.2018.09.242 0959-6526;
22. European Union. Quality Education Is Essential for Development. Available online: <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P8-TA-2018-0075+0+DOC+XML+V0//EN> (accessed on 30th January 2019);

23. Pradhan, M.; Mariam, A. The Global Universities Partnership on Environment and Sustainability (GUPES): Networking of Higher Educational Institutions in Facilitating Implementation of the UN Decade of Education for Sustainable Development 2005–2014. *J. Ed. Sust. Devel.*, 2014, 8 (2), 171-175. DOI:10.1177/0973408214548383;
24. Leal Filho, W.; Raath, S.; Lazzarini, B., Vargas, V.R.; Souza, L.; Anholon, R.; Quelhas, O.L.G.; Haddad, R.; Klavins, M.; Orlovic, .L.. The role of transformation in learning and education for sustainability. *J. Clean. Prod.*, 2018a, 199, 286-295;
25. Casarejos, F.; Gustavson, L.; Frota, M. Higher Education Institutions in the United States: Commitment and coherency to sustainability vis-à-vis dimensions of the institutional environment. *J. Clean. Prod.*, 2017, 159, 74-84.
26. Goni, F.; Chofreh, A.; Mukhtar, M.; Sahran, S.; Shukor, S.; Klemes, J. Strategic alignment between sustainability and information systems: A case analysis in Malaysian public Higher Education Institutions. *J. Clean. Prod.*, 2017, 168, 263-270. DOI:10.1016/j.jclepro.2017.09.021;
27. Lotz-Sisitka, H. Stories of transformation. *J. Sust. Hig. Ed.*, 2004, N.1, 8-10;
28. Glover, A.; Peters, C. A whole sector approach: Education for Sustainable Development and Global Citizenship in Wales. In "Sustainability Assessment Tools in Higher Education Institutions: Mapping Trends and Good Practices around the World"; Caeiro, S. (Eds.), Springer International, Switzerland; 2013; pp. 205-222;
29. Dlouhá, J.; Glavic, P.; Barton, A. Higher Education in central European countries and critical factors for sustainability transition. *J. Clean. Prod.*, 2017, 151, 670-684.
30. Kościelniak, C. A consideration of the changing focus on the sustainable development in higher education in Poland. *J. Clean. Prod.*, 2014, 62, 114-119;
31. Jorge, M.; Madueño, J.; Cejas, M.; Peña, F. An approach to the implementation of sustainability practices in Spanish universities. *J. Clean. Prod.*, 2014. DOI: 10.1016/j.jclepro.2014.07.035;

32. Ramos, T.; Montaña, M.; Joanaz de Melo, J.; Souza, M.; Carvalho de Lemos, C.; Domingues, A.; Polido, A. Strategic Environmental Assessment in higher education: Portuguese and Brazilian cases. *J. Clean. Prod.*, 2015. DOI: 10.1016/j.jclepro.2014.12.088;
33. Heitor, M.; Horta, H. Reforming higher education in Portugal in times of uncertainty: the importance of illities, as non-functional requirements. *Techn. forec.& Soc. chang.*, 2015, 113, 146-156. DOI: 10.1016/j.techfore.2015.09.027;
34. Shiel, C.; Leal Filho, W.; Paço, A.; Brandli, L. Evaluating the engagement in universities in capacity building for sustainable development in local communities, *Eval. Prog.Plann.*, 2016, 123-134;
35. Universidade dos Açores (UAc). História. Available online: <http://novoportal.uac.pt/pt-pt/historia> (accessed on 27th May 2018);
36. Universidade do Minho (UMinho). Sustainability Report 2011. Available online: www.uminho.pt (accessed on 19th December 2015);
37. Universidade do Minho (UMinho). Sustainability Report 2012-2013. Available online: www.uminho.pt (accessed on 19th December 2015);
38. Universidade do Minho (UMinho). (2015). Homepage. Retrieved January 20, 2019, from www.uminho.pt;
39. Universidade Aberta (UAb). Activity Report 2013. Available online: www.uab.pt (accessed on 15th December 2015);
40. Universidade Aberta (UAb). Homepage. Available online: <http://portal.uab.pt/en/auab/> (accessed on 19th 2017);
41. Universidade do Porto (UP). Sustainability Report 2010. Available online: www.up.pt (accessed on 19th December 2015);
42. Universidade do Porto (UP). Environmental Paper Network. Available online: www.papercalculator.org (accessed on 19th December 2015);
43. Universidade de Trás os Montes and Alto Douro (UTAD). Homepage. Available online: <https://www.utad.pt/en/university/> (accessed on 23th April 2018);

44. Universidade de Évora (UÉ). Homepage. Available online: www.ue.pt (accessed on 23th January 2019);
45. Universidade de Évora (UÉ). General description of university. Available online: <http://www.en.mobilidade.uevora.pt/University/General-description-of-university> (accessed on 17h April 2018);
46. Universidade da Beira Interior (UBI). Activity and Account Plan 2011. Available online: www.ubi.pt (accessed on 11th October 2015);
47. Universidade da Beira Interior (UBI). Activity Plan 2013. Available online: www.ubi.pt (accessed on 29th October 2015);
48. Universidade da Beira Interior (UBI). (2016). Strategic Plan 2010-2020. Available online: www.ubi.pt (accessed on 15th October 2016);
49. Universidade da Beira Interior (UBI) History. Available online: www.ubi.pt/en/page/history (accessed on 22th December 2017);
50. Universidade de Coimbra (UC). Homepage. Available online: <http://www.uc.pt/en/international>: (accessed on 16th May 2018);
51. EfS [Energy for Sustainability Initiative]. Contribution for Institutional formation of University of Coimbra in interdisciplinary energy domain [Contribuição para a formação institucional da Universidade de Coimbra no domínio interdisciplinar da Energia]. Universidade de Coimbra: Coimbra, Portugal, 2011;
52. Universidade Nova de Lisboa (UNL). Home/Nova/History. Available online: <http://www.unl.pt/en/nova/history> (accessed on 19th May 2018);
53. Universidade de Aveiro (UA). Home page. Available online: <http://www.ua.pt> (accessed on 30th May 2018);
54. ISCTE-IUL. Home page. Available online: ISCTE-IUL: <https://www.iscte-iul.pt/> (accessed on 27th May 2017);

55. Universidade Católica Portuguesa (UCP). Institutional introduction. Available online: <http://www.ucp.pt/site/custom/template/ucptplportalpag.asp?sspageID=5&lang=2> (accessed on 27th May 2017);
56. CRUP. Quem somos? Available online: www.crup.pt (accessed on 27th May 2017);
57. CRUP. Estatuto Jurídico do Conselho de Reitores das Universidades Portuguesas. Available online: http://www.crup.pt/crup/sitecrup/wp-content/uploads/2016/10/Estatutos_Juridicos.pdf (accessed on 27th May 2017);
58. ULisboa. Action Plan 2014-2017: Proposal of the Rector to the General Council; ULisboa: Lisbon, Portugal, March 2014.5.8;
59. Bardin, L. Content analysis [Análise de conteúdo]; Edições 70: Portugal, Lisboa; 1977
60. Saunders, M.; Lewis, P.; Thornhill, A. Research Methods for Business Students (5th ed.); Prentice Education: England, Harlow, 2009;
61. Bryman. Social Research Methods (Vol. 4); University Press: England, Oxford, 2012;
62. QRS International. NVivo10 and NVivo 11. Available online: <https://www.qsrinternational.com/> (accessed on 8th October 2016);
63. Global Report Initiative (GRI). Information. Available online: <https://www.globalreporting.org/information/sustainability-reporting/Pages/default.aspx> (accessed on 19th November 2017);
64. MIT Portugal. Available online: www.mitportugal.org (accessed on 17th April 2017);
65. Aleixo, A.M.; Leal, S.; Azeiteiro, U.M. Conceptualizations of sustainability in Portuguese higher education: roles, barriers and challenges toward sustainability. *J. Clean. Prod.*, 2018, 172, 1664-1673. DOI: 10.1016/j.jclepro.2016.11.010;
66. Arroyo, P. A new taxonomy for examining the multi-role of campus sustainability assessments in organizational change. *J. Clean. Prod.*, 2017, 140, 1763-1774;
67. Stough, T.; Ceulemans, K.; Lambrechts, W.; Cappunyns, V. Assessing sustainability in higher education curricula: A critical reflection on validity issues, *J. Clean. Prod.*, 2018, 172, 4456-4466;

68. Ceulemans, K., Molderez, I., Liedekerke, L. V. Sustainability reporting in higher education: a comprehensive review of the recent literature and paths for further research, *J. Clean. Prod.*, 2015, 106, 127-143;
69. Kapitulčinová, D.; AtKisson, A.; Perdue, J.; Will, M. Towards integrated sustainability in higher education: Mapping the use of the Accelerator toolset in all dimensions of university practice. *J. Clean. Prod.*, 2018, 4367-4382;
70. Findler, F.; Schonherr, N.; Lozano, R.; Stacherl, B. Assessing the Impacts of Higher Education Institutions on Sustainable Development: An Analysis of Tools and Indicators. *Sustainability* 2019, 11 (59), pp. 1-19;
71. Zutsh, A.; Creed, A. Declaring Taillores: Profile of sustainability communications in Australia signatory universities. *J. Clean. Prod.*, 2018, 687-698. DOI: 10.1016/j.jclepro.2018.03.225;
72. Aleixo, A. M.; Azeiteiro, U.; Leal, S. The implementation of sustainability practices in Portuguese higher education institutions. *Int. J. Sust. High. Educat.*, 2017a, 19 (1), 146-178;
73. Kahle, J.; Risch, K.; Wanke, A. Strategic Networking for Sustainability: Lessons Learned from Two Case Studies in Higher Education. *Sustainability* 2018, 10 (4646), 1-24. DOI: 10.3390/su10124646.

CHAPTER 4

Universities speak up regarding the implementation of sustainable development challenges: the case of Portugal

References: Farinha, C., Caeiro, S. and Azeiteiro, U. (2020), "Universities speak up regarding the implementation of sustainable development challenges: The case of Portugal", *International Journal of Sustainability in Higher Education*, 21 (3), 465-506.

Available at: <https://doi.org/10.1108/IJSHE-08-2019-0250>

Abstract

Purpose – This study aims to expand knowledge and provide further insights on how education for sustainable development (ESD) has been integrated into programmes at higher education institutions (HEIs) in Portugal.

Design/methodology/approach – A questionnaire survey was given to key actors in charge of sustainability implementation at each Portuguese public university. Semi-structured interviews were also conducted with 13 of the survey respondents and the data were analyzed.

Findings – Results showed that Portuguese public universities have their own strategies and policies on ESD, leading them to introduce initiatives arising from their proactiveness rather than governmental edicts. Some universities implemented ESD planning and beneficial “green” practices such as waste separation and recycling and ways to reduce energy consumption that can be a result of the improvement after the United Nations Decade 2005-2014. However, these actions seem to have been taken in isolation and not holistically integrated. Universities face many barriers including lack of funding, not properly trained people and inept government policies. They also must overcome challenges in implementing ESD.

Research limitations/implications – This research into the implementation of ESD has a national scope; the findings should be interpreted only in a Portuguese university context despite the high number of interviewees.

Practical Implications – The study has increased knowledge, provided further insights on how ESD has been integrated at HEIs and provided examples of integrated practices at

Portuguese universities. A Sustainability4U platform was proposed for enhancing awareness of the need for increasing sustainable development.

Originality/value – This study contributes to defining a country’s profile and how to implement sustainability in HEIs. The importance of obtaining information from key actors in sustainability at Portuguese public universities was highlighted.

Keywords – Education for sustainable development (ESD), Higher education institutions, Whole institution approach, Portugal, Universities, Higher Education Institutions, Whole school approach, Portugal, Universities.

Paper type Research paper

The authors wish to thank all interviewees for sharing their valuable but necessarily different experiences concerning ESD implementation.

The authors also thank the Portuguese Science and Technology Foundation (FCT) for its funding (UID/AMB/04085/2019) to the Centre for Environmental and Sustainability Research (CENSE), NOVA School of Science and Technology, NOVA University of Lisbon.

1. Introduction¹⁷

Since the Brundtland Report (WCED, 1987), much research has been focused on how sustainable development (SD) can be a process for change in which societies improve the quality of life of their people, by achieving a dynamic equilibrium between the economic and social aspects, while protecting and improving the natural environment (Lozano, 2003). Since the United Nations (UN) Decade of Education for Sustainable Development (DESD) (2005-2014) (UNESCO, 2005), investigation has emphasized the implementation of SD in higher education institutions (HEIs) such as universities (Lozano et al., 2015; Leal Filho et al., 2018; Kapitulčinová et al., 2018).

¹⁷ See annexed data on this Chapter #4 in Appendices A, B.2 and C.3.

Concerning the key factors of embedding sustainability in universities, Adams (2013) considers it important to have:

- a proactive senior leadership;
- a clear communication strategy which encompasses social media;
- inclusion of sustainability in overall university strategies and plans;
- mechanisms to facilitate multi-disciplinary research and course development;
- opportunities for students and staff engagement;
- other initiatives that develop engagement in sustainability practices; and
- celebration of successes.

It may be almost impossible to target all of these goals in the first stages of incorporating SD into a university's system, but a start may be made by selecting a few to focus on initially (Lozano, 2006).

Universities can implement education for sustainable development (ESD) in different dimensions, preferably according to a holistic approach. Ideally, this implementation should be based on a holistic/integrated approach which the United Nations Educational, Scientific and Cultural Organization calls the "whole-institution approach" (UNESCO, 2005, 2012). While recognizing their leadership role, the member states' task is also defined by the four major thrusts of ESD: (1) improving access to quality basic education, (2) reorienting existing education programmes, (3) developing public understanding and awareness, and (4) providing training.

According to UNESCO (2005a), at the national level, the objectives of an integrated approach to the DESD from government ministries involve: (a) declaring ESD as a priority where it is possible to incorporate national SD plans and education plans, (b) aligning policy, mandates, and other frameworks to support ESD, (c) understanding ESD, (d) assisting educators and trainers with the relevant knowledge and information to address ESD, (e)

promoting research and development for ESD, and (f) building cooperative networks of human and financial capital (that happened in the UK's case (Vargas et al., 2019)).

Lozano (2006) considered that the concepts of SD should ideally be integrated into the policies, approaches and learning of all university stakeholders, including academic directors, professors and students. At the global level, Lozano et al. (2015) performed a worldwide survey of the commitment and implementation of SD in higher education (HE). Around 80 per cent of the responses were from European HEIs, and most of the professionals that answered the survey came from a network of colleagues interested in implementing SD throughout their HEIs. This study revealed the global trend but details of the plans in each European country were missing.

SD, as a global normative development concept and as defined by the 2030 Agenda and its sustainable development goals (SDGs), adds another level of complexity (Spangenberg, 2018).

Many European countries are prominent in the world education rankings and many have already met the SDG targets (Sachs et al., 2017). However, on average, the European continent still ranks behind countries such as South Korea, Japan and the USA (Salvia et al., 2019), and it is still in pursuit of the goal of educational equality (European Union, 2016).

As universities are committed to the attainment of the SDGs, they should place their mission's core. The essence of SD must be introduced into the students' curricula (Lopez et al., 2019). Some European universities may have embedded sustainability into their academic systems in response to top management commitment to SD following the signing of the University Charter for Sustainable Development, known as the Copernicus Charter (Conference of European Rectors [CRE], 1994) and/or the Talloires Declaration (Association of University Leaders for a Sustainable Future [AULSF], 1990). However, there are some HEIs that have implemented sustainability without such a formal commitment. In northern and western European countries, such as Sweden and Wales (Lotz-Sisitka, 2004; Glover & Peters, 2013), good practices are already being implemented following this movement, but

in southern European countries such as Portugal, the governmental driving forces are still non-existent (Farinha et al., 2018).

Earlier research analyzing plans and reports from 2005 and 2014 showed that Portuguese universities' autonomy and social responsibility led them to develop several timely initiatives and policies towards ESD (a bottom-up approach) and examples of practices for sustainability implementation were found (Farinha et al., 2019). Blasco et al. (2019), in a study that was carried out in 40 per cent of public universities in Spain between 2014 and 2016, concluded that including sustainability practices in strategic planning can enhance academic and research performance.

Portuguese institutions, however, seem to have been implementing ESD in isolation from each other, at their own pace and without governmental guidelines. With the exception of some actions concerning outreach and collaboration, research and education, these initiatives were not holistically integrated or conducted according to a whole institution approach (UNESCO, 2012; Farinha et al., 2019). Over the past decade, Portugal suffered severe economic and political constraints which might explain the lack of governmental policies, even though this appears to be a phenomenon common in other countries (Leal Filho et al., 2015).

On a national scale, Aleixo et al. (2018) studied the perceptions of rectors, senior management and other middle management staff at Portuguese HEIs, in both universities and polytechnics, regarding the conceptualization of sustainable HEIs, and their roles, barriers and challenges. In addition, in a geographical and sociocultural context comparable to this research, Jorge et al. (2015) studied intermediate administrative perceptions of the application of sustainability practices in Spanish universities.

This study's purpose is to expand given knowledge and provide further insights into how ESD has been integrated at HEIs in Portugal, through a questionnaire survey that was sent to key actors in charge of sustainability implementation at each Portuguese public university.

Another important aim was to define what challenges universities face and the future directions necessary to overcome them. This study ranged from the UN DESD 2005-2014 to the present time (2018).

The research questions to the university leaders in charge of sustainability implementation were:

RQ1. How was ESD incorporated into the university's policies, campus operations, education, research, outreach and collaboration, on-campus experiences and assessment and reporting from UN DESD 2005-2014 until now?

RQ2. What are the barriers and the challenges to ensuring that ESD becomes an integral part of the university culture and may create a multiplier effect within the institution during UN DESD 2005-2014 as well as in the short and long terms?

This study contributes to a new definition of a country profile and how to move ahead for the implementation of sustainability in the HE sector, highlighting the importance of obtaining information from the key actors in charge of sustainability implementation at Portuguese public universities. This may be helpful to understand the extent to which ESD may or may not be applied in the policies and strategies of other European HEIs, as well as to share some universities' practices either for governance or projects. A Sustainability4U platform is a solution suggested as a follow-up of the results of this study and it is proposed for enhancing awareness to increase SD. Its aim is to enlarge the knowledge and share of good, integrated practices in Portuguese HEIs, with the view to advancing towards the educational level attained in Europe.

2. Methods

2.1 Nature of the study

This study followed a qualitative approach, with semi-structured interviews (Bryman, 2012) with each key actor in charge of sustainability implementation at each institution to determine how each university has implemented ESD into its policies and strategies within the framework and goals of the UN DESD 2005-2014 up to the present time (2018). The actors were defined and selected through contacts made by the rectorate towards the

most suitable person in charge of sustainability. The aim was to determine not only the extent to which ESD was embedded in each HEI but also SD commitments, actions, practices, barriers and the challenges ahead.

Interviews are an extremely flexible research tool that may be used at any stage of the research process to identify areas that need further detail. In the case of semi-structured interviews, not only is there a constant flow of communication, avoiding disjointed question-asking, but also the interviewee appears to have more to say (Brewerton & Milward, 2001).

2.2 Development of the interview script

An exploratory literature review was undertaken to identify ESD implementation efforts throughout the HEI system. The review was then used to develop the interview script used in this research:

- the HEI system proposed by Lozano et al. (2015), which is linked to the seven topics of the recognised university system, also known as dimensions;
- Sustainability Assessment Questionnaire (SAQ) (University Leaders for a Sustainable Future (USFL, 2018);
- questionnaire used to analyse perceptions of leaders of Portuguese universities and polytechnics in relation to ESD initiatives, projects and practices implemented in their institutions (Aleixo et al., 2017); and
- a literature review of relevant published research and questionnaires during the period 2005-2015 within the main leading journals on higher education for sustainable development (HESD) concerning the main challenges and drivers for ESD in HEIs.

Agreement about the suitable dimensions for ESD implementation in the university system is still not unanimous, as it varies according to the authors and the methods used.

For international universities, Calder & Clugston (2003) mentioned that many will focus their mission on SD by making sustainability central to the critical dimensions: curriculum, research and scholarship, operations, community outreach, partnerships, service, student opportunities and institutional mission and structure. The proposal of Lozano et al. (2015) is entirely dedicated to the HE sector and so was deemed more appropriate for this study's aims. The seven dimensions comprise:

- (1) institutional framework;
- (2) campus operations;
- (3) education;
- (4) research;
- (5) outreach and collaboration;
- (6) SD through on-campus experiences; and
- (7) assessment and reporting.

The SAQ for colleges and universities is a qualitative questionnaire, designed to help assess the extent to which the college or university is sustainable in critical areas of HE such as teaching, research, operations and outreach (USFL, 2018). It aims to:

- raise awareness and encourage debate about what sustainability means for HE practically and philosophically;
- provide a snapshot of the state of sustainability on campus; and
- promote discussion on the next steps for the institution.

A review of the key papers published during the period of the DESD (2005-2014) in the leading journals on HESD, including the Journal of Cleaner Production, the International Sustainable development challenges Journal of Sustainability in Higher Education and Higher Education Policy, was carried out to determine the main barriers and drivers for integrating SD in HEIs. To organise the research questions for the interview script, suggestions were solicited from a variety of authors who studied these matters (Velazquez

et al., 2005; Ferrer-Balas et al., 2008; Lozano, 2008, 2010; Leal Filho, 2011; Barth & Rieckmann, 2013; Jorge et al., 2015; Verhulst and Lambrechts, 2015).

The interview script was limited to the seven dimensions of the HEI system proposed by Lozano et al. (2015) to have a comparison base, regional vs worldwide. The interview script (Appendix B.2) was divided into three sections:

- (1) characteristics of the HEI such as geographical area (Nomenclature of Territorial Units for Statistical Purposes - II), number of students and campus area;
- (2) recognised university system, including the seven dimensions proposed by Lozano et al. (2015); and
- (3) barriers during UN DESD 2005-2014, and challenges to ensure sustainability implementation in the short and long terms.

The survey comprised 100 close-ended questions, complemented by 3 open questions. Interviewees were offered the opportunity to comment or provide examples of SD initiatives or additional information. Most of the close-ended questions used a five-point Likert scale, whose objective was to measure the extent of subject's agreement with each item: strongly agree, agree, undecided, disagree and strongly disagree (McNabb, 2015). Five-point scales are the most commonly used (Saunders et al., 2009). The items are assigned values running from 1 to 5, with 1 being strongly agree and 5 being strongly disagree. According to Bourque & Clark (1992), the benefits of the Likert scale include parsimony, minimal overlap with other constructs under study, high validity and reliability, unidimensionality and known dimensionality.

The open questions in the interview script, according to Saunders et al. (2009), encourage the interviewees to provide extensive and developmental answers and to reply as they wish.

The interviewees were asked to answer the questions for the timeframes of the UN DESD and of 2018 onwards, to allow a comparison between both periods.

Interview scripts were pre-tested by PhD students and university professors, and small changes were introduced based on their suggestions.

The limitations associated with interviewing, such as validity, reliability and generalizability, and those associated with participant and observer error and bias (Saunders et al., 2009) were considered in the discussion of results (Section 4.3) and when drawing conclusions (Section 5).

2.3 Target group

The target group comprised all the public university higher education institutions (UHEIs) in Portugal, as the aim is not to rank universities, but to contribute to the definition of a country profile describing ESD implementation in universities.

There are 14 public universities in Portugal and the interviewees were HEIs' key actors involved in the decision-making policies regarding sustainability. They were chosen because they may provide a better understanding of the commitments concerning ESD implementation in Portuguese public universities, as well as their impact on HEI strategies. The interviewees were first contacted via email to schedule an interview to discuss their public university implementation. Access to the individuals was facilitated by personal or professional contacts from research centres related to sustainability in Portugal. All but 1 of the 14 university officials were interviewed (Table 12).

Table 12 Interview characteristics (first contact, date, mode, length and number of requests)

University/Faculty code	First contact (mail sending)	Date	Interview mode	Interview duration	number of requests	number of days between first contact and the interview date
HEI_1	27/04/2018	07/05/2018	face-to-face	02:00	0	10
HEI_2	27/4/2018	09/05/2018	face-to-face	01:30	0	12
HEI_3	27/4/2018	15/05/2018	zoom	02:28	0	18
HEI_4	27/4/2018	11/06/2018	face-to-face	02:18	3	45
HEI_5	2/5/2018	04/06/2018	face-to-face	01:30	3	33
HEI_6	2/5/2018	20/06/2018	hangout	02:20	7	49
HEI_7	2/5/2018	02/07/2018	face-to-face	02:20	5	61
HEI_8	7/5/2018	17/05/2018	face-to-face	01:41	0	10
HEI_9	7/5/2018	18/05/2018	face-to-face	01:28	0	11
HEI_10	7/5/2018	23/05/2018	skype	01:37	3	16
HEI_11	7/5/2018	11/06/2018	face-to-face	02:40	3	35
HEI_12	7/5/2018	18/06/2018	skype	02:18	5	42
HEI_13	1/6/2018	18/07/2018	skype & telephone	02:59	6	47
HEI_14	7/5/2018	na	na	na	5	na
na - not applicable						

2.4 Data Collection

Interviews were conducted between April and July 2018. All of them were audio recorded and transcribed with the permission of the interviewees, with the exception of one. The objective was for all respondents to be aware of the information collected (Fortin et al., 2009).

Confidentiality was ensured by allocating an alphanumeric identification to each interviewee (HEI_1-HEI_14), so that their names and the respective institution did not appear in the publication findings or results.

The preferred mode of interview was face-to-face (almost 2/3), in a comfortable place determined by the interviewee (Table 12). When a face-to-face interview was not possible, the interview was conducted through Skype, Hangout or Zoom. There was one case of a Skype and telephone interview in which the mobile telephone was used to complement a previous face-to-face interview.

The median length of the interviews was 2 h and 18 min (ranging from 1 h and 28 min to 2 h and 59 min) and there was a maximum of seven requests to schedule an interview. The median number of requests was three, considering that there was a real need to get as much information as possible from each HEI. In three occasions, there was more than one interviewee per university with other types of background and/or knowledge, which enriched the interviews providing better data. Overall, the 13 interviews correspond to almost a 0.75 full time equivalent¹⁸ (26 h and 24 min) for a 35-h work week. In the case of five HEIs, there was no need to make any request. The key actors answered without delay after having received an email. Statistical analysis of the interview length with the number of requests gave a correlation coefficient of 0.57, which demonstrates a moderate uphill (positive) relationship between the interview length and the number of requests. Overall, as soon as the key actor was available to be interviewed, the questions were answered thoroughly once the interview started. However, a longer interview does not necessarily provide more reliable data.

¹⁸ The ratio of the total number of paid hours during a period (part time, full time and contracted) by the number of working hours in that period Mondays to Fridays.

2.5 Data treatment and analysis

All the interviews were transcribed, treated and analyzed in a coding system, according to a qualitative approach. To obtain a more reliable database, the preliminary data were sent to all the interviewees for validation. Three quarters of the interviewees used the validation process to provide additional information.

The data were analyzed by a combination of descriptive statistics and extreme balance answers (EBAs). The descriptive statistics of the Likert-based questions provided a description of the key variables of the investigation (Jupp, 2006) (see Appendix B.2 – Questions 2.2-2.7) and a preliminary analysis. According to Tastle & Wierman (2007), the frequency distributions were converted to percentages to provide a standardized way to compare between and among the categories.

The descriptive analysis was performed using the Statistical Package for the Social Sciences software, version 24 (IBM SPSS 24, 2018) and was complemented with examples of ESD implementation actions from the close-ended questions. This was applied to Section 2.1 of the interview script (Appendix B.2). This analysis was used not only for its understanding but also because it allows comparisons with other studies, such as Lozano et al. (2015).

The other method used in data analysis was EBA (Zilhão et al., 2008) that is defined as the difference between the share of positive evaluation responses ('totally agree' and 'agree') and negative evaluation responses ('disagree' and 'totally disagree'). The method transforms one scale into another (using different weights) between -1 or +1, where values close to -1 mean full disagreement and values near +1 mean full agreement. This method is used in OECD countries in many qualitative surveys and the changes in the percentages of replies can be interpreted as indicating changes in the degree of uncertainty among respondents (OECD, 2003). The transformation of the scales of response into this new simple scale is done by giving different weights to the relative frequencies to each answer value:

$$EBA = [(\% \text{ answers}(5) * 1.0 + \% \text{ answers}(4) * 0.5) - (\% \text{ answers}(2) * 0.5 + \% \text{ answers}(1) * 1.0)]$$

The responses were aggregated into "agree" and "disagree" to facilitate their interpretation.

$$EBA = \% \text{ answers}(+) + \% \text{ answers}(-)$$

Analysis can be made by groups of questions or by dimensions. Only question 3.1 from the interview script (Appendix B.2), namely, “Barriers to the SD implementation that influence strategies in UHEI” was treated and analyzed through EBA. This was the chosen method to analyze the barriers during the UN DESD.

The last section of the interview script, questions 3.2.1, 3.2.2 and 3.2.4 in Appendix B.2, was the only part of the interview with open questions. After the treatment and analysis of the data collected, it was possible to organize the interviewees’ answers into categories to better understand the challenges and to ensure sustainability implementation in both short and long terms.

3. Results and findings

3.1 Recognized University System

Of the 13 interviewees, only two recognized that their institution had signed the Copernicus Charter (see Appendix B.2, section 2, question 0).

Some sustainability HEIs’ key actors mentioned that their universities had signed other initiatives concerning ESD within DESD 2005-2014 besides the Copernicus Charter:

- UN Academic Impact, whose goal is to make an association between HEIs and UN Millennium Development Goals¹⁹ (educational activities, research and social responsibility) (one HEI);
- Environmental Association of Universities and Colleges (one HEI); and
- Columbus Consortium (two HEIs).

However, other interviewees admitted that they did not know about the charter or its signing, which they attributed to their recent responsibility for the role or for not being the

¹⁹ After 2015, MDG were replaced by SDG – Sustainable Development Goals.

right person to answer that precise question. Because many interviewees were unaware that anyone from their institution had signed a DCI, this suggests a lack of communication among the different people in the top hierarchy and throughout the university.

3.1.1 SD implementation regarding Dimensions

The answers about SD implementation within the institutional framework included elements such as: HEI SD in vision and mission, goals and objectives, SD policies, SD strategic plans, staff members dedicated to SD, SD working group, office supporting SD implementation within the institution, budget for SD initiatives or any kind of support and dissemination procedures.

During the DESD 2005-2014, interviewees referred to “staff engagement” (Appendix B.2, Question 2.1.4) as the most prominent element, followed by the existence of a “SD working group” (Appendix B.2, Question 2.1.5; Figure 16). This situation is not so noticeable in 2018, where almost all the elements demonstrate a clear university commitment.

Some aspects seemed to be more evident when the interviewees were asked about SD implementation in 2018, such as:

- the existence of a strategic plan for SD in their university (Appendix B.2, Question 2.1.3);
- the inclusion of sustainability in its mission, vision and goals (Appendix B.2, Question 2.1.1); and
- the existence of a policy for implementing SD (Appendix B.2, Question 2.1.2; Figure 17).

These latter elements showed that HEIs have incorporated SD either explicitly written or explicitly mentioned as environmental or social issues into their institutional framework and this indicated a greater official commitment to SD in 2018 than in the DESD. Nevertheless, interviewees recognized that there were fewer SD offices in HEIs Appendix

B.2, Question 2.1.6) than there needed to be, and a greater effort should be made to create more. There was only one exception in which there had been a pro-rector for sustainability since 2010 in one HEI, whose cabinet was part of the pro-rectorate.

Another key factor in sustainability implementation seems to be budgets for SD initiatives (Appendix B.2, Question 2.1.8). In contrast, the Questions and Answers (also known as FAQ – frequently asked questions or Q&A) procedures regarding SD (Appendix B.2, Question 2.1.7) are obviously not considered as important.

Figure 16 Interviewees answers about the institutional framework during UN Decade 2005-2014

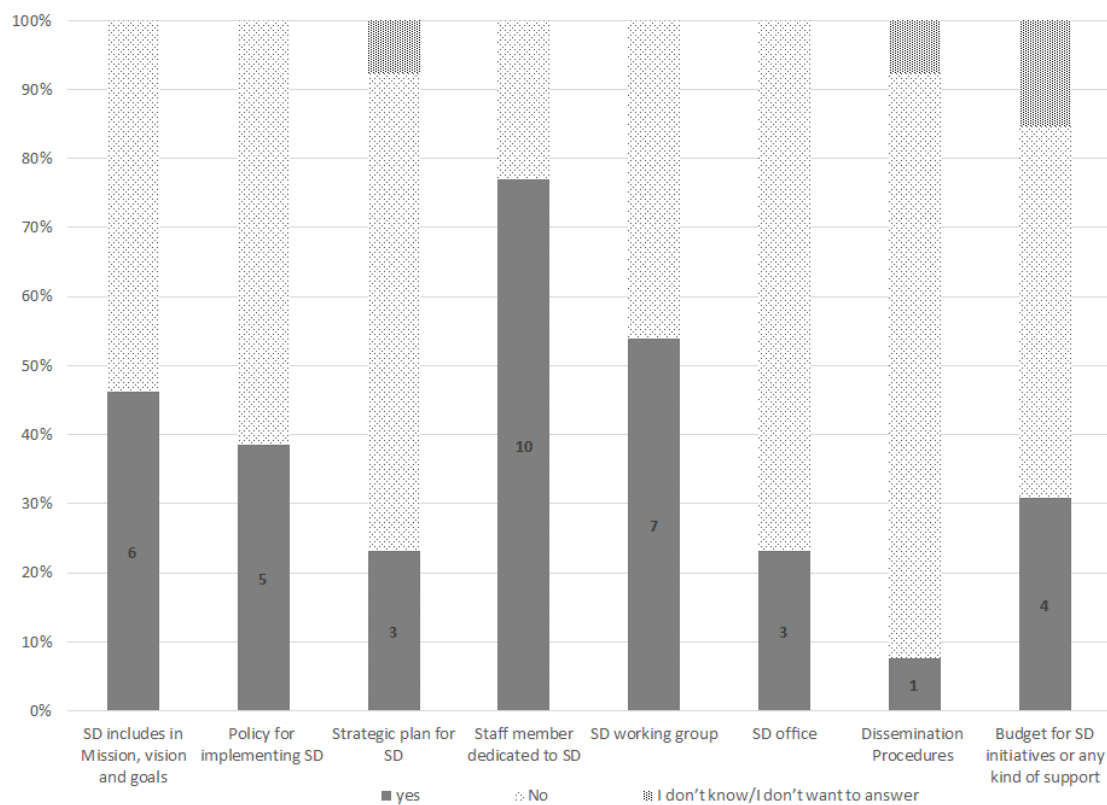
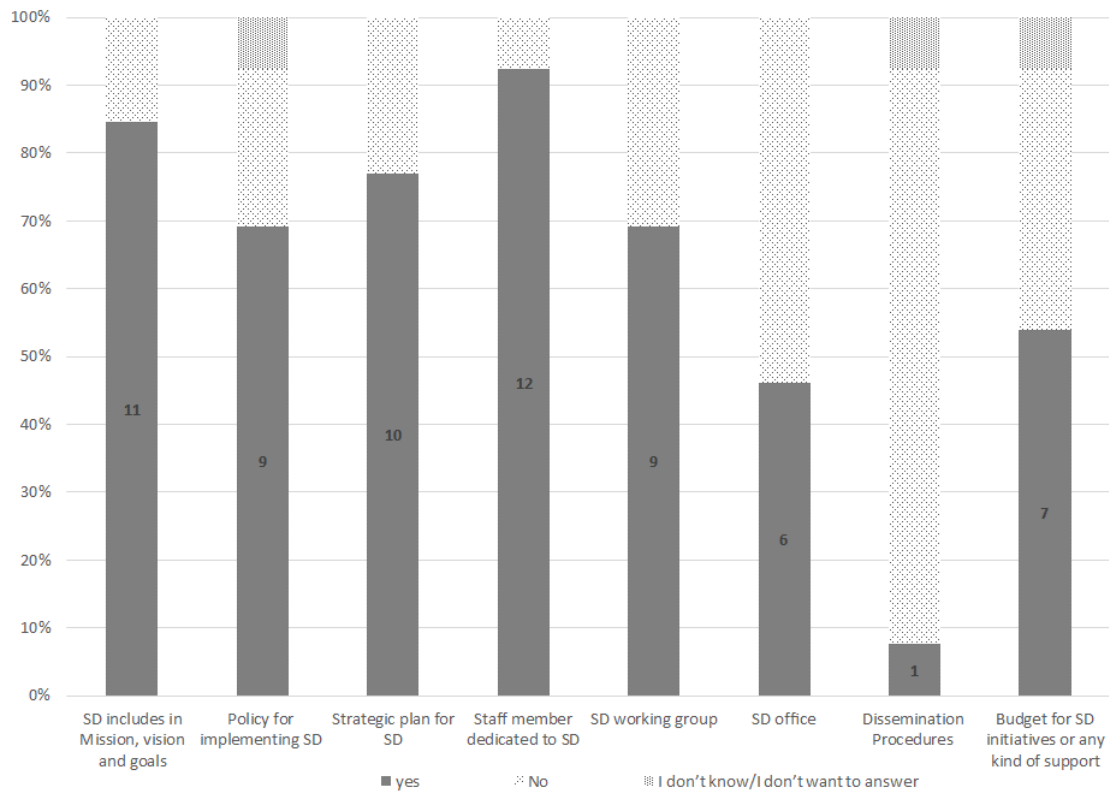


Figure 17 Interviewees answers about the institutional framework in 2018



For 2018, in the interviewees’ opinion, sustainability is “explicitly mentioned as environmental or social issues” through mission, vision, goals and policies; however, only 38 per cent of the universities have a SD office (Table 13).

Table 13 Interviewees’ opinions concerning “explicitly written” positive answers and “explicitly mentioned as environmental or social issues” positive answers

elements \ interviewees’ answers	YES (explicitly written)		YES (explicitly mentioned as environmental or social issues)		No		I don't know/I don't want to answer	
	Universities (2005-2014)	Universities (at present time)	Universities (2005-2014)	Universities (at present time)	Universities (2005-2014)	Universities (at present time)	Universities (2005-2014)	Universities (at present time)
SD includes in Mission, vision and goals	23%	15%	23%	69%	54%	15%	0%	0%
Policy for implementing SD	23%	8%	15%	62%	62%	23%	0%	8%
SD office	8%	8%	15%	38%	77%	54%	0%	0%

The six actions most recognized by interviewees for the implementation of SD in campus operations during the DESD 2005-2014 were:

- (1) energy efficiency equipment;
- (2) waste bins for separation;
- (3) waste bins for recycling;
- (4) improvement of energy efficiency;
- (5) access and facilities for disabled people; and
- (6) activities to reduce paper consumption (Figure 18).

For 2018, there was not much change in the top six. However, in the interviewees' opinions, the implementation of SD actions in campus operations widened the scope as equality and diversity ((Figure 18) or water management were introduced. The "promotion of sustainable modes of transport" had a major impact on the implementation of SD in campus operations according to the interviewees in 2018.

The actions least recognized by the respondents are shown in Figure 18 ("green purchasing from environmentally and socially responsible companies" and "promotion of fair-trade products", in descending order).

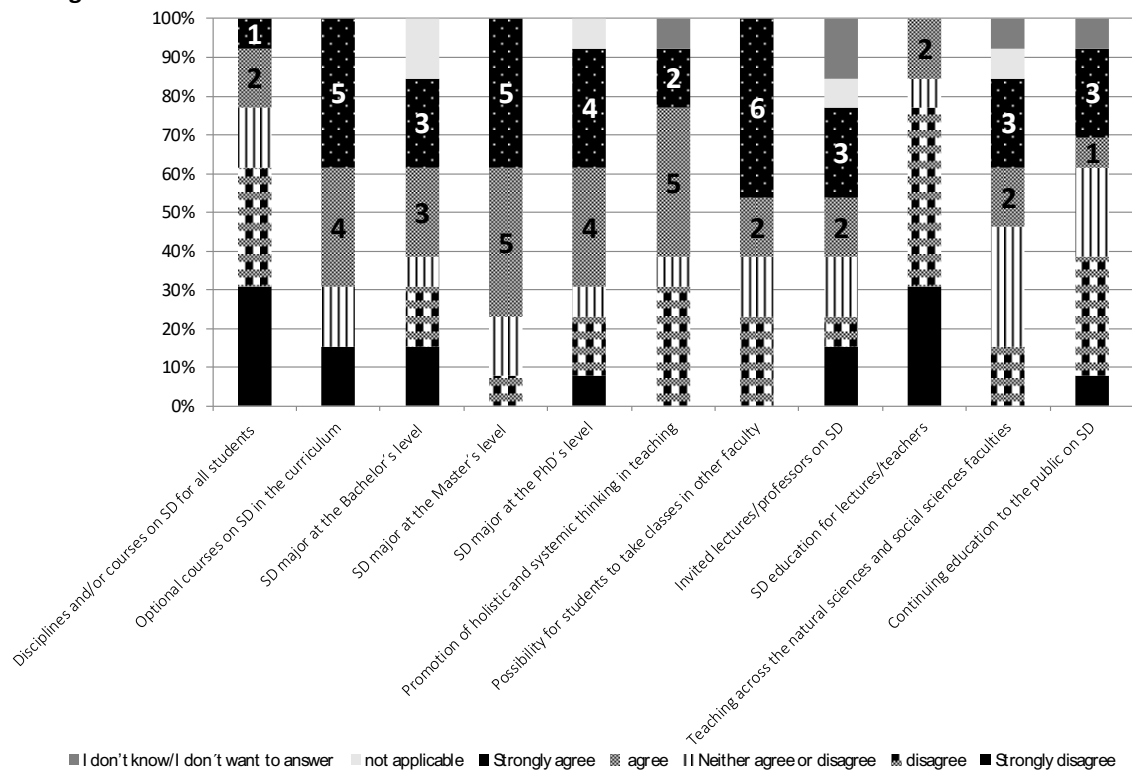
Figure 18 Interviewees opinions about implementation of SD in campus operations during the UN Decade 2005-2014 vis à vis 2018



The most frequent (>70 per cent) actions implementing SD in education during the DESD 2005-2014 were:

- offering an SD major at the level of master's, PhD or bachelor's;
- optional courses on SD in the curriculum;
- the possibility of taking classes with a different faculty member or in another school;
- and
- the promotion of holistic and systemic thinking in teaching (Figure 19).

Figure 19 Interviewees' opinions about the implementation of sustainable development in education during the UN Decade 2005-2014

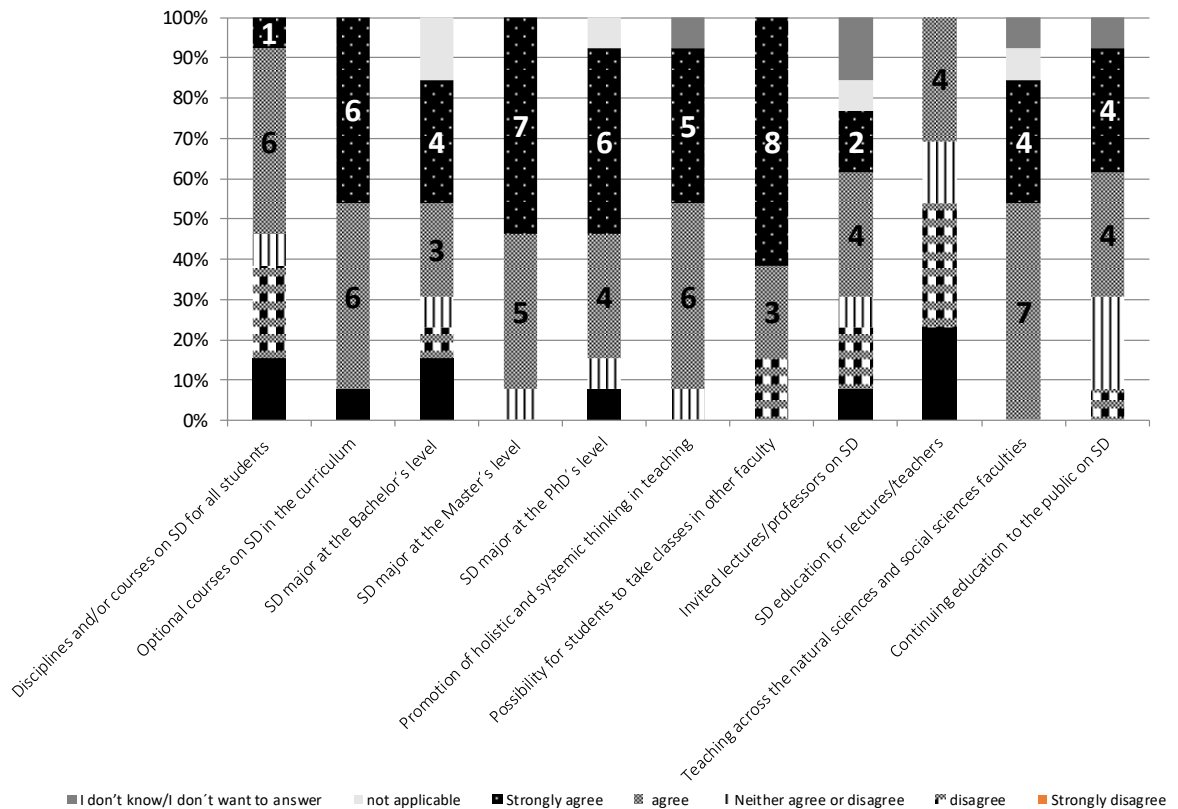


The examples that were given by the key actors involved PhD and MSc courses in sustainable energy systems, climate change and sustainable social development.

SD integration into the education process in 2018 has been reinforced, while other actions increased (Figure 20). The interviewees emphasized that actions on education that were

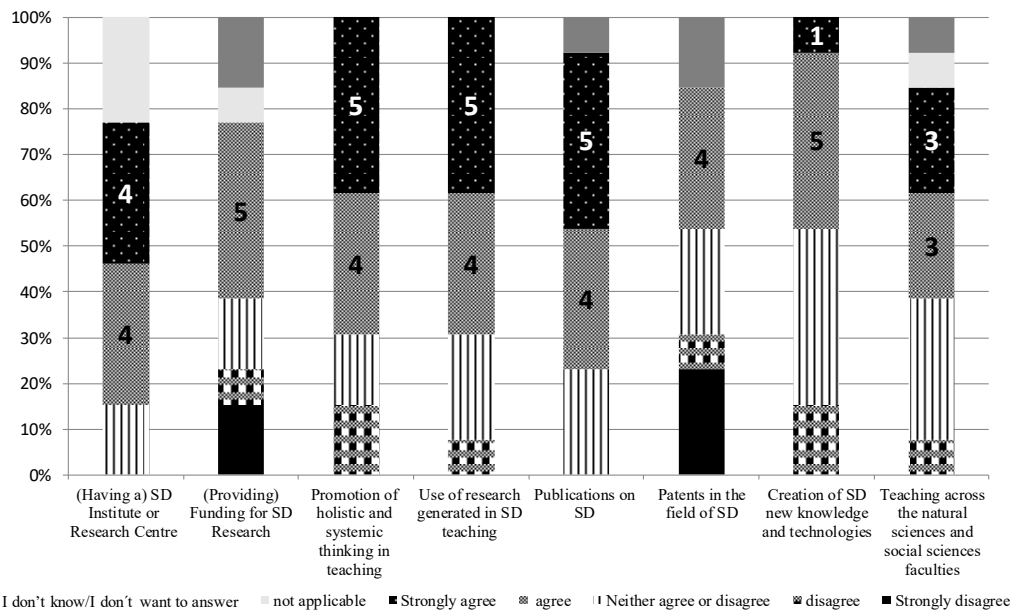
not applied in implementing SD included inviting lecturers on SD and providing ESD for lecturers and teachers (staff training programmes).

Figure 20 Interviewees' opinions about the implementation of sustainable development in education in 2018



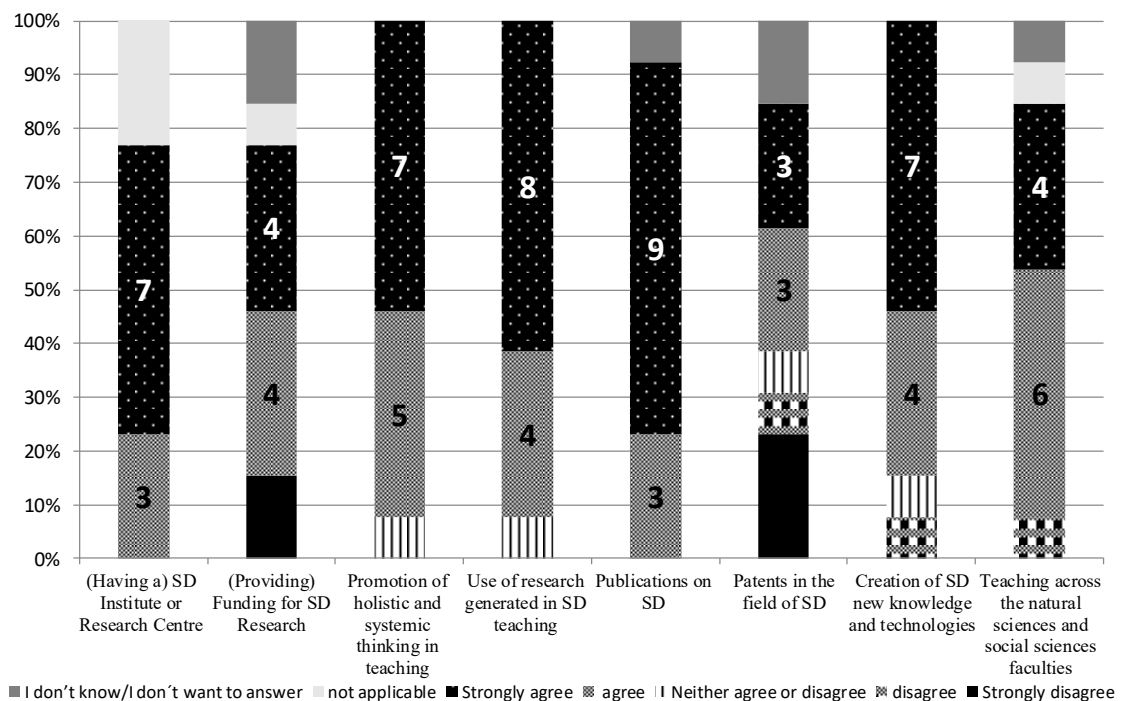
The SD implementation actions in research mentioned by the interviewees for DESD 2005-2014 included the promotion of holistic and systematic thinking in teaching, the application of findings generated in research in SD teaching, the increased number of publications on SD and the creation of SD institutes and research centers (Figure 21) focusing on the environment and sustainability in areas such as marine science for example.

Figure 21 Interviewees' opinions about the implementation of sustainable development in research during UN Decade 2005-2014



Implementation of these sustainability actions in research was reinforced in 2018 (Figure 22) with the creation of new knowledge and technology for SD and teaching across the natural sciences and social sciences faculties.

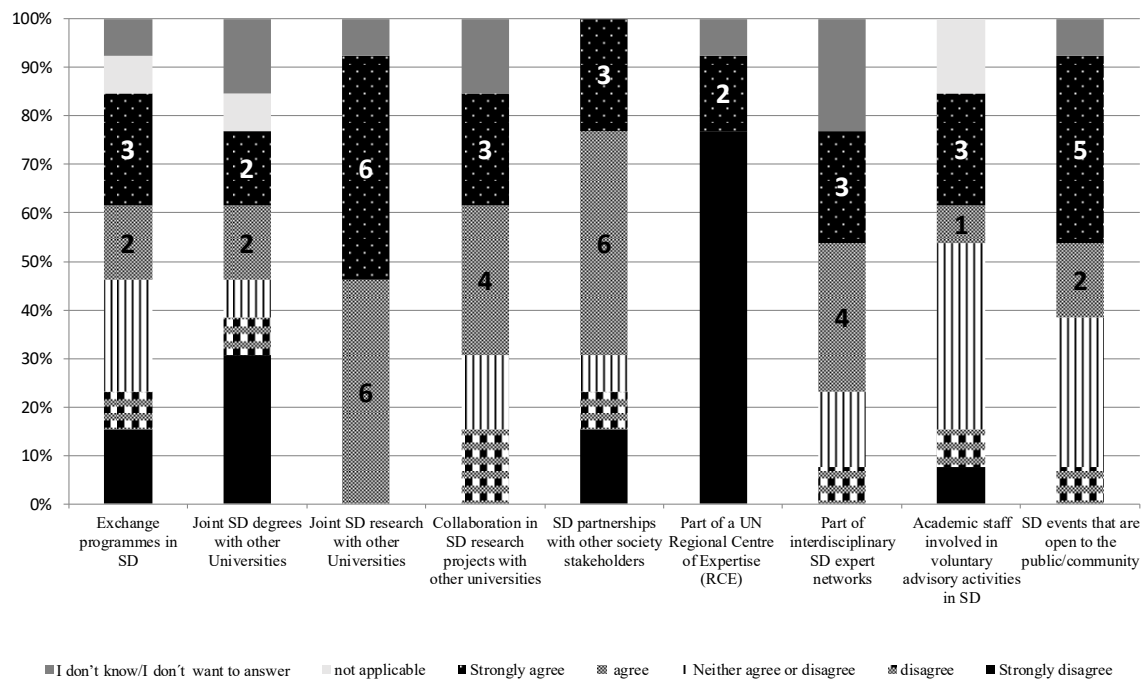
Figure 22 Interviewees' opinions about the implementation of sustainable development in research in 2018



The less frequent actions focused upon included providing funding for SD research and holding patents in the field of SD. Regarding the latter, only two interviewees mentioned concrete examples regarding patents in sustainability.

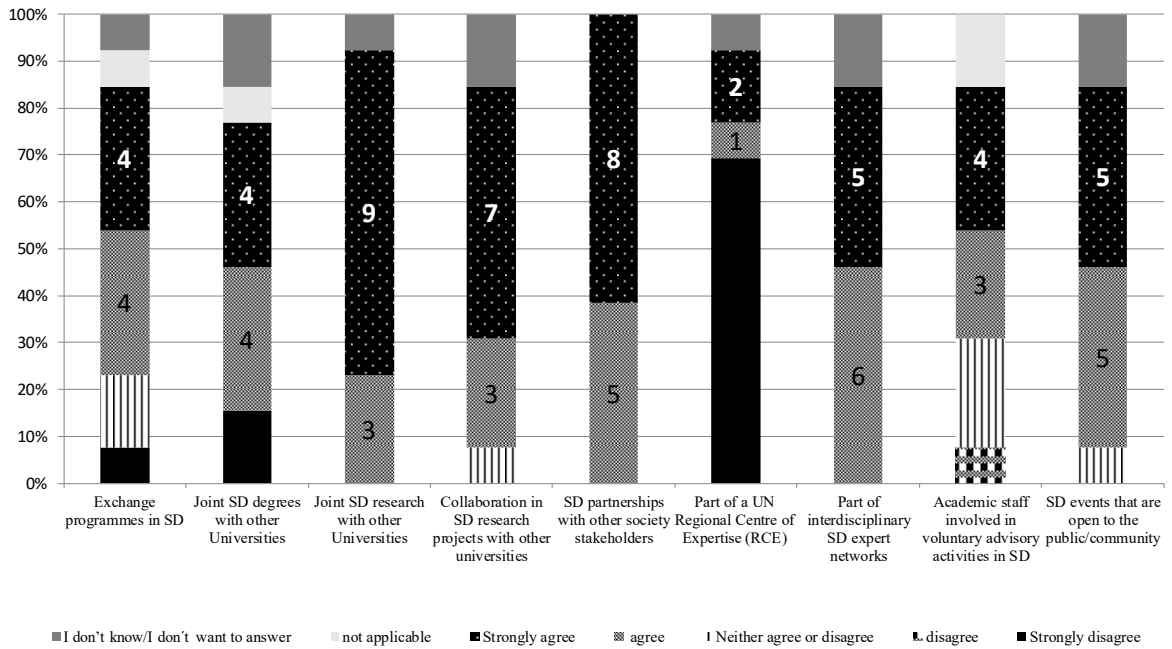
The respondents' answers to questions related to the implementation of SD in outreach and collaboration during the Decade 2005-2014 through several initiatives are shown in Figure 23.

Figure 23 Interviewees' opinions about the implementation of sustainable development in outreach and collaboration during UN Decade 2005-2014



The creation of joint SD degree programmes with other HEIs, which was not relevant in the period 2005-2014, became important for all universities according to the key actors' perspectives (Figure 24). Joint research collaborations and partnerships with other society stakeholders were seen as more pertinent in 2018 than in the DESD.

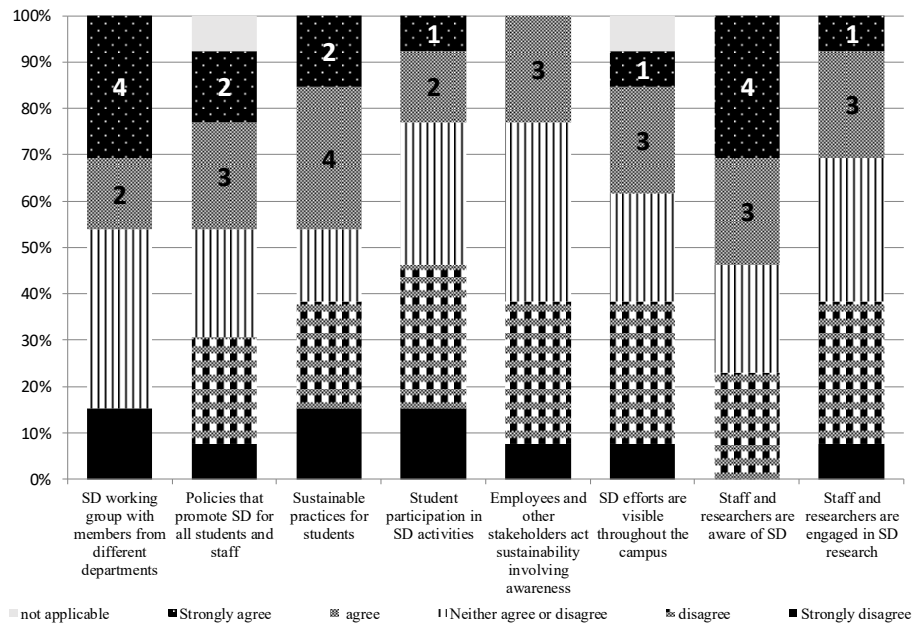
Figure 24 Interviewees' opinions about the implementation of sustainable development in outreach and collaboration in 2018



Being part of a UN regional center of expertise was the least frequently mentioned SD implementation action both in the DESD and in 2018. Only one HEI mentioned it.

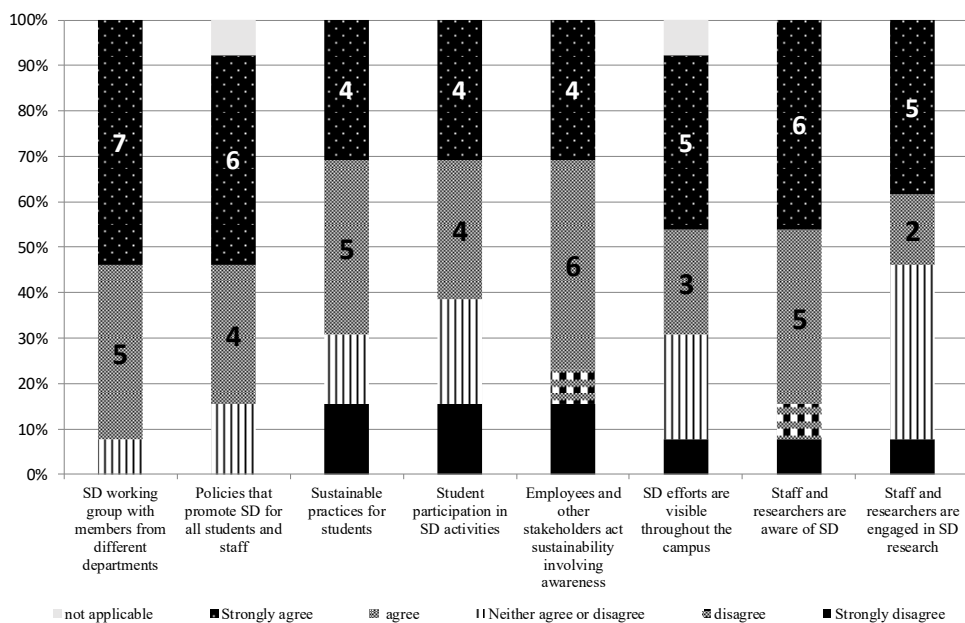
The three actions concerning implementation of SD through on-campus experiences during 2005-2014 most acknowledged by the interviewees were (a) SD awareness by staff and researchers, (b) sustainable practices for students, and (c) SD working groups with members from different departments (Figure 25).

Figure 25 Interviewees' opinions about the implementation of sustainable development through on-campus experiences during UN Decade 2005-2014



In 2018, the mentioned actions were reinforced according to the key actors and there were also other relevant foci in the implementation of SD in on-campus experiences, as shown in Figure 29.

Figure 26 Interviewees' opinions about the implementation of sustainable development through on-campus experiences in 2018



According to the interviewees, most of the actions concerning SD implementation in assessment and reporting in DESD 2005-2014 had low recognition (Figure 27). Nevertheless, in 2018 there were some considerable actions: (a) communication of SD activities, (b) international SD university rankings, (c) national SD university rankings, (d) national environmental university rankings and (e) assessment of SD (Figure 28).

Regarding SD implementation in assessment and reporting in 2005-2014 and in 2018 (Figure 27 and Figure 28) several interviews answered, “not applicable”, thus suggesting their previous and current lack of focus on reporting.

Figure 27 Interviewees’ opinions about the implementation of sustainable development in assessment and reporting during UN Decade 2005-2014

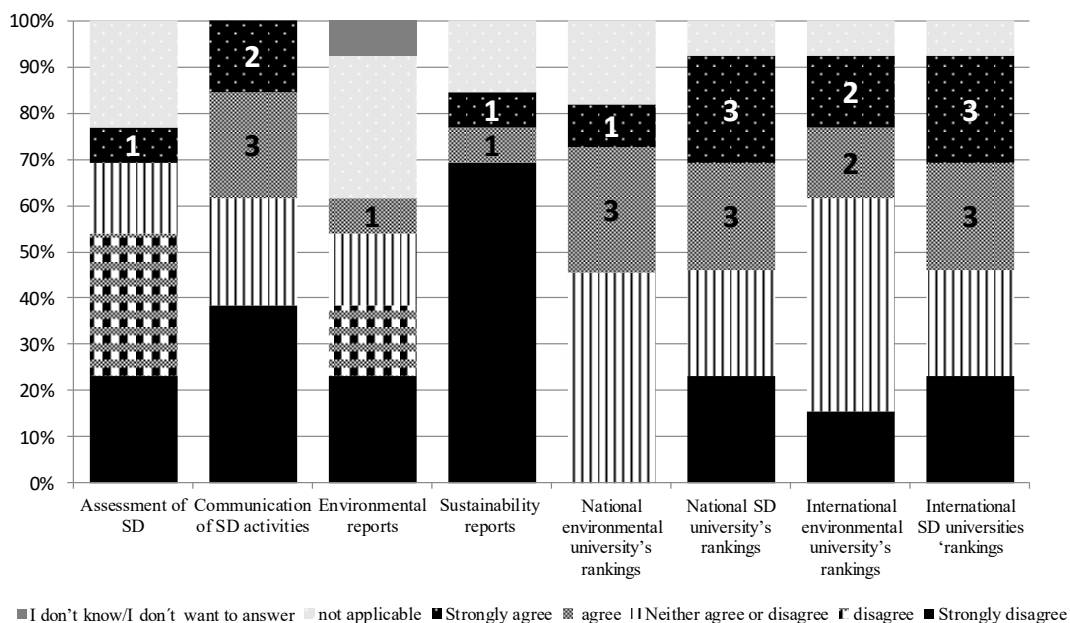
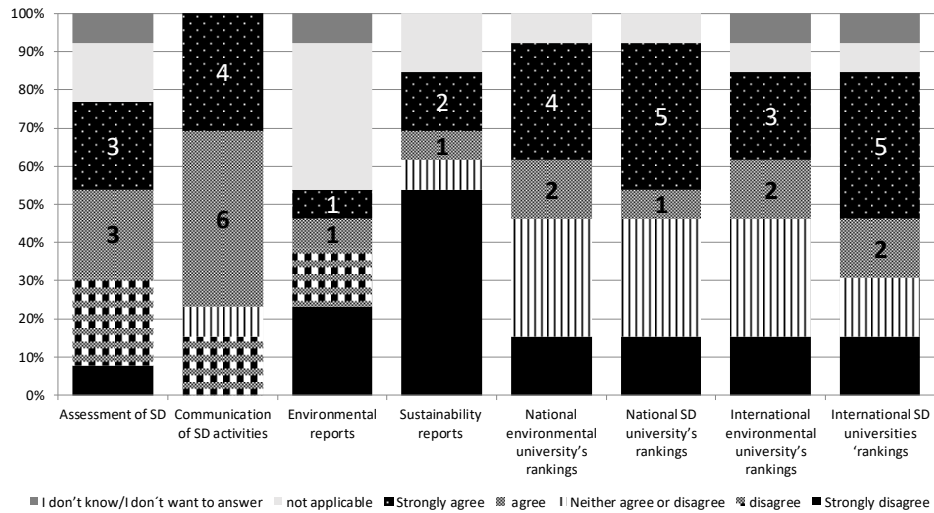


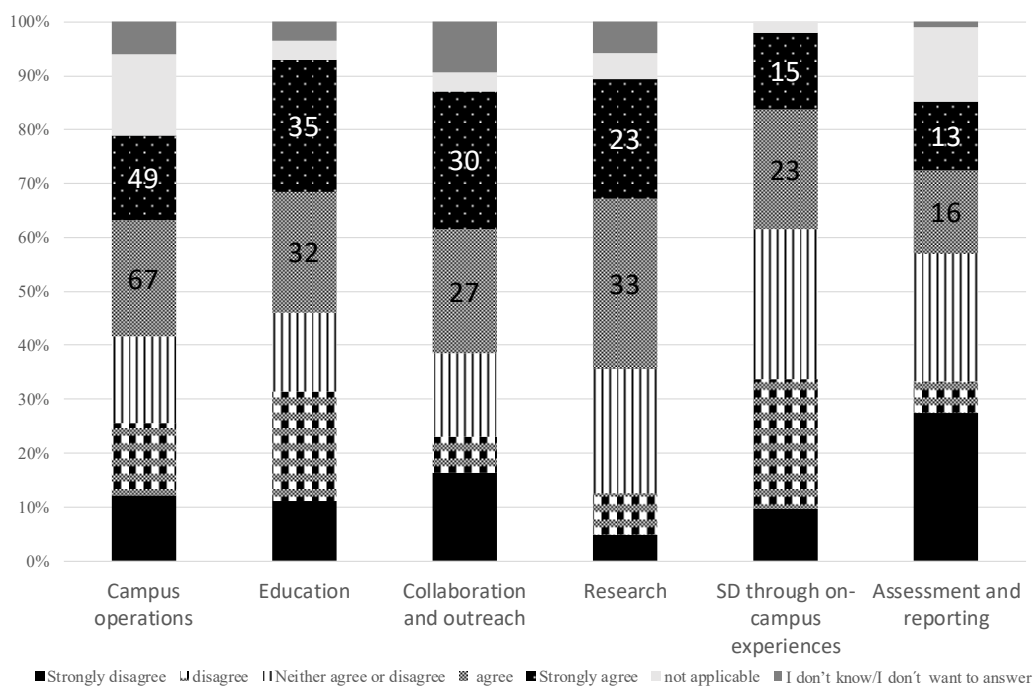
Figure 28 Interviewees' opinions about the implementation of sustainable development in assessment and reporting in 2018



3.1.2 Comparison of the different dimensions by descriptive analysis

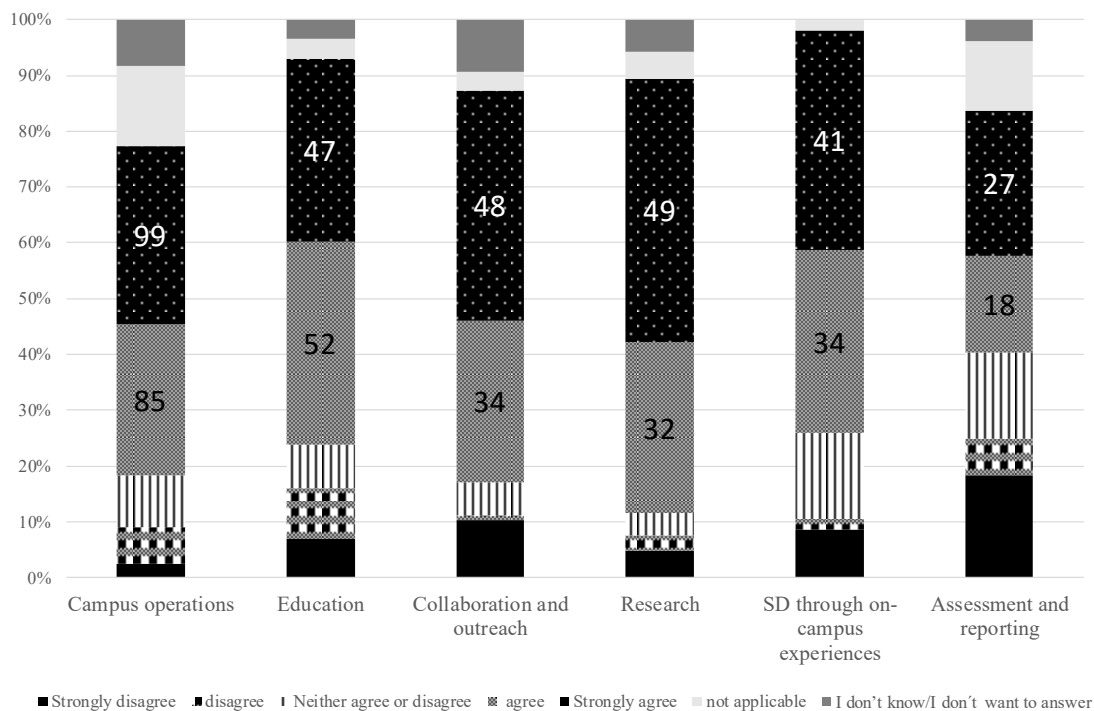
The answers from the seven dimensions that had close-ended questions (Appendix B.2) were aggregated to facilitate their comparison (Figure 29 and Figure 30).

Figure 29 Aggregated interviewees' answers for the campus operations, education, research, outreach, on-campus experiences, and assessment and reporting during UN DESD 2005-2014



The aggregation shows that the two dimensions of SD implementation with the highest recognition from the key actors in the DESD were campus operations and education. These were followed by collaboration and outreach, research and SD through on-campus experiences. These results indicate that there has been a relatively high level of SD implementation in most HEIs, except for assessment and reporting (Figure 29). In comparing 2005-2014 to 2018, with regard to the dimensions by which HEIs had implemented SD, there has been no change, but there has been a relevant increase in the number of actions (Figure 30).

Figure 30 Aggregated interviewees' answers for the campus operations, education, research, outreach, on-campus experiences, and assessment and reporting in 2018



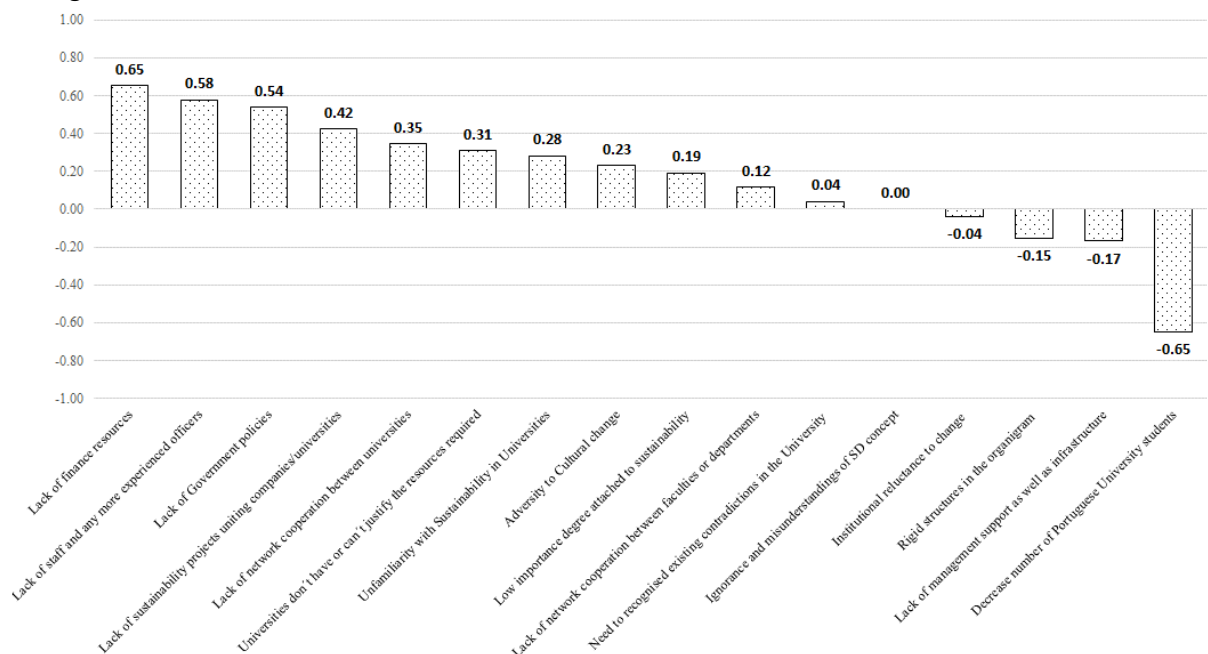
3.2 Barriers to implementing SD according to extreme balance answers

Using the EBA method allowed to identify the top three barriers to SD implementation that influenced strategies in Portuguese UHEIs during DESD 2005-2014 (Figure 31). In descending order (values are greater than 0 and closer to 1; a score of 1 corresponds to a 'totally agree' statement), the barriers were: (a) lack of financial resources, (b) lack of staff and experienced officers, and (c) lack of government policies.

The lack of financial resources (+0.65) was the obstacle perceived to hinder SD implementation the most in Portuguese universities.

The three barriers that mattered least in the eyes of the interviewees were: rigid structures in the organigram, lack of management support as well as infrastructure, and decrease in number of Portuguese university students. The declining number of students seems to have not been a barrier during 2005-2014, as its value is -0.65 (less than -0.5 and close to -1), which is nearly full disagreement to the question “was this a barrier?”.

Figure 31 Barriers to the SD implementation that influenced strategies in Portuguese public universities during UN DESD 2005-2014



One interviewee also mentioned “the lack of information systems for management decision-taking concerning setting priorities for sustainability programs”. Another respondent added the non-replacement of a professor’s staff, while the lack of awareness of top management regarding sustainability matters was also perceived to be a barrier.

In a range of specified choices (Appendix B.2, Question 3.1), in interviewees’ opinions, ignorance and misunderstandings of SD concepts, the need to recognize existing

contradictions in the university and institutional reluctance to change seemed to have had no impact on the integration of sustainability in Portuguese universities.

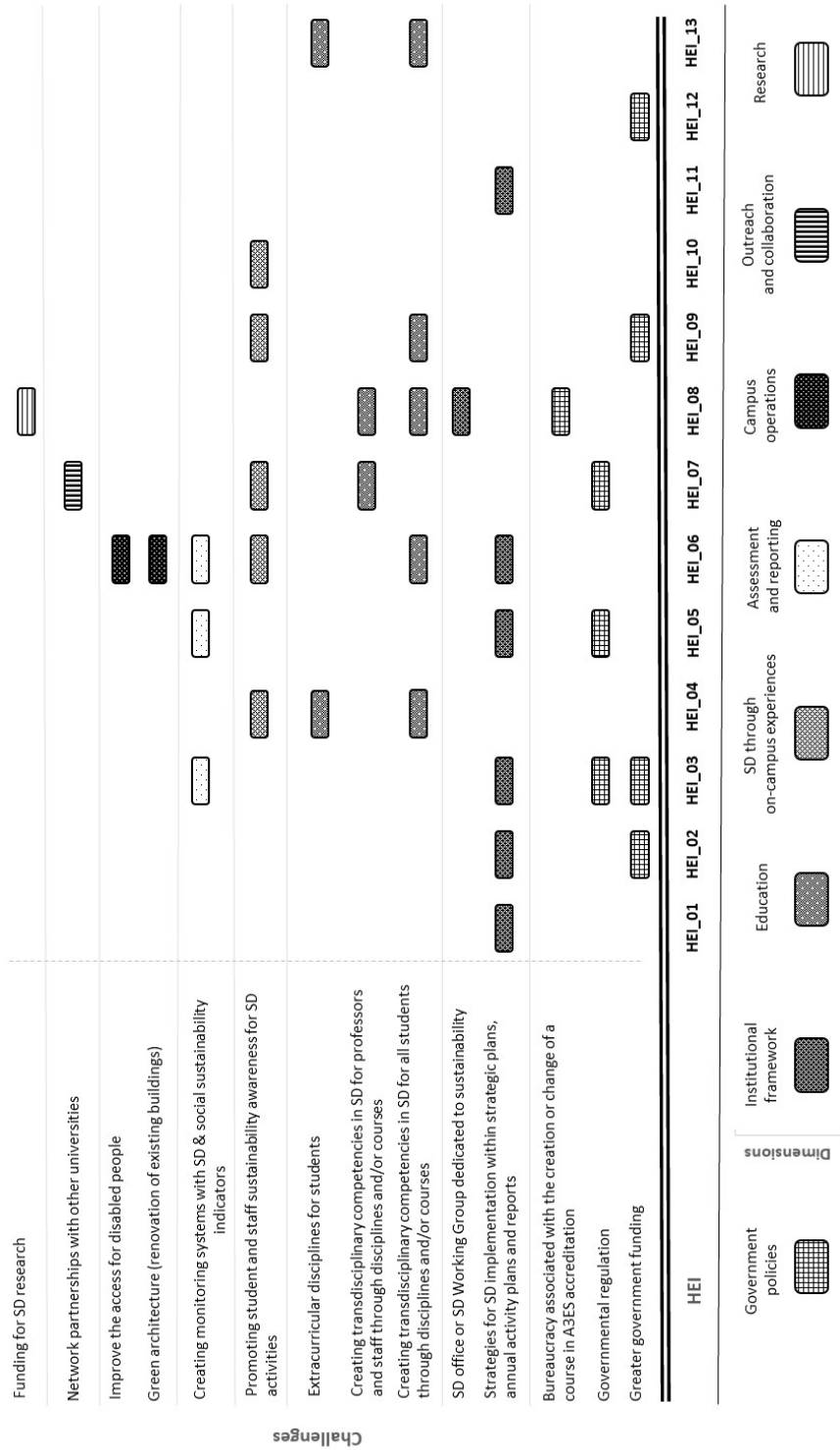
There were no answers concerning unwillingness to answer or lack of memory (“don’t know/don’t want to answer”) even though the question was about the 2005-2014 period.

3.3 Challenges for SD implementation that influence strategies in Portuguese universities

Universities have faced barriers to integrating SD for the past 15 years. Nevertheless, in considering the interviewees’ views, there were challenges to leveraging SD in both the short term and long run to make it an integral part of the university culture with synergistic effects within the institution and in society (Figure 32). Initiatives to enhance knowledge and sharing of good, integrated practices in Portuguese HEIs included:

- greater government funding;
- governmental regulation;
- strategies for SD implementation within strategic plans, annual activity plans and reports;
- creating transdisciplinary competencies in SD for all students through disciplines and/or courses;
- promoting student and staff sustainability awareness; and
- creating monitoring systems with SD and social sustainability indicators.

Figure 32 Challenges to the SD implementation in Portuguese public universities



Concerning challenges, the dimensions that are expected to have a greater impact on sustainability implementation at universities are: the institutional framework, education, SD through campus experiences and assessment and reporting. HEIs expect government to assist them in developing and deploying these curriculum changes and new programmes.

According to the survey analysis, the results obtained in Decade 2005-2014 and in 2018 are different (Figure 29 and Figure 30), which indicates that universities' challenges in implementing SD in the short term and the long run are mostly in other system dimensions that are probably not yet consolidated.

Interviewees suggested a number of strategies for SD implementation that could influence their own universities.

One interviewee from one of the HEIs suggested that the best way to address the proposed challenges would be to place the whole human resource community in charge of research to determine the SD implementation status and set priorities based on a cost/ benefit analysis. A workable plan for SD implementation would be defined and monitored through indicators. To promote what one of the universities so-called eco-sustainability, it was prepared an information packet with the purpose to "call people from 8 to 88 years old to see the campus with their own eyes".

New ideas for SD within strategic plans, activity plans and activity reports led to schemes by one HEI to implement SD through a rectoral mandate. This route has already been tested by another HEI for creating partnerships between foundations and community governments of Portuguese-speaking countries. Creating transdisciplinary competencies in SD for all students and promoting sustainability awareness of SD activities are the goals of one HEI, which will be put into practice through special training if government funding can be secured. It has been more than a decade since one other HEI has been involved in many sustainability projects, turning the bottom-up into a top-down strategy.

During the DESD 2005-2014 period, a lack of government policy was recognized by the interviewees as one of the most important barriers for integrating ESD in universities. This deficiency led to the advance of several timely actions and good practices that resulted

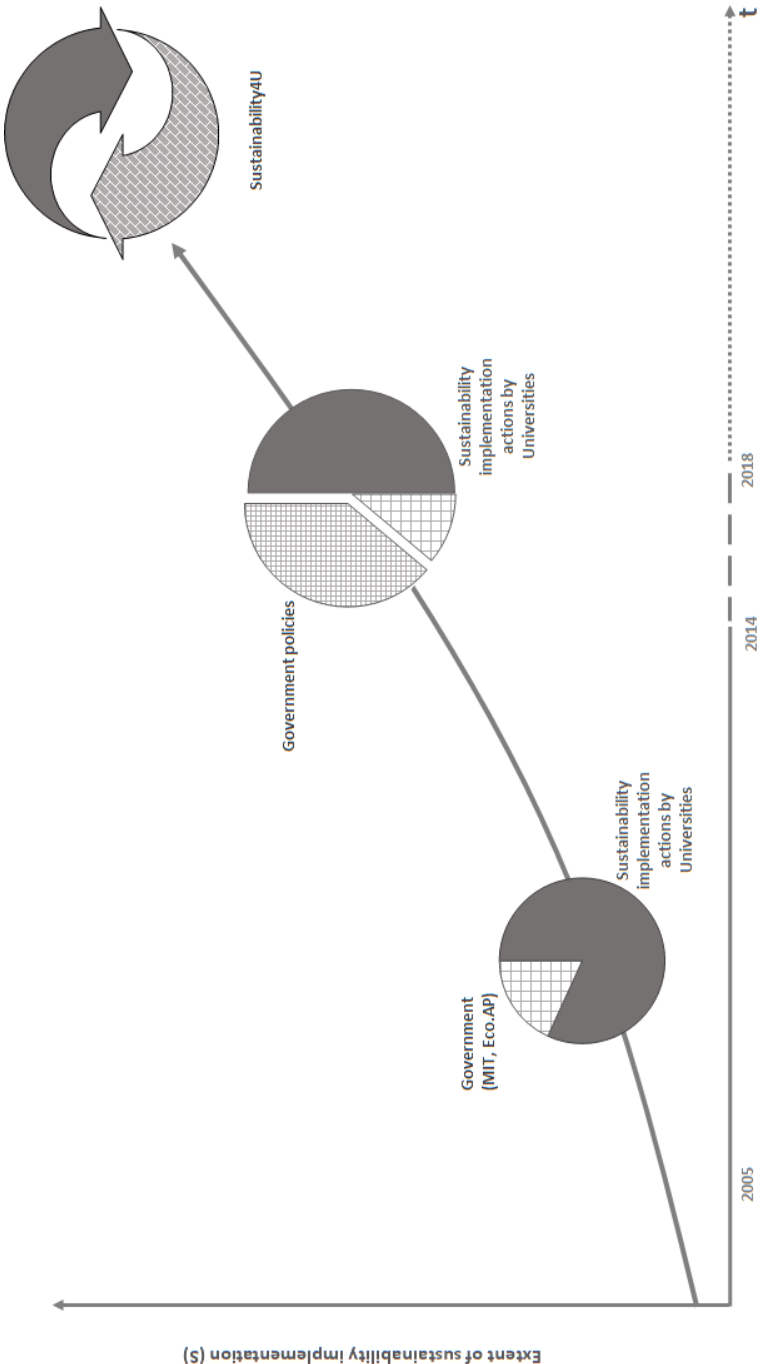
from their own initiative. The only exception was a programme of the Massachusetts Institute of Technology (MIT) Portugal and Eco.AP programmes, that came from the government's initiative. The MIT programme was launched in 2007 in partnership with the University of Texas at Austin, Carnegie Mellon University and the Fraunhofer-Gesellschaft. The Eco.AP program, whose main goal was to reduce energy consumptions in HEIs, was launched in 2011. Both programmes were systematized in campus operations and education, respectively.

From 2018 onward, the key actors in ESD at HEIs presented numerous plans, some of them requiring funding or regulation from the government.

From the key actors' perspectives, both the short- and long-term aims centered around ensuring that ESD became embedded in the curriculum and the university culture. These findings can be interpreted as addressing the challenges with multiple approaches can create a multiplier effect within the institution and the whole society (Figure 33).

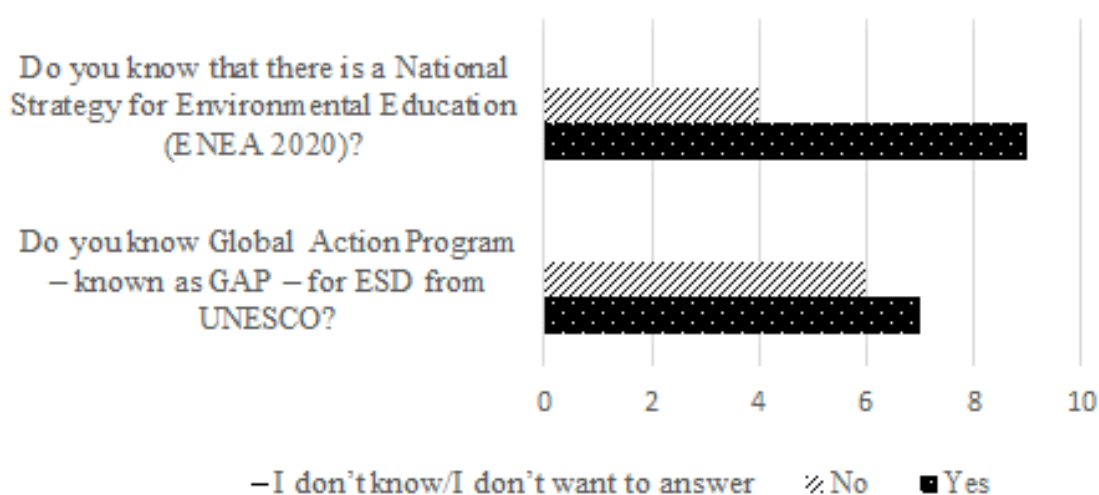
Portuguese universities are more aware of the National Strategy for Environmental Education (ENEA 2020) than of the program that succeeded DESD 2005-2014, which is known as Global Action Plan (GAP) (on education for sustainability), according to the interviewees. This shows that either GAP is not well advertised or the HEIs are not paying attention to these matters (Figure 34) because they are more focused on national actions.

Figure 33 Mapping challenges towards implementation sustainability in Portuguese universities in short and long run



The HEIs' alignment with ENEA involves more sustainable practices, such as reducing plastic consumption, carpooling, lowering energy consumption, eating healthier food, using smooth transport and providing good citizenship education. Nearly two-thirds of the universities have participated in conferences about sustainability in HE, which indicates their interest in this matter through partnerships, international networks or joint research projects.

Figure 34 Universities and Global and National Programmes



4. Discussion

4.1 - Discussion of findings

According to Lozano et al. (2015), signing declarations for ESD at the university level is an important driver for SD implementation, but does not determine it.

Few interviewees knew about the Copernicus Charter, a common international policy document, or that 2 out of 13 Portuguese universities had signed it. Moreover, Jorge et al. (2015) asserted that HEI leaders should show their commitment to sustainability by signing HEI declarations.

According to the interviews, universities implemented SD in institutional terms through their mission, vision and values as well as through their strategic plans and policies, which is in line with earlier findings (Aleixo et al., 2017).

Creating a SD working group or staff member dedicated to SD was found to be an important factor, but Lozano et al. (2015) warned that these factors may not be sufficient for promoting real changes in SD among HEIs.

Our descriptive statistical analysis showed that, in general, there has been considerable SD implementation throughout the university system in Portugal, namely, by actions in multiple dimensions such as campus operations, education, collaboration and outreach, research and SD through on-campus experiences. This is supported by findings from the literature review relating to other countries (Lozano et al., 2015), with the exception of SD action “providing SD research funding” (within the research dimension). This can be related to the economic constraints of the initial years of the decade, according to Heitor & Horta (2016).

The findings of this study suggest that some universities have introduced good policies not only for ESD planning but also regarding beneficial “green” practices such as waste separation, waste recycling and water management after the UN Decade 2005-2014.

This is in not in line with Aleixo et al. (2018) who showed that most institutions had only just begun planning for integrating SD practices. Our study is more up to date as the interviewees were asked to answer questions for the timeframes of the UN DESD and of 2018 onwards. It also comprised a direct invitation method used in the interview surveys (see Section 2.2.c) combined with data analysis applied to the target group. As an example of sustainability applied to campus operations, our findings highlighted efforts to promote sustainable food as well as healthy diets through university meal plans that offered vegetarian dishes, salads and fruits [(Direção Geral da Saúde and Institute for Health Metrics and Evaluation (2018))].

The results also revealed that each university has discovered its own path for defining and applying the concepts of sustainability (Clugston & Calder, 1999). This agrees with Lozano et al. (2015), except for SD implementation on the assessment and reporting dimension (the dimension with the least recognition according to the study’s results). With the exception of “assessing SD issues” and “communicating SD activities”, most of the actions had low recognition. Aleixo et al. (2018) stated that many institutions had already started

to include SD in communications. This finding is aligned with our 2018 results, as “communication of SD activities” was the most recognized topic concerning “assessment and reporting” dimension with a great increase compared to 2005-2014. From the interviewees’ answers, this is far more important than any ranking, national or international, related to sustainability or environmental preservation. Shi & Lai (2013), Cebrián et al. (2015) and Lauder et al. (2015) agreed that sustainability rankings contributed to HEI managers’ adoption of SD, because they attracted the attention of university administrators. However, Disterheft et al. (2016) felt that SD communication should reflect an actual change in thinking and not be solely a function of an arbitrary ranking.

Our EBA findings suggested that one problem HEIs faced during DESD was that funding for SD was not forthcoming because of the Portuguese economic crisis of the early 2010s. This hypothesis was substantiated by reports from Shriberg & Harris (2012), Waas (2012) and Figueiredo & Tsarenko (2013). According to Aleixo et al. (2018), universities attempted to overcome their financial difficulties by enforcing cost-reduction policies. They also incremented and diversified their alternatives to assure economic sustainability, notably by seeking private financing at the national and international levels and competing for research funding. This fact can explain the improvements in diversity and number of actions when comparing the DESD decade with situation in 2018.

Worldwide, the human factor is one of the most challenging obstacles that can stop or slow down change at universities (Blanco-Portela et al., 2017). The role of the individual as an agent of change and the human dimension in general are increasingly acknowledged as critical elements in integrating sustainability at HEIs (Kapitulčinová et al., 2018). The “lack of staff and more experienced officers” as well as “the lack of government policies” were rated as “the most important” barriers for implementing SD during DESD 2005-2014 in universities. The absence of government guidelines for sustainability development meant that universities had more freedom to create a customized approach, which was aligned with the research team’s earlier work (Farinha et al., 2018). The universities’ sustainability integration did not come from a superior entity’s recommendation but from a “bottom-up” approach, in which each institution followed its own strategy.

According to the interviewees, one of the barriers that seems to have had only a slight influence on sustainability implementation in Portuguese universities during 2005-2014 was the rigid, antiquated organizational structure. This is not in line with Aleixo et al. (2018) who claimed that an organization's function was hampered by multiple hierarchical levels and long distances between buildings within the same university. Moreover, ignorance and misunderstanding of the SD concepts, the need to recognize existing contradictions in the university and institutional reluctance to change were not perceived as being impact factors, contrary to the results of many authors (Leal Filho, 2000; Shriberg & Harris, 2012; Waas, 2012; Adams, 2013) who mention change as being difficult to implement in universities.

Despite a lack of financial resources and human capital, and having to work with burdensome government policies, Portuguese universities undertook many sustainability actions, even though some of them seemed to have been decided in isolation from each other and were not holistically integrated. Partnerships with other stakeholders and cooperation with other universities for joint research as well as joint degrees have recently become more relevant. This is in line with Vargas et al. (2019), who defended the opinion that implementation of SD in universities can occur by increasing network density and shared governance.

HEIs may address the challenges of the twenty-first century by integrating sustainability in their own activity process where good practices and projects can take place. Blanco-Portela et al. (2017) showed that while universities have made some progress towards the integration of sustainability, they have yet to fully achieve the internalization of sustainable practices. Universities still need to modify and update the operating dynamics that have been in place historically, although Lozano et al. (2015) concluded that the drivers for change in SD were already activated and that the institutions were well on their way towards sustainability.

Adams et al. (2018) proposed a conceptual framework for designing workable sustainability programmes that actively monitored progress considering the universities' commitment with ESD. In their opinion, in building a long-lasting sustainability culture by using a more

intuitive framework will help to move the university beyond its current technically oriented, piecemeal approach to meet the challenge of full integration.

Public universities in Portugal still face roadblocks in developing effective ESD programmes because of government inaction or from their own ineptitude. The unchanged aim is still to ensure that SD becomes an integral part of the university culture, to create a multiplier effect within the institution and the whole society. Universities can foster SD by setting good examples, incorporating on-campus experiences and educating current and future generations to think in terms of sustainability. Teaching needs to embrace the cross-fertilization between the natural sciences and the social sciences, the transition to holistic and systematic ways of thinking and the practical application of new research findings. This multidisciplinary approach seems to be the path of the future.

Caetano and Felgueiras (2018) demonstrated that SD was best taught through a multidisciplinary, interdisciplinary approach. Therefore, it is becoming increasingly imperative that universities take a more holistic view of their system elements and impacts to strengthen their contribution to SD (Findler et al., 2019) and align them within the university sustainability culture (Adams et al., 2018).

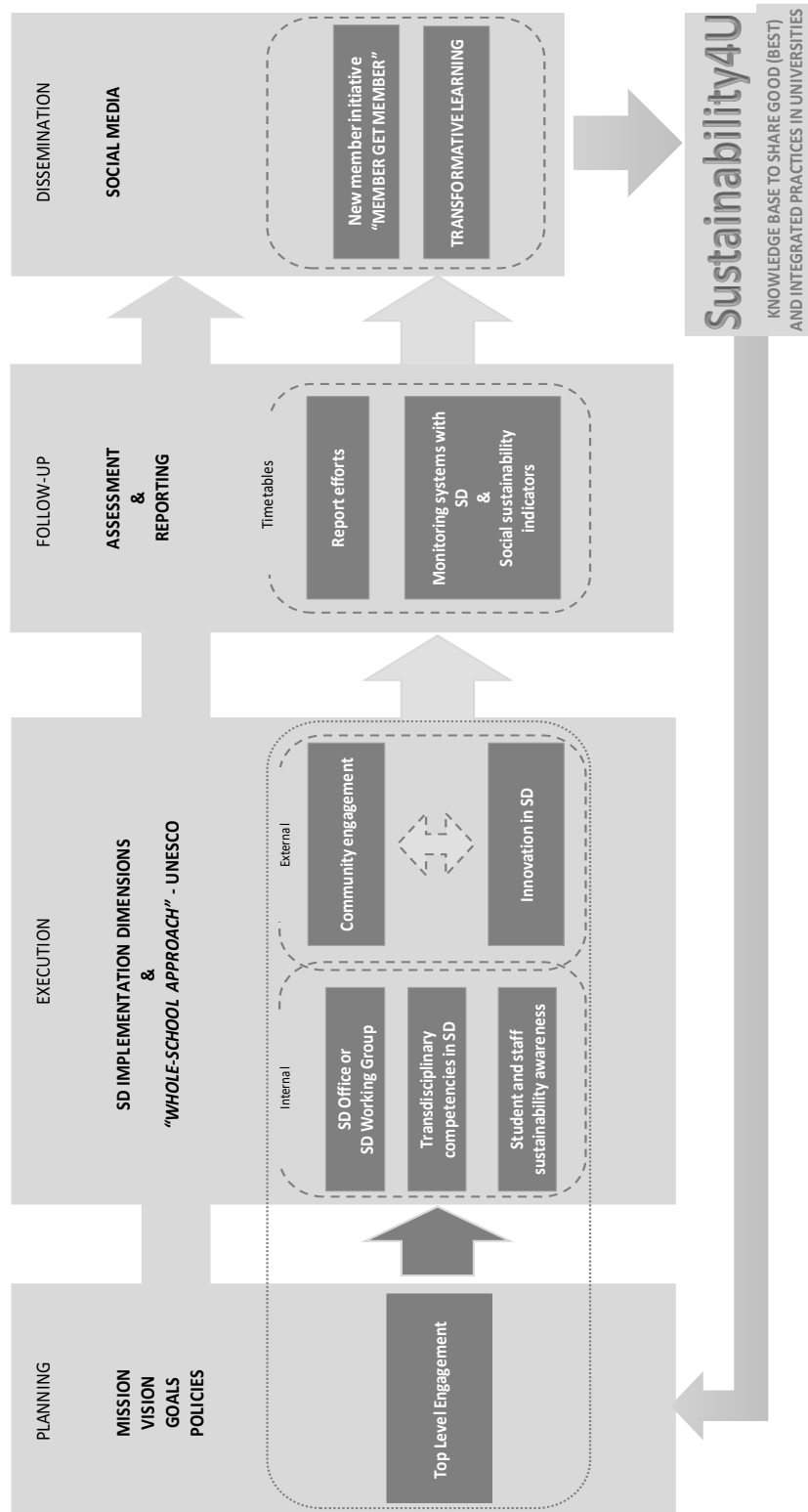
4.2 - Sustainability4U platform

One outcome of interviewing sustainability HEIs' key actors was to acknowledge what had been accomplished in adopting ESD throughout the decade and in more recent years despite the barriers faced by HEIs. In addition, discussed the problems that institutions had to overcome over the years and the solutions they found to ensure sustainability implementation in the short and long terms. This information will allow others to propose strategies and policies for sustainability improvements and share them among all universities. Accordingly, it is feasible to complete the country profile for ESD implementation in Portugal. As there is still an opportunity for the community to learn from the process of trying to embed sustainability in the Portuguese university community, the establishment of a platform called Sustainability4U (Figure 35) was proposed based on initiatives whose purpose is to enlarge and allow knowledge transfer, as well as to share good practices among all Portuguese universities. The platform, which focuses on the

challenges and the ways to address them as expressed in the interviews, will be available for use by any university that wishes to join the programme.

The SD initiatives identified by the interviewees included increased government funding, appropriate governmental regulations, strategies for SD implementation within strategic plans, annual activity plans and reports and the creation of transdisciplinary competencies in SD for all students. Considering the interviewees' opinions concerning difficulties in developing integrated SD programs and ways to address them, a greater focus should be placed on communications and the monitoring of progress through specific indicators. In light of what was accomplished in Latin America, where 65 universities in Argentina, Brazil, Colombia, Costa Rica, Chile, Guatemala, Mexico, Peru, Dominican Republic and Venezuela participated in RISU – a project to define indicators for the evaluation of sustainability policies at HEIs (Benayas, 2014) – a similar approach needs to be adopted in Portugal (Farinha et al., 2019).

Figure 35 Sustainability4U platform



Concerning factors that affected the incorporation of SD into curricula in European HEIs, Lozano & Barreiro-Gen (2019) found variations according to gender, education level and country. Leal Filho et al. (2019) considered lack of incentives and lack of coordination as the most important reasons behind a lack of local cooperation and support in running sustainability-related events at the university and supporting joint sustainability projects.

The study findings suggested cooperation as an asset mentioned by many of the key actors during the interviews.

The Sustainability4U platform was planned as a result of this study to be an integrated system, where members could come together to discuss issues of mutual interest. It will be organized and linked to the Portuguese Sustainable Campus Network, as Portugal is a small country and it is easy to establish communications among universities, thus allowing member universities to benefit from each other's experiences. This is corroborated by Lozano et al. (2019) who showed that educators from different countries sharing experiences with SD courses at various educational levels provided students with better SD skills and insights.

The Portuguese Sustainable Campus Network was created in 2018 among community members from Portuguese HEIs aiming to share knowledge and experiences with the academic community, but also to encourage top managers to sign a commitment letter based on the Copernicus Charter and the National Strategy of Environmental Education. This initiative showed a welcome engagement of the Portuguese academic community and serves as a good example of a bottom-up approach. Portuguese universities have already built a "cooperative network of human capital" allowing the communication among HEIs through the Sustainable Campus Network.

Taking the objectives of an integrated approach at the national level to the DESD (UNESCO, 2005), Portuguese HEIs have been taking a bottom-up strategy, which is not in line with the top-down approach from UNESCO (2005a), i.e. from governmental ministries.

4.3 – Limitations of the present study

In 2018, there were fewer answers indicating indecision (“neither agree nor disagree”), unwillingness to answer or lack of memory (“don’t know/don’t want to answer) compared to the results in the UN Decade 2005-2014 period. This might indicate that interviewees had a greater knowledge of the subject or that it was an expectable effect of memorization.

The methods used had some limitations. Because this research was national in scope, the findings should only be interpreted in a Portuguese context. Despite the high rate of success considering the target group (13 key actors were interviewed out of 14) and requests for interviews, the numbers did not necessarily mean that the authors considered to have obtained more reliable data. The direct invitation method used in the interview survey provided good answers but might (in a few cases) not have been targeted to the person with the most complete knowledge of sustainability implementation efforts and activities at their institution.

The interview was developed to be comprehensive and to cover a large number of issues, but interviewees will not have complete knowledge of all topics and issues addressed. The data that were analyzed by EBAs resulted in “undecided” answers that had no weight as these calculations did not include neutral responses such as “neither agree nor disagree”. This approach gives less importance to answers at the medium level (#3) and more importance to the extremes (INE, 2019).

5. Conclusions

This study was carried out to contribute information that had been lacking about how sustainability had been integrated into the policies and strategies of Portuguese public universities. The study was based on a literature review, earlier detailed data treatment and interviews with key personnel at the universities with experience in sustainability decision-making. The study period encompassed the past 15 years, within the framework of the UN DESD 2005-2014 and until 2018. Moreover, the focus was likewise on interviewees' insights for the future.

Since the DESD, there has been improvement in incorporating sustainability in Portuguese universities. It seems that each university that has integrated sustainability had its own strategy and implemented it at its own pace and rhythm, both throughout the decade and in recent years.

Some HEIs chose only one path and others more than one. Campus operations, education, collaboration and outreach were the dimensions with the highest recognition for SD implementation. This is seemingly in line with the lack of integrated strategies and policies related to ESD at the national level. In addition, in each university, the different actions seem to have been taken in isolation from each other and not holistically integrated, with the exception of SD partnerships, research projects, publications, collaboration in SD projects and funding for research. Teachers and researchers in Portuguese Universities work together on articles, papers and book chapters.

The study also highlighted the key areas where HEIs could address barriers to sustainability and come up with solution to the problems. Despite continuing difficulties such as lack of funding, not properly trained people and unfavorable government policies, the universities moved forward to confront the remaining obstacles. From the empirical findings, the main challenges in SD implementation involved initiatives from the governmental level. This is the case for funding, regulation or the existence of an office dedicated to ESD.

The transfer of knowledge and sharing of best practices among Portuguese public universities is recommended to ensure that SD may become an integral part of the

organizational culture of Portuguese universities. Thus, creating a long-lasting cascade effect both within the institution and in the society.

A range of possible initiatives was put forward to enlarge the knowledge and sharing of good, integrated practices in Portuguese HEIs, with the goal of contributing to a new definition of a country profile regarding sustainability in the HE sector. Future investigations will be undertaken through the proposed Sustainability4U platform that should target not only public universities but all the HEIs in Portugal.

The example of Portugal might then be used as a case study, to draw from which similar regions can learn from these experiences, avoid the same mistakes and surmount the barriers.

FINAL REFLECTIONS AND CONCLUSIONS

Conclusions

Based on the similar trend published documentation, it is likely that the HESD knowledge base will more than double in size by 2025 comparing to present time (Hallinger & Chatpinyakoo, 2019).

In order to answer the research questions outlined at the beginning of this thesis (“how the sustainability was integrated in public Portuguese universities, within the aims of DESD 2005-2014?”), this section is divided into four subsections, using one separate section for each specific objective.

- (i) Assess the extent (if and how) to which the Portuguese Government and the Ministry of Science, Technology and Higher Education (MCTES) integrated sustainability in their plans, programmes and policies

This objective may be achieved through the answer “it seemed there has been a lack of commitment from governmental institutions to implement ESD at the university level”. This results from the documentary analysis between the Great Planning Options (GPO) (2005-2009, 2007, 2008, 2009, 2010-2013, 2012-2015, 2013, 2014 and 2015) and the three Constitutional Governmental Programmes (CGP) XVII (2005 to 2009), XVIII (2009 to 2011), XIX (2011 to 2015)) content analysis for 2005-2014 period as well as Ministerial documents. Nevertheless, the findings suggest that “sustainability” or “sustainable”, although more recent, is a far more adopted and accepted concept than before, even with other meanings.

- (ii) *Assess how public Portuguese universities implemented sustainability in their plans, programmes and policies according to some key actors’ perspectives with decision making impact***

After analyzing the official documentary sources and interviewing the key actors, who referred other previously uncovered published information and regulations, only a few of them considered that the political and strategic government documents are partly linked to ESD implementation at public universities.

From these analyses there are some final remarks about ESD implementation at public universities:

- After reviewing the official documentary sources and interviewing the key actors it seems that there was a clear insufficient incorporation of ESD through governmental or Ministerial policy and strategical level in the public universities, and that the Government's only major engagement was the Massachusetts Institute of Technology Portugal Program (creating the PhD (Doctor of Philosophy) in energy sustainability program at University of Coimbra);
- The universities did not demonstrate adequate top-down policy or strategy in terms of SD. The Government, Ministry and CRUP did not have an active role and did not produce any integrated document in the sustainability implementation into policies and strategies of universities. Also, UN DESD 2005 - 2014 was not found to be a common motivation for implementing university sustainability;
- The impact of the UN DESD 2005-2014 in Portuguese society was mainly through the dissemination of problems and solutions of "lifelong learning", mostly at primary and secondary schools;
- The economic crises that the country suffered over the past decade and political instability could explain this lack of commitment. Nevertheless, Portuguese universities' autonomy and social responsibility led them to develop several timely initiatives and policies towards ESD.

(iii) Analyze the extent to which ESD has been integrated in universities through their strategic plans, sustainability reports and activity plans and reports

Portuguese public universities integrated sustainability into university policies and strategies mainly through "campus operations," "outreach and collaboration," and "SD through on-campus experiences" during the United Nations DESD 2005–2014.

The step-by-step treatment and systematic analysis of more than one hundred documents helped to understand and value the possible sustainability implementation actions and results on the strategies and policies of the public universities.

Notwithstanding the insufficiency of national combined strategies or policies related to ESD, the outcomes show that individual movement has made progress at each university level, with good examples and initiatives in several Portuguese universities. It seemed that universities' actions related to ESD have been taken in "isolation" and were not integrated according to a whole-institution approach.

Nevertheless, the results show that Portuguese public universities implemented sustainability through different and multiple actions whether or not under any DCI – Declarations, Charters and Initiatives.

The implementation of ESD at public universities provides insights about (best) practices regarding green campus procedures, which were found in many of the studied universities.

Lastly, it was possible to pre-define the country profile as well as a proposal of a think tank of initiatives for the implementation of sustainability in the HE sector, highlighting the importance of analyzing the content of strategic and activity plans as well as strategic and activity reports of HEIs.

(iv) Analyze the different self-reported ESD practices of the last 15 years and propose a think tank of initiatives to be applied by Portuguese HEIs.

This study was carried out to bridge the lack of information on the extent to which sustainability has been integrated into the policies and strategies of Portuguese public universities, during the last 15 years, within the framework of the United Nations Decade of Education for Sustainable Development DESD 2005-2014 and after until 2018, and their insights for the future.

The contribution of university's sustainability self-assessment and previous literature review, and subsequent detailed data treatment was essential for some the findings.

Since the DESD 2005-2014 until 2018, there has been an improvement in incorporating sustainability in universities.

Each university that has integrated sustainability had its own strategy, implemented it at its own pace and rhythm, and through what it deemed the most suitable action at the time. Some universities chose only one path and others more than one. Campus operations, education, and collaboration and outreach are the dimensions self-reported with the highest recognition of SD implementation. There are good practices in almost all universities, and some have more than one. However, concerning SD implementation there seems to be no integrated approach in public universities.

Despite the recognized barriers during the DESD, such as lack of financial resources, human resources, and government policies, universities moved forward. Despite some of the initiatives seem to have been taken in isolation from each other and not holistically integrated, some exceptions are shown as SD partnerships, SD research projects, publications, collaboration in SD projects and funding for research.

Findings suggest that the higher number of challenges to the SD implementation is related to actions carried out at the governmental and institutional level (e.g. funding, regulation, strategic and activity plans and activity plans and reports, creating transversal competencies on SD for all students through disciplines and/or courses, promoting transdisciplinary, and an office dedicated to ESD at the universities that lack one). Regarding the Sustainability Office, Ramísio et al. (2019) refer that it should exist, as a cross-sectional support to all mission areas, allowing a very strong, relevant and strategic link to the investment plan, which consolidates and reinforces the institution path in the area of sustainability.

The challenge is to ensure that SD becomes an integral part of the university culture and thus create a multiplier effect within the institution and in society, both in the short and long term. This represents an irrefutable challenge to all Portuguese HEIs in order to induce the needed transformation, from the local to the global level (Ramísio et al., 2019).

In 2018, the Portuguese Sustainable Campus network was created among the community members from Portuguese HEIs (universities and polytechnics) not only to share knowledge and experiences, but also to convince HEIs' top managers to sign a commitment a letter based on the Copernicus Charter and the National Strategy of Environmental Education.

The commitment for the implementation of public policies in the universities is critical for the effectiveness of the process concerning ESD and there is an ultimate need for the change of the paradigm, making the aforementioned network a good example of a "bottom up" movement.

A good initiative (of many of the think tank of initiatives) is the well-integrated system "members get together" that can be organized and linked, as Portugal is a small country and it is easy to establish communication among HEIs. One HEI can share best practices with one another (member), in a network.

The platform Sustainable4U is the proposed way to conceive the think tank, share and transfer knowledge and (good) best practices among universities.

Considering new trends in society, ambitious students choose international topics, transdisciplinary thinking and digital environments, but are eager to meet bright career and EDS will definitely prepare them for the future to come "in order to meet the needs of the present, without compromising the ability of future generations to meet their own needs."

Limitations of the study

The common criticism on qualitative research methods - e.g. on being too subjective, difficult to replicate and to generalize (Bryman, 2012) is acknowledged beforehand by a study of this nature.

To each part of our study, we point out the limitations in this section, using one separate section for each question.

Despite the efforts (Chapter 1), we were able to gather a relatively small number and quality of documentary sources regarding Governmental and Ministerial documents which is a limitation. Adding this we consider these sources as a sample and so they cannot be regarded as representative, but this can show the lack of commitment from the governmental institutions towards ESD.

Nevertheless, one cannot refer assuredly about the representativity of the sample, despite our best efforts, and even though many documents haven't been collected, they could possibly exist, and not be available and/or accessible to the researchers.

Regarding the key actors' perspective towards ESD implementation (Chapter 2), it would have been very interesting to have the opinions of the Minister of Science, Technology and Higher Education as the Secretaries of State. For its relevance, it would also have enriched the study to have interviewed at least one more chairperson of the CRUP (namely, the leader from 2010 and 2014), but that was not possible despite our efforts.

The convenient sample does not allow the results to be generalized to the Portuguese higher education system. Not only had the number of interviewees (seven out of fifteen) limited the study, but also due to the nature of the respondents (from the Government, Academia and civil society).

Nonetheless, the aim of the interviews with the key actors was to confirm earlier official documentation analysis, and each interview was very complete, allowing approaching data saturation (Saunders et al., 2009), that means, additional data collected would provide little, information.

For the relevant period (2005–2014), most universities published all the documentation necessary for treatment and analysis (Chapter 3), yet in relation to some universities it would have been important to have access to further and a larger number of published or available documents. For that, the best efforts were done either through websites or direct contact with staff and documentation centers.

The direct invitation method of the interview survey provided good answers (Chapter 4), but (in a few cases) might not have targeted the person with the most complete knowledge of sustainability implementation efforts and/or activities at their institution.

The interview was developed to be comprehensive and to cover many issues. However, it may be difficult for an interviewee to have adequate knowledge of all topics and issues addressed.

Future research

Sustainability and HESD are two subjects that go along together but haven't been deeply studied in Portugal except for the last 5 years and as in the rest of the world (more likely in Europe) is likely to double within 7 years (base=2018). So, this study is on the research agenda.

The platform Sustainability4U may contribute to a new and continuous collaboration process between Portuguese universities but also at public polytechnics and at European and international levels based on a case study of a European Southern country as Portugal. For that it would be possible to enhance the collaboration namely through already existing European networks namely the GUNi – Global University Network for innovation that includes as members HEIs, research centers in HE, networks and other institutions related to higher education.

It will be also interesting to extend this study to the other HEIs in Portugal, public and private, using the same documentary analysis and interview script as used in universities. This will allow a complete HEI country profile.

Concerning the think tank of initiatives, and besides “member get member” the following practices could be developed in the different universities:

- Education: Create disciplines or courses jointly or not between HEIs to leverage transversal competencies on SD for all students promoting transdisciplinary (namely in the 1st year of the undergraduate programmes);
- Outreach and collaboration: involvement of Governmental entities, universities' rectors and other people relevant role actors for sustainability processes in HEI through the use of innovative participatory methods (following Disterhelft et al, 2016 proposal methods) in order to motivate, engage and enlarge the implementation of EDS in HEI);
- SD through on-campus experiences: Create and evaluate an idea contest, Sustainability4ALL, which consists in presenting an idea to its implementation in real life promoting students' and staff sustainability awareness;
- Assessment and reporting: Assessment of the universities sustainability performance using an already existing tool (like "Sustainability Tracking, Assessment & Rating System" (STARS) or "Graz Model for Integrative Development" (GMID)) or adapt one for Portugal, that could allow not only a competition process but an incentive for improvement and collaboration. "STARS" is a transparent, self-reporting framework for colleges and universities to measure their sustainability performance (STARS, 2019).

POSTFACE

This doctoral thesis challenged me on a personal but also on a professional level.

Being an engineering and having an MBA I was missing something.

The link between Environment (I am an Agronomics engineer by the way), Economics (the MBA, which is more linked to what I do in my professional living nowadays, “managing whatever matter it takes”: from health, tourism, transports, employment, higher education) and ...Social). Above all, Social makes the link and the reason by which we start talking about Sustainable Development.

Due to the Brundtland (Thanks!) report and the courage of publishing “Our (common) world” (1987), people started to talk and put on their agendas this topic. We are talking about “ensuring the needs of present and future generations”.

I arrived late. In 2012.

Nevertheless, I got to the topic and in a very passionate way.

- *What can I do to improve, to help? (I asked myself)*

First, I must research the topic and learn about it and so I did the PhD program in UAb.

If someone can do the difference is the sustainability leaders within the universities. They are the change drivers. They are the professionals who were well versed in SD that could effectively educate students of “all ages” and help make the transition to “sustainable societal patterns” (Lozano et al., 2015).

The approach to sustainable development in this study was decided: “if and how the sustainability was integrated in public Portuguese HEIs, through their institutional strategies, within the aims of DESD 2005-2014?” Was it a top down or a bottom up approach? And How can I give insights to improve this integration?

The methods were mixed. The use of semi structure interview is essential to get the information and make people comfortable to share and trust it with us. We use this method in 50% of the study.

Here I am in 2019, almost seven years after the starting point, with endless hours of discomfort but happy to arrive safe and sound and the belief to have created value added and bridges to knowledge.

...Narrow the gaps. Bridge the divides.

Rebuild trust by bringing people together around common goals.

Unity is our path. Our future depends on it.

António GUTERRES - Secretary-General of the United Nations (On New Year's Day 2018)

What do I expect from the future within a 3-5 years' time?

The SDG 2030 has been leverage all the Goals including those linked to Education (not only #4) and so inspired by Global Action Plan (GAP) (2015) I do believe that (i) the Sustainability4U platform can be put forward if not by the initiative "sustainable campus network", (ii) by other bottom up initiative, or by (iii) an initiative already engaged by governmental bodies, or even by the bottom-up approach connected with a top-down approach in a mixed implementation of ESD. All of these aims to ensure that SD becomes an integral part of the university culture and thus create a multiplier effect within the institution and in society, both in the short and long term.

I do believe that **sustainability for universities** may help to shape a roadmap to address sustainability implementation and sharing best practices. Nevertheless, the assessment is mandatory to build a world for future generations.

REFERENCES

- Adams, C. A. (2013). Sustainability reporting and performance management in universities: Challenges and benefits. *Sustainability Accounting, Management and Policy Journal*, 4(3), 384-392. <https://doi.org/10.1108/SAMPJ-12-2012-0044>
- ADENE - National Agency for Energy. (2017). Lisbon, Portugal. Retrieved April 30, 2017, from <http://www.adene.pt>
- Adomßent, M; Fischer, D.; Godemannb, J.; Herzig, C.; Otte, I.; Rieckmann, M.; Timma, J. (2014). Emerging areas in research on higher education for sustainable development - management education, sustainable consumption and perspectives from Central and Eastern Europe. *Journal of Cleaner Production*, 62, 1-7. <https://doi.org/10.1016/j.jclepro.2013.09.045>
- APA - Agência Portuguesa do Ambiente (2020). *Estratégia Nacional de Educação Ambiental*. Lisboa, Portugal. Retrieved June 30, 2017, from [ENEA/AF Relatorio ENEA2020.pdf](#)
- Alba, D.& Blanco, D. (2008). Indicators for Sustainability at Spanish Universities. Retrieved July 12, 2014, from [Indicators for Sustainability at Spanish Universities](#)
- Aleixo, A; Azeiteiro, U.M; Leal, S. (2017a). UN Decade of Education for Sustainable Development: Perceptions of Higher Education Institution's Stakeholders. In Leal Filho, W., Azeiteiro, U.M., Alves, F., & Molthan-Hill, P. (Eds.), "Handbook of theory and Practice of Sustainable Development in Higher Education", in the series "World Sustainability Series". Springer, Cham, 417-428. https://doi.org/10.1007/978-3-319-47877-7_28
- Aleixo, A. M.; Azeiteiro, U.; Leal, S. (2017). The implementation of sustainability practices in Portuguese higher education institutions. *International Journal of Higher Education*, 19 (1), 146-178. <https://doi.org/10.1108/IJSHE-02-2017-0016>

- Aleixo, A.M.; Azeiteiro, U.M.; Leal, S. (2016). Towards Sustainability through Higher Education: Sustainable Development Incorporation into Portuguese Higher Education Institutions. In Davim J.P. and Leal Filho, W. (Eds), "Challenges in Higher Education for Sustainability", in the series "Management and Industrial Engineering", Springer, Cham, 159-187.
- https://doi.org/10.1007/978-3-319-23705-3_7.
- Aleixo, A.M.; Leal, S.; Azeiteiro, U.M. (2018). Conceptualization of sustainable higher education institutions, roles, barriers, and challenges for sustainability: An exploratory study in Portugal. *Journal of Cleaner Production* (172), 1-10.
- <https://doi.org/10.1016/j.jclepro.2016.11.010>
- Alonso-Almeida, M., Marimon, F.; Casani, F.; Rodriguez-Pomeda, J. (2014). Diffusion of Sustainability reporting in universities: Current situation and future perspectives. *Journal of Cleaner Production* (106), 144-154.
- <https://doi.org/10.1016/j.jclepro.2014.02.008>
- Anand, C.; Bisailon, V.; Webster, A.; Amor, B. (2015). Integration of Sustainable Development in Higher Education e a regional initiative in Quebec (Canada). *Journal of Cleaner Production* (108), 916-923. <https://doi.org/10.1016/j.jclepro.2015.06.134>
- Annan-Diab, F. & Molinari, C. (2017). Interdisciplinarity: Practical approach to advancing education for sustainability and for the Sustainable Development Goals. *International Journal of Management Education* (15), 73-83.
- <https://doi.org/10.1016/j.ijme.2017.03.006>
- Arroyo, P. (2017). A new taxonomy for examining the multi-role of campus sustainability assessments in organizational change. *Journal of Cleaner Production* (140), 1763-1774. <https://doi.org/10.1016/j.jclepro.2015.08.100>
- Association of University Leaders for a Sustainable Future (AULSF) (1990). Talloires Declaration Signatories List. Retrieved September 3, 2017, from <http://ulsf.org>
- Bardin, L. (1977). Content analysis [Análise de conteúdo]; Edições 70: Lisbon, Portugal, 1977.

- Barth, M. & Rieckmann, M. (2013). Academic Staff Development as a Catalyst of Curriculum Change Towards Education for Sustainable Development: An Output Perspective. *Journal of Cleaner Production*, 26 (1), 28-36.
<https://doi.org/10.1016/j.jclepro.2011.12.011>
- Beynaghi, A.; Trencher, G.; Moztarzadeh, F.; Mozafari, M.; Maknoon, R.; Leal Filho, W. (2016). Future sustainability scenarios for universities: moving beyond the United Nations Decade of Education for Sustainable Development. *Journal of Cleaner Production* (112), 3464-3478. <https://doi.org/10.1016/j.jclepro.2015.10.117>
- Bizerril, M.; Rosa, M.J.; Carvalho, T.; Pedrosa, J. (2018). Sustainability in higher education: A review of contributions from Portuguese Speaking Countries. *Journal of Cleaner Production* (171), 600-612. <https://doi.org/10.1016/j.jclepro.2017.10.048>
- Blanco-Portela, N.; Benayas, J.; Pertierra, L.; Lozano, R. (2017). Towards the integration of sustainability in Higher Education Institutions. *Journal of Cleaner Production* (166), 563-578. <https://doi.org/10.1016/j.jclepro.2017.07.252>
- Bourque, L. & Clark, V. (1992). *Processing data: The survey example* (Vols. 07-085). S. Q. Sciences, Ed., Newbury Park, CA: SAGE University Applications in the Social Sciences.
- Brewerton, P. M. & Milward, L. J. (2001). *Organizational Research Methods: A Guide for Students and Researchers*, SAGE Publications Ltd.
- Brudermann, T.; Aschemann, R.; Füllsack, M.; Posch, A. (2019). Education for Sustainable Development 4.0: Lessons Learned from the University of Graz, Austria. *Sustainability*, 11(8), 2347. <https://doi.org/10.3390/su11082347>
- Bryman, A. (2012). *Social Research Methods* (4 ed.). Oxford: Oxford University Press.
- Caetano, N. & Felgueiras, M. (2018). *Advances on Sustainable Development in Higher Education. TEEM'18: Proceedings of the Sixth International Conference on Technological Ecosystems for Enhancing Multiculturality*. Salamanca: The Association for Computing Machinery (ACM). Retrieved March 10, 2019, from <https://2018.teemconference.eu>

<https://doi.org/10.1145/3284179.3284264>

Calder, W. & Clugston, R. (2003). International Efforts to Promote Higher Education for Sustainable Development. *Planning for Higher Education Journal*, 31(3).

Casarejos, F.; Gustavson, L.; Frota, M. (2017). Higher Education Institutions in the United States: Commitment and coherency to sustainability vis-à-vis dimensions of the institutional environment. *Journal of Cleaner Production* (159), 74-84.

<https://doi.org/10.1016/j.jclepro.2017.05.034>

Cebrián, G.; Grace, M.; Humphris, D. (2015). Academic staff engagement in education for sustainable development. *Journal of Cleaner Production* (106), 79-86.

<https://doi.org/10.1016/j.jclepro.2014.12.010>

Ceulemans, K., Molderez, I., Liedekerke, L. V. (2015). Sustainability reporting in higher education: a comprehensive review of the recent literature and paths for further research. *Journal of Cleaner Production* (106), 127-143.

<https://doi.org/10.1016/j.jclepro.2014.09.052>

Cicmil, S.; Gough, G.; Hills, S. (2017). Insights into responsible education for sustainable: The case of UWE, Bristol. *The International Journal of Management Education* (15), 293-305. <https://doi.org/10.1016/j.ijme.2017.03.002>

Clarke, A. & Kouri, R. (2009). Choosing an appropriate university or college environmental management system. *Journal of Cleaner Production* (17), 971-984.

<https://doi.org/10.1016/j.jclepro.2009.02.019>

Clugston, R. & Calder, W. (1999). Critical dimensions of sustainability in higher education. In Leal Filho, W. (Ed.), "Sustainability and university life", Peter Lang: Berlin, Germany, 31-46.

Conference of European Rectors (CRE) (1994). The University Charter for Sustainable Development [Carta Copernicus]. Retrieved September 3, 2017, from

<https://www.iau-hesd.net/en/organizations/copernicus>

COPERNICUS-CAMPUS (2006). Copernicus Guidelines for Sustainable Development in the European Higher Education Area: How to incorporate the principles of sustainable development into the Bologna Process. Retrieved September 3, 2017, from

<http://www.ehea.info/cid102801/sustainable-development.html>

Council of the European Union (2010). Council conclusions of 19 November 2010 on education for sustainable development. Official Journal of the European Union, 2010/C 327/05. Retrieved February 28, from [https://eur-](https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:327:0011:0014:EN:PDF)

[lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:327:0011:0014:EN:PDF](https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:327:0011:0014:EN:PDF)

CRUP (2017). [Estatuto Jurídico do Conselho de Reitores das Universidades Portuguesas]. Retrieved May 27, 2017 from

http://www.crup.pt/crup/sitecrup/wp-content/uploads/2016/10/Estatutos_Juridicos.pdf

CRUP (2017). [Quem somos?]. Retrieved May 27, 2017, from <http://www.crup.pt/>

DGES (Higher Education General Direction) (2017). [Regime geral de ensino superior público: concurso nacional de acesso]. Retrieved April 30, 2017, from

<https://www.dges.gov.pt/pt>

Direção-Geral da Saúde (DGS) & Institute for Health Metrics and Evaluation (IHME) (2018). Portugal: The Nation's Health 1990–2016: An overview of the Global Burden of Disease Study 2016 Results. Washington, USA: Seattle. Available at

http://www.healthdata.org/sites/default/files/files/policy_report/2018/PolicyReport_GBD-Portugal_2018.pdf

Disterheft A., Caeiro S., Azeiteiro U.M., Leal Filho W. (2013). Sustainability Science and Education for Sustainable Development in Universities: A Way for Transition. In: Caeiro S., Filho W., Jabbour C., Azeiteiro U. (Eds). "Sustainability Assessment Tools in Higher Education Institutions", Springer, Cham, 3-27.

https://doi.org/10.1007/978-3-319-02375-5_1

Disterheft, A., Caeiro, S., Leal Filho, W., Azeiteiro, U. M. (2016). The INDICARE-model – measuring and caring about participation in higher education’s sustainability assessment. *Ecological Indicators* (63), 172–186.

<https://doi.org/10.1016/j.ecolind.2015.11.057>

Dlouhá, J.; Glavic, P.; Barton, A. (2017). Higher Education in central European countries and critical factors for sustainability transition. *Journal of Cleaner Production* (151), 670-684. <https://doi.org/10.1016/j.jclepro.2016.08.022>

Dlouhá, J.; Huisingh, D.; Barton, A. (2013). Learning networks in higher education: universities in search of making effective regional impacts. *Journal of Cleaner Production* (49), 5-10. <https://doi.org/10.1016/j.jclepro.2013.01.034>

Dlouhá, J. & Burandt, S. (2015). Design and evaluation of learning processes in an international sustainability oriented study programme. In search of a new educational quality and assessment method. *Journal of Cleaner Production* (106), 247-258. <https://doi.org/10.1016/j.jclepro.2014.09.096>

EfS [Energy for Sustainability Initiative] (2011). Contribution for Institutional formation of University of Coimbra in interdisciplinary energy domain [Contribuição para a formação institucional da Universidade de Coimbra no domínio interdisciplinar da Energia]. Universidade de Coimbra: Coimbra, Portugal.

European Union (2016). Sustainable Development in the European Union: A Statistical Glance from the viewpoint of the UN Sustainable Development Goals. Eurostat. Retrieved February 8, 2019, from

<https://www.ecologic.eu/sites/files/publication/2016/2579-sustainable-development-in-the-eu.pdf>

European Union (n.d.). Quality Education Is Essential for Development. Retrieved January 30, 2019, from <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P8-TA-2018-0075+0+DOC+XML+V0//EN>

Farinha, C., Azeiteiro, U., Caeiro, S. (2018). Education for Sustainable Development in Portuguese Universities Institutional Framework: The key actors' opinion. *International Journal of Sustainability in Higher Education*, 19 (5), 912-941.

<https://doi.org/10.1108/IJSHE-09-2017-0168>

Farinha, C., Azeiteiro, U.M., Caeiro, S. (2017). Education for Sustainable Development Through Policies and Strategies in the Public Portuguese Higher Education Institutions. In Leal Filho, W.; Azeiteiro, U.; Alves, F. & P. Molthan-Hill (Eds.), "Handbook of Theory and Practice of Sustainable Development in Higher Education" in the series "World Sustainability Development Series", Springer, Cham, 275-290.

https://doi.org/10.1007/978-3-319-47877-7_19

Farinha, C., Caeiro, S., & Azeiteiro, U. (2019). Sustainability Strategies in Portuguese Higher Education Institutions: Commitments and Practices from Internal Insights. *Sustainability*, 11(11), 3227. MDPI AG.

<https://doi.org/10.3390/su11113227>

Farinha, C., Caeiro, S. and Azeiteiro, U. (2020), "Universities speak up regarding the implementation of sustainable development challenges: The case of Portugal", *International Journal of Sustainability in Higher Education*, 21 (3), 465-506.

<https://doi.org/10.1108/IJSHE-08-2019-0250>

Ferrer-Balas, D., Adachi, J., Banas, S., Davidson, C., Hoshikoshi, A., Mishra, A., Motodoa, Y.; Onga, M.; Ostwald, M. (2008). An international comparative analysis of sustainability transformation across seven universities. *International Journal of Sustainability in Higher Education* 9(3), 295-316.

<https://doi.org/10.1108/14676370810885907>

Figueiredo, F. & Tsarenko, Y. (2013). Is "being green" a determinant of participation in university sustainability initiatives?. *International Journal of Sustainability in Higher Education*, 14(3), 242-253. <https://doi.org/10.1108/IJSHE-02-2011-0017>

- Findler, F.; Schonherr, N.; Lozano, R.; Stacherl, B. (2019). Assessing the Impacts of Higher Education Institutions on Sustainable Development: An Analysis of Tools and Indicators. *Sustainability*, 11(1): 59. <https://doi.org/10.3390/su11010059>
- Fischer, D; Jenssen, S.; Tappeser, V. (2015). Getting an empirical hold of the sustainable university: a comparative analysis of evaluation framework across 12 contemporary sustainability assessment tools. *Assessment Evaluation Higher Education*, 40(6), 785-800. <https://doi.org/10.1080/02602938.2015.1043234>
- Foo, K.Y. (2013). A vision on the role of environmental higher education contributing to the sustainable development in Malaysia. *Journal of Cleaner Production* (61), 6-12. <https://doi.org/10.1016/j.jclepro.2013.05.014>
- Fortin, M.F., Côté, J.; Fillion, F. (2009). Fundamentos e etapas do processo de investigação. Loures: Lusodidacta – Sociedade Portuguesa de Material Didáctico, Lda.
- Fuertes-Camacho, M.; Graell-Martin, M.; Fuentes-Loss, M.; Balaguer-Fàbregas, M. (2019). Integrating Sustainability into Higher Education Curricula through the Project Method, a Global Learning Strategy. *Sustainability*, 11(3), 767. <https://doi.org/10.3390/su11030767>
- General Academy Statute (2010). General Academy Statute. n.e.
- Global Report Initiative (GRI) (2017). Retrieved November 19, 2017, from <https://www.globalreporting.org/information/sustainability-reporting/Pages/default.aspx>
- Global University Network for Innovation (GUNI) (2011). Higher Education in the World 4. Higher Education's Commitment to Sustainability: From Understanding to Action. Palgrave Macmillan, Hampshire.
- Glover A. & Peters C. (2013). A Whole Sector Approach: Education for Sustainable Development and Global Citizenship in Wales. In Caeiro S., Filho W., Jabbour C.,

- Azeiteiro U. (Eds), "Sustainability Assessment Tools in Higher Education Institutions". Springer, Cham, 205-222.
- Goni, F.; Chofreh, A.; Mukhtar, M.; Sahran, S.; Shukor, S.; Klemes, J. (2017). Strategic alignment between sustainability and information systems: A case analysis in Malaysian public Higher Education Institutions. *Journal of Cleaner Production* (168), 263-270. <https://doi.org/10.1016/j.jclepro.2017.09.021>
- Hallinger, P.& Chatpinyakoo, C. (2019). A Bibliometric Review of Research on Higher Education for Sustainable Development, 1998-2018. *Sustainability*, 11(8), 2401. <https://doi.org/10.3390/su11082401>
- Heitor, M. & Horta, H. (2016). Reforming higher education in Portugal in times of uncertainty: The importance of illities, as non-functional requirements. *Technological Forecasting & Social Change* (113), 146-156. <https://doi.org/10.1016/j.techfore.2015.09.027>
- Hopkins (2012). *Twenty years of Education*. Centre for Environment Education, 1-4.
- Hox, J.& Boeije, H. (2005). *Encyclopedia of Social Measurement*, volume I, Elsevier.
- INE (2019). INE. Retrieved February 23, 2019, from Metadata System: <http://smi.ine.pt/>
- ISCTE-IUL (2017). Home page. Retrieved May 27, 2017 from ISCTE-IUL: <https://www.iscte-iul.pt/>
- Jupp, V. (2006). *The SAGE Dictionary of Social Research Methods*. SAGE publications, London.
- Kahle, J.; Risch, K.; Wanke, A.; Lang, D. (2018). Strategic Networking for Sustainability: Lessons Learned from Two Case Studies in Higher Education. *Sustainability*, 10(12), 4646. <https://doi.org/10.3390/su10124646>
- Kapitulčinová, D; AtKisson, A; Perdue, J.; Will, M. (2018). Towards integrated sustainability in higher education e Mapping the use of the Accelerator toolset in all dimensions of university practice. *Journal of Cleaner Production* (172), 4367-4382. <https://doi.org/10.1016/j.jclepro.29017.05.050>

- Karatzoglou, B. (2013). An in-depth literature review of the evolving roles and contributions of universities to Education for Sustainable Development. *Journal of Cleaner Production* (49), 44-53. <https://doi.org/10.1016/j.jclepro.2012.07.043>
- Kościelniak, C. (2014). A consideration of the changing focus on the sustainable development in higher education in Poland. *Journal of Cleaner Production* (62), 114-119.
- Lárran Jorge, M. L.; Madueño, J. H.; Cejas, M. Y. C.; Peña, F. (2015). An approach to the implementation of sustainability practices in Spanish universities. *Journal of Cleaner Production* (106), 34-44. <https://doi.org/10.1016/j.jclepro.2014.07.035>
- Lárran Jorge, M.; Herrera, J.; Andrades, F. (2016). Measuring the linkage between strategies on sustainability and institutional forces: an empirical study of Spanish universities. *Journal of Environmental Planning and Management*, 59(6), 967-992. <https://doi.org/10.1080/09640568.2015.1050485>
- Lauder, A.; Sari, R. F.; Suwartha, N.; Tjahjono, G. (2015). Critical review of a global campus sustainability ranking: GreenMetric. *Journal of Cleaner Production* (108), 852-863. <https://doi.org/10.1016/j.jclepro.2015.02.080>
- Leal Filho, W.; Pallant, E.; Enete, A.; Richter, B.; Brandli, L.L. (2018b). Planning and implementing sustainability in higher education institutions: an overview of the difficulties and potentials. *International Journal of Sustainable Development & World Ecology*, 25:8, 713-721. <https://doi.org/10.1080/13504509.2018.1461707>
- Leal Filho, W.; Shiel, C.; Paço, A.; Mifsud, M.; Ávila, L.; Brandli, L.L.; Molthan-Hill, P.; Pace, P.; Azeiteiro, U.M.; Vargas, V.; Caeiro, S. (2019). Sustainable Development Goals and sustainability teaching at universities: Falling behind or getting ahead of the pack?. *Journal of Cleaner Production* (232), 285-294. <https://doi.org/10.1016/j.jclepro.2019.05.309>
- Leal Filho, W.; Brandli, L.L.; Becker, D.; Skanavis, C.; Kounani, A.; Sardi, C.; Papaioannidou, D.; Paco, A.; Azeiteiro, U.M.; Sousa, L.de; Raath, S.; Pretorius, R.; Shiel, C.; Vargas, V.; Trenchero, G.; Marans, R. (2017). Sustainable Development Policies as Indicators

and Pre-Conditions for Sustainability Efforts at Universities: fact or fiction?
International Journal of Sustainability in Higher Education, 19(1), 85-113.

<https://doi.org/10.1108/IJSHE-01-2017-0002>

Leal Filho, W.; Jim Wu, Y; Brandli, L.; Ávila, L.; Azeiteiro, U.M.; Caeiro, S.; Madruga, R.
(2017a). Identifying and overcoming obstacles to the implementation of sustainable
development at universities. Journal of Integrative Environmental Sciences, 14(1),
93-108. <https://doi.org/10.1080/1943815X.2017.1362007>

Leal Filho, W. (2000). Dealing with misconceptions on the concept of sustainability.
International Journal of Sustainability in Higher Education, 1(1), 9-19.

[10.1108/1467630010307066](https://doi.org/10.1108/1467630010307066)

Leal Filho, W. (2011). About the Role of Universities and their Contribution to Sustainable
Development. Higher Education Policy, 24(4), 427-438.

Leal Filho, W. (2015). "Sustainability 2.0" a new age of sustainable development in higher
education. International Journal of Sustainability in Higher Education, 16(1).

<https://doi.org/10.1108/IJSHE-10-2014-0149>

Leal Filho, W.; Azeiteiro, U.; Alves, F.; Pace, P.; Mifsud, M.; Brandli, L.; Caeiro, S.;
Disterheft, A. (2018). Reinvigorating the sustainable development research agenda:
the role of the sustainable development goals (SDG). International Journal of
Sustainable Development & World Ecology, 25(2), 131-142.

<https://doi.org/10.1080/13504509.2017.1342103>

Leal Filho, W.; Raath, S.; Lazzarini, B., Vargas, V.R.; Souza, L.; Anholon, R.; Quelhas, O.L.G.;
Haddad, R.; Klavins, M.; Orlovic, .L. (2018a). The role of transformation in learning
and education for sustainability. Journal of Cleaner Production, 199, 286-295.

<https://doi.org/10.1016/j.jclepro.2018.07.017>

Lee, K., Barker & M., Mouasher, A. (2013). Is it even espoused? An exploratory study of
commitment to sustainability as evidenced in vision, mission, and graduate

- attribute statements in Australian universities. *Journal of Cleaner Production*, 48(10), 20-28 .
- Lotz-Sisitka, H. (2004). Stories of transformation. *Journal of Sustainability in Higher Education*, 5(1), 8-10. <https://doi.org/10.1108/14676370410512553>
- Lozano, R. (2010). Diffusion of sustainable development in universities curricula: an empirical example from Cardiff University. *Journal Clean Production*, 18(10), 637-644. <https://doi.org/10.1016/j.jclepro.2009.07.005>
- Lozano, R. (2008). Envisioning sustainability three-dimensionally. *Journal of Cleaner Production* (16), 1838–1846. <https://doi.org/10.1016/j.jclepro.2008.02.008>
- Lozano, R. (2006). Incorporation and institutionalization of SD into universities. *Journal of Cleaner Production*, 14, 787-796. <https://doi.org/10.1016/j.jclepro.2005.12.010>
- Lozano, R. (2003). Sustainable development in higher education. Incorporation, assessment and reporting of sustainable development in higher education institutions. Master Thesis, Lund University, Lund.
- Lozano, R, & Barreiro-Gen, M. (2019). Analysing the factors affecting the incorporation of sustainable development into European Higher Education Institutions' curricula. *Sustainable Development*, 27 (5), 965–975. <https://doi.org/10.1002/sd.1987>
- Lozano, R., Barreiro-Gen, M., Lozano, F. & Sammalisto, K. (2019). Teaching Sustainability in European Higher Education Institutions : Assessing the Connections between Competences and Pedagogical Approaches. *Sustainability*, 11 (6).
<https://doi.org/10.3390/su11061602>
- Lozano, R.; Ceulemans, K.; Alonso-Almeida, M.; Huisingh, D.; Lozano, F.; Waas, T.; Lambrechts, W.; Lukman, R.; Hugé, J. (2015). A review of commitment and implementation of sustainable development in higher education: results from worldwide survey. *Journal of Cleaner Production* (108), 1-18.
<https://doi.org/10.1016/j.jclepro.2014.09.048>

Lozano, R.; Lozano, F.; Mulder, K., Huisingh, D., Waas, T. (2013a). Advancing Higher Education for Sustainable Development: International Insights and Critical Reflections. *Journal of Cleaner Production*, 48, 3-9.

<https://doi.org/10.1016/j.jclepro.2013.03.034>

Lozano, R.; Lukman, R.; Lozano, F.; Huisingh, D.; Lambrechts, W. (2013). Declarations for sustainability in higher education: becoming better leaders, through addressing the university system. *Journal of Cleaner Production* (48), 10-19.

<https://doi.org/10.1016/j.jclepro.2011.10.006>

McCowan, T. (2016). Universities and the post-2015 development agenda: an analytical framework. *Higher Education*, 72(4), 505-523.

<https://doi.org/10.1007/s10734-016-0035-7>

McNabb, D. (2015). *Research Methods for Political Science: Quantitative and Qualitative methods*. Routledge. ISBN 9780765623133.

Ministry of Science and Higher Education [Ministério da Ciência, Ensino Superior] (2010). *A trust agreement in higher education for the future of Portugal: Investing in the future [Um contrato de confiança no Ensino Superior para o futuro de Portugal: Investir no futuro (2010-2013)]*. Lisboa: MCTES.

MIT Portugal (2017). MIT Portugal. Retrieved April 8, 2007, from

<https://www.mitportugal.org/>

Mota, I.; Pinto, M.; Vasconcelos e Sá, J.; Ribeiro, F.; Quintas, E.; Soromenho-Marques, V. (2005). *National Strategy for Sustainable Development 2005/2015: A project for Portugal*. Lisboa: Pandora.

National Education Council [Conselho Nacional de Educação - CNE] (2012). *State of Education 2012: Autonomy and Decentralization [Estado da Educação 2012: Autonomia e Descentralização]*. Lisboa, Portugal: CNE.

OECD. (2003). *Business Tendency Surveys: A Handbook*. OECD Publishing.

- Orr (1994). *Earth in mind: on education, environment and the human prospect*. Education for Environmental Sustainability: Making it work in practice. Washington: Island Press. Retrieved September 26, 2014, from https://uwosh.edu/sirt/wp-content/uploads/sites/86/2017/08/Orr_Earth-in-Mind.pdf
- Pace, P. (2016). Education for Sustainable Development at Higher Education Institutions: a critique. *Journal of Baltic Science Education* (15), 268-270.
- Portuguese Institute for Development Support [Instituto Português de Apoio ao Desenvolvimento] (2009). *National Strategy for Development Education (2010-2015) [Estratégia Nacional de Educação para o Desenvolvimento]*. Lisboa, IPAD.
- Pradhan, M.& Mariam, A. (2014). The Global Universities Partnership on Environment and Sustainability (GUPES): Networking of Higher Educational Institutions in Facilitating Implementation of the UN Decade of Education for Sustainable Development 2005–2014. *Journal of Education for Sustainable Development*, 8 (2), 171-175. <https://doi.org/10.1177/0973408214548383>
- QRS International. NVIVO10 and NVIVO 11. Retrieved October 8, 2016, from <https://www.qsrinternational.com/>
- Ramísio, P.; Pinto, L; Gouveia, N.; Costa, H.; Arezes, D. (2019). Sustainability Strategy in Higher Education Institutions: Lessons learned from a nine-year case study. *Journal of Cleaner Production*, 222, 300-309. <https://doi.org/10.1016/j.jclepro.2019.02.257>
- Ramos, T.; Montañó, M.; Joanaz de Melo, J.; Souza, M.; Carvalho de Lemos, C.; Domingues, A.; Polido, A. (2015). Strategic Environmental Assessment in Higher Education: Portuguese and Brazilian cases. *Journal of Cleaner Production* (106), 222-228. <https://doi.org/10.1016/j.jclepro.2014.12.088>

- Republic Assembly (2007). Law n. 62/2007, 10th September. Retrieved September, 10 2017, from <https://dre.pt/RJIES>
- Republic Assembly (2008). National Action Plan for Energetic Efficiency (PNEE). In Republic Diary. Lisboa: Republic Assembly. Retrieved September 10, 2017, from <https://dre.pt/PNEE>
- Republic Assembly (2010). National Action Plan for Renewable Energies (PNER). In Republic Diary. Lisboa: Republic Assembly. Retrieved September 10, 2017, from <https://dre.pt/PNER>
- Republic Assembly (2011). Energetic Efficiency Programme in the Public Administration (Eco.AP). In Ministers Council Resolution n. 2/2011. Lisbon: Republic Assembly. Retrieved September 10, 2017, from <https://dre.pt/Eco.AP>
- Republic Assembly (2015). Retrieved October 14, 2015, from <https://www.parlamento.pt/>
- Sachs, J., Schmidt-Traub, G., Kroll, C., Durand-Delacre, D. and Teksoz, K. (2017): SDG Index and Dashboards Report 2017. New York: Bertelsmann Stiftung and Sustainable Development Solutions Network (SDSN). Retrieved February 8, 2019 from <https://s3.amazonaws.com/sustainabledevelopment.report/2017/>
- Salvia, A.; Leal Filho, W.; Brandli, L.; Griebeler, J. (2019). Assessing research trends related to Sustainable Development Goals: local and global issues. *Journal of Cleaner Production*, 208, 841-849. <https://doi.org/10.1016/j.jclepro.2018.09.242>
- Saunders, M; Lewis, P.; Thornhill, A. (2009). *Research methods for business students* (5th edition ed.). Harlow, England: Prentice Education Limited.
- Schmidt, L.; Nave, J.; O' Riordan, T.; Guerra, J. (2011). Trends and Dilemmas Facing Environmental Education in Portugal: From Environmental Problem Assessment to

Citizenship Involvement. *Journal of Environmental Policy and Planning*, 13(2), 159-177.

<https://doi.org/10.1080/1523908X.2011.576167>

Sedlacek, S. (2013). The role of universities in fostering sustainable development at the regional level. *Journal of Cleaner Production*, 74-84.

<https://doi.org/10.1016/j.jclepro.2013.01.029>

Shi, H. & Lai, E. (2013). An alternative university sustainability rating framework with a structured criteria tree. *Journal of Cleaner Production* (61), 59-69.

<https://doi.org/10.1016/j.jclepro.2013.09.006>

Shiel, C., Leal Filho, W., Paço, A., Brandli, L. (2016). Evaluating the engagement of universities in capacity building for sustainable development in local communities. *Evaluation and Program Planning* (54), 123-134.

<https://doi.org/10.1016/j.evalprogplan.2015.07.006>

Shriberg, M. & Harris, K. (2012). Building sustainability change management and leadership skills in students: lessons learned from “Sustainability and the Campus” at the University of Michigan. *Journal of Environmental Studies and Sciences* (2), 154-164. <https://doi.org/10.1007/s13412-012-0073-0>

Sinakou, E; Boeve-de Pauw, J., Petegem, P. (2019). Exploring the concept of SD within EDS: implications for ESD research and practice. *Environment, Development and Sustainability* (21), 1–10. <https://doi.org/10.1007/s10668-017-0032-8>

Soini, K; Jurgilevich, A.; Pietikäinen, J.; Korhonen-Kurki, K. (2018). Universities responding to the call for sustainability: a typology of sustainability centers. *Journal of Cleaner Production* (170), 1423-1432. <https://doi.org/10.1016/j.jclepro.2017.08.228>

Sonetti, G.; Brown, M.; Naboni, E. (2019). About the Triggering of UN Sustainable Development Goals and Regenerative Sustainability in Higher Education. *Sustainability*, 11(1), 254. <https://doi.org/10.3390/su11010254>

- Spangenberg, J.H. (2018). Behind the Scenarios: World View, Ideologies, Philosophies. An Analysis of Hidden Determinants and Acceptance Obstacles Illustrated by the ALARM Scenarios. *Sustainability*, 10(7), 2556. <https://doi.org/10.3390/su10072556>
- Stough, T.; Ceulemans, K.; Lambrechts, W.; Cappunys, V. (2018). Assessing sustainability in higher education curricula: A critical reflection on validity issues. *Journal of Cleaner Production*, 172, 4456-4466. <https://doi.org/10.1016/j.jclepro.2017.02.017>
- Tastle, W. & Wierman, M. (2007). Consensus and dissention: A measure of ordinal dispersion. *International Journal of Approximate Reasoning*, 45(3), 531-545. <https://doi.org/10.1016/j.ijar.2006.06.024>
- Teixeira, P. & Koryakina, T. (2016). Political Instability, Austerity and Wishful Thinking: Analyzing Stakeholders' Perceptions of Higher Education's Funding Reforms in Portugal. *European Journal of Education: Research, Development and Policy*, 51 (1), 126-139. <https://doi.org/10.1111/ejed.12126>
- Times Higher Education (THE) (2020). Retrieved March 6, 2020, from <https://www.timeshighereducation.com/blog/were-including-all-17-sdgs-2020-university-impact-rankings>.
- Tilbury, D. (2004). Environmental education for sustainability: A force for change in higher education. In A. & Corcoran, Higher education and the challenges of sustainability problematics, promise, and practice, 97-112. Netherlands: Kluwer Academic Publishers.
- Tilbury, D. & Mulà, I. (2009). A Review of education for sustainable development policies from a cultural diversity and intercultural dialogue perspective: identifying opportunities for future action. ISBN:978-1-86174-200-1. Paris: UNESCO. Retrieved October 14, 2015, from <https://unesdoc.unesco.org/ark:/48223/pf0000211750>
- Ulisboa (2014). Action Plan 2014-2017: Proposal of the Rector to the General Council; ULisboa: Lisbon, Portugal.

- UNESCO (2014). Aichi-Nagoya Declaration on Education for Sustainable Development. ED/2014/TLC/ESD/01. Paris: UNESCO. Retrieved July 10, 2017, from <https://unesdoc.unesco.org/ark:/48223/pf0000231074>
- UNESCO (2012). Education for sustainable development: sourcebook. ISBN: 978-92-3-001063-8, 978-92-3-001157-4 (ara). Paris: UNESCO. Retrieved April 20, 2019, from <https://unesdoc.unesco.org/ark:/48223/pf0000216383>
- UNESCO (2012a). United Nations Decade of Education for Sustainable Development (2005-2014). Exploring Sustainable Development: A Multiple-Perspective Approach. Education for Sustainable Development in Action. Learning & Training Tools, 3. ED/PSD/ESD/2012/PI/1. Paris: UNESCO. Retrieved September 10, 2017 from <https://unesdoc.unesco.org/ark:/48223/pf0000215431>
- UNESCO (2005). United Nations Decade of Education for Sustainable Development (UN DESD 2005-2014): International Implementation Scheme. ED/DESD/2005/PI/01. Paris: UNESCO. Retrieved April 29, 2016, from <http://unesdoc.unesco.org/images/0014/001486/148654E.pdf>
- UNESCO National Commission Forum – Portugal. (2006). Decade of United Nations for Education for Sustainable Development: Contributions for its dinamization in Portugal [Década das Nações Unidas para a Educação para o Desenvolvimento Sustentável: contribuições para a sua dinamização em Portugal]. Lisboa.
- United Nations (2016). Climate Change. Retrieved January 27, 2018, from http://unfccc.int/paris_agreement/items/9485.php
- United Nations (2018). Draft Outcome Document of the United Nations Summit for the Adoption of the Post-2015 Development Agenda. Retrieved January 3, 2018, from <https://sustainabledevelopment.un.org/post2015/summit>
- United Nations (2017). Higher Education Sustainable Initiative. Sustainable Development Knowledge Platform. Retrieved September 8, 2017, from <https://sustainabledevelopment.un.org/sdinaction/hesi>

United Nations (2015). Sustainable development goals. Retrieved January 27, 2018, from Sustainable development/sustainable-development goals:

<https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

Universidade Aberta (UAb) (2013). Activity Report 2013. Retrieved September 15, 2015, from www.uab.pt

Universidade Aberta (UAb) (2015). Homepage. Retrieved December 19, 2015, from

<http://portal.uab.pt/en/auab/>

Universidade Católica Portuguesa (UCP) (2017). Institutional introduction. Retrieved September 27, 2017, from <https://www.ucp.pt>

Universidade da Beira Interior (UBI) (2010). Strategical Plan 2010-2020. Retrieved September 15, 2016, from www.ubi.pt

Universidade da Beira Interior (UBI) (2011). Activity and Account Plan 2011. Retrieved September 11, 2015, from www.ubi.pt

Universidade da Beira Interior (UBI) (2013). Activity Plan 2013. Retrieved September 29, 2015, from www.ubi.pt

Universidade da Beira Interior (UBI) (2017). History. Retrieved September 22, 2017, from www.ubi.pt

Universidade de Aveiro (UA) (2018). Home page. Retrieved September 30, 2018, from <http://www.ua.pt>

Universidade de Coimbra (UC) (2011). Contribution for Institutional formation of University of Coimbra in interdisciplinary energy domain. Energy for Sustainability. Coimbra: Universidade de Coimbra.

Universidade de Coimbra (UC) (2018). Homepage. Retrieved September 16, 2018, from <http://www.uc.pt/en/international>

Universidade de Évora (UÉ) (2018). General description of university. Retrieved April, 17 2018, from <http://www.en.mobilidade.uevora.pt/University/General-description-of-university>

- Universidade de Évora (UÉ) (2019). Homepage. Retrieved January 23, 2019, from www.ue.pt
- Universidade de Trás os Montes and Alto Douro (UTAD) (2018). Homepage. Retrieved April 23, 2018, from <https://www.utad.pt/en/university/>
- Universidade do Minho (UMinho) (2011). Sustainability Report 2011. Retrieved December 19, 2015, from www.uminho.pt
- Universidade do Minho (UMinho) (2013). Sustainability Report 2012-2013. Retrieved December 19, 2015, from www.uminho.pt
- Universidade do Minho (UMinho) (2019). Homepage. Retrieved January 20, 2019, from www.uminho.pt
- Universidade do Porto (UP) (2010). Sustainability Report 2010. Retrieved December 19, 2015 from www.up.pt
- Universidade do Porto (UP) (2015). Environmental Paper Network. Retrieved December 19, 2015 from www.papercalculator.org
- Universidade dos Açores (UAc) (2018). História. Retrieved May 27, 2018, from <http://novoportal.uac.pt/pt-pt/historia>
- Universidade Nova de Lisboa (UNL) (2018). Home/Nova/History. Retrieved May 9, 2018, from <http://www.unl.pt/en/nova/history>.
- USFL (2018). Sustainability-assessment-questionnaire (SAQ). Retrieved March 24, 2018, from <http://ulsf.org/sustainability-assessment-questionnaire/>
- Vargas, V.; Lawthom, R.; Prowse, A.; Randles, S.; Tzoulas, K. (2019). Sustainable development stakeholder networks for organisational change in higher education institutions: A case study from the UK. *Journal of Cleaner Production* (208), 470-478. <https://doi.org/10.1016/j.jclepro.2018.10.078>
- Velazquez, L., Munguia, N., Sanchez, M. (2005). Deterring sustainability in higher education institutions: An appraisal of the factors which influence sustainability in

higher education institutions. *International Journal of Sustainability in Higher Education*, 6(4), 383-391. DOI: 10.1108/14676370510623865.

<https://doi.org/10.1108/14676370510623865>

Verhulst, E. & Lambrechts, W. (2015). Fostering the incorporation of sustainable development in higher education: Lessons learned from a change management perspective. *Journal of Cleaner Production* (106), 189-204.

<https://doi.org/10.1016/j.jclepro.2014.09.049>

Waas, T. H. (2012). *Sustainable Higher Education: Understanding and Moving Forward*. Environment, Nature and Energy Department. Brussels.

Wals, A. (2014). Sustainability in higher education in the context of the UN DESD: a review of learning and institutionalization processes. *Journal of Cleaner Production* (62), 8-15. <https://doi.org/10.1016/j.jclepro.2013.06.007>

WCED (1987). *Our common future*. Oxford: Oxford University Press.

Zilhão, M.; Morais, V.; Ribeiro, M.; Pacheco, S. (2008). The use of customer satisfaction surveys in assessing quality in statistics: The experience of the National Statistical. Retrieved February 23, 2019, from

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.542.643&rep=rep1&type=pdf>

Zutsh, A.; Creed, A. (2018). Declaring Taillores: Profile of sustainability communications in Australia signatory universities. *Journal of Cleaner Production* (187), 687-698.

<https://doi.org/10.1016/j.jclepro.2018.03.225>

APPENDICES

APPENDIX A
Letters of invitation requesting interviews
(Chapters 2 and 4)

LETTER OF INVITATION ADDRESSED TO THE KEYACTORS REQUESTING AN INTERVIEW

CHAPTER 2

Carla Sofia Farinha
Aluna de Doutoramento
Universidade Aberta

Exmo(a) Senhor(a)
[Nome]
[Cargo]
[Instituição]
[Endereço]
[Endereço]

Lisboa, [aaaa-mm-dd]

Assunto: Pedido de entrevista para tese de doutoramento

Exmo. Sr. [...],

Após ter obtido o seu contacto através do [...], agradeço a sua disponibilidade para colaborar na minha tese de doutoramento sobre a “Aplicação da sustentabilidade nas políticas públicas e estratégias do Ensino Superior Universitário Português: Balanço de 10 anos de DEDS”.

Pelo facto da [XXX] ter tido um papel-chave na Educação para o Desenvolvimento Sustentável, “trabalhando” as matérias da “Educação e Ambiente” (conjuntamente ou de forma isolada), pretende-se saber se e como o “Ministério da Ciência, Tecnologia e Ensino Superior” (e Ministério da Educação) e mais tarde (até finais de 2015), designado “Ministério da Educação e Ciência” (fundindo os Ensinos e a Ciência, e a Tecnologia) aplicou o desenvolvimento sustentável, a sustentabilidade, a gestão ambiental (conceitos cada vez mais utilizados desde que a UNESCO proclamou a “UN Decade of Education for Sustainable Development (DESD) 2005–2014”) nas Instituições de Ensino Superior (e se o fez, de que forma).

Assim, a fase seguinte da minha investigação, após ter já realizado a análise documental é, com a sua colaboração, entre outros actores-chave, proceder à realização de entrevista semiestruturada.

A entrevista poderá ocorrer em [...], onde eventualmente será mais fácil para si, ou em outro local a determinar, e que lhe for mais conveniente, em dia e hora a combinar.

Agradeço, a disponibilidade para colaborar, e deixo o meu contacto de mail, móvel, caso seja mais operacional para qualquer questão,

Aguardando uma resposta, subscrevo-me com consideração
Atenciosamente,

Carla Sofia Farinha
Aluna de doutoramento da Universidade Aberta; CENSE (FCT/UNL)

Mail: carlasofia.farinha@gmail.com/carlafarinha@dgs.pt | <https://pt.linkedin.com/pub/carla-farinha/22/193/340> | TM.: 961 770 XXX

**LETTER OF INVITATION ADDRESSED TO THE KEYACTORS RESPONSIBLE FOR IMPLEMENTATION
OF SUSTAINABILITY IN EACH UNIVERSITY**

CHAPTER 4

Carla Sofia Farinha
Aluna de Doutoramento
Universidade Aberta

Exmo(a) Senhor(a)
[Nome]
[Cargo]
[Instituição]
[Endereço]
[Endereço]

Lisboa, [aaaa-mm-dd]

Assunto: Sustentabilidade no ensino superior pedido de entrevista para tese de doutoramento

Exmo. Sr. [...],

Estou a realizar a tese de doutoramento sobre a “Aplicação da sustentabilidade nas políticas públicas e estratégias do Ensino Superior Universitário Português: Balanço de 10 anos de DEDS (Desenvolvimento da Educação para o Desenvolvimento Sustentável)” sob orientação da Prof. Sandra Caiiro da UAb e do Prof. Ulisses Azeiteiro da UA.

Pelo facto de ser [XXX] da IES [XXX] e ter trabalhado ou trabalhar as matérias relacionadas com o Desenvolvimento Sustentável, e sua relação com a Educação, gostaria de contar (muito) com a sua colaboração na fase final da elaboração da minha Tese. Nesta fase pretende-se saber de que forma as Universidades, no caso [XXX], de 2005 a 2014 (e mesmo após este período) implementou a sustentabilidade, no âmbito da Educação para o Desenvolvimento Sustentável através da aplicação de guião de entrevista.

Esta é a última fase delineada para a minha tese, sendo que em anteriores fases conclui-se que, apesar de não terem existido estratégias e políticas nacionais integradas ou concertadas relativamente à Educação para o Desenvolvimento Sustentável, os resultados apontam para que o movimento tenha ocorrido ao nível das universidades, com bons exemplos e iniciativas em algumas destas instituições públicas portuguesas.

Perante o exposto, o meu próximo passo será solicitar a sua melhor colaboração para que o possa entrevistar. Para tal, eventualmente, será mais fácil, um encontro presencial.

Desde já, adianto que seria ideal a semana de [XXX], no local e data que melhor lhe convier. Eu ajustar-me-ei certamente, sem problema.

Agradeço, a disponibilidade para colaborar, e deixo o meu contacto de mail, móvel, caso seja mais operacional para qualquer questão,

Aguardando uma resposta, subscrevo-me com consideração
Atenciosamente,

Carla Sofia Farinha
Aluna de doutoramento da Universidade Aberta; CENSE (FCT/UNL)

Mail: carlasofia.farinha@gmail.com/carlafarinha@dgs.pt | <https://pt.linkedin.com/pub/carla-farinha/22/193/340> | TM.: 961 770 XXX

APPENDIX B

Interview Scripts
(Chapters 2 and 4)

B.1. THE INTERVIEW SCRIPT (WITH RESEARCH QUESTIONS) USED IN CHAPTER #2

INTERVIEW SCRIPT KEY ACTOR

Date: _____ Beginning: __h:__m End: __h:__m

Name: _____ Institution: _____

Key Actor role in Institution: _____

Governmental implementation

Q1.

According to 2005 International Implementation Scheme, the Education for Sustainable Development Decade (2005-2014) should have been implemented by Member States. From your point of view, did the Portuguese Government integrate the sustainability in their plans, programs or policies?

Yes

No

*I don't know/I don't
want to answer*

Q1.a. *If Yes, how? If No go to Q3 (note: if the respondent is willing to add relevant information fill below)*

Q1.b. *Which are the documents?*

Q2.

Who were the intervenient in the sustainability implementation process in the Governmental plans, programs or policies?

Ministry/DESD 2005-2014 Portugal/Portuguese University Rectors Council implementation

Q3.

Did the Ministry (or Secretary of State)/General Direction of Higher Education/DESD 2005-2014 in Portugal/Portuguese University Rectors Council develop any strategy to implement sustainability in their plans, programmes or policies?

Yes

No

I don't know/I don't want to answer

Q3.a. *If Yes, how? If, No go to question 5 (note: : if the respondent is willing to add relevant information fill below)*

Q3.b. *Which are the documents?*

Q4.

Who were the intervenient in the sustainability implementation process at Ministry (or Secretary of State)/General Direction of Higher Education/DESD 2005-2014 in Portugal/Portuguese University Rectors Council?

HEI implementation

Q5.

Did Public HEI integrate the sustainability implementation process from the Ministry in their plans, programs or policies?

Yes

No

I don't know/I don't want to answer

If Yes, how (go to **Q5.a**)? If No go to **Q5.b** (note: if the respondent is willing to add relevant information fill below)

Q5.a. Was it by transposing directly to HEI Strategic Plans?

Yes	No	I don't know/I don't want to answer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q5.b. If so (Yes), how? If, No (go to question 5.c., except if the respondent is willing to add relevant information)

Q5.c. Was it by transposing directly to HEI Activity Plans?

Yes	No	I don't know/I don't want to answer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q5.d. If so (Yes), how? If, No (go to question 5.e., except if the respondent is willing to add relevant information)

Q5.e. With any kind of alterations?

Yes	No	I don't know/I don't want to answer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q5.f. If so (Yes), which (go to question 5.g); if, No (go to question 5.h, except if the respondent is willing to add relevant information)

Q5.g. Without neither transposing Strategic or Activity Plans nor alterations?

Yes	No	I don't know/I don't want to answer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q5.h. If so (Yes), how? If, No (gather any relevant information the respondent is willing to add)

DESD 2005-2014 impact in the Portuguese society

Q6.

In your opinion how did DESD 2005-2014 have impact in the Portuguese society?

Yes	No	I don't know/I don't want to answer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

UNESCO National Commission Forum-DESD (2005-2014): Contributions for its dynamization in Portugal (2006)

Q7.

Do you know the document "UNESCO National Commission Forum-DESD (2005-2014): Contributions for its dynamization in Portugal (2006)" coordinated by Professor Luisa Schmidt?

Yes	No	I don't know/I don't want to answer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q8.

Do you know any people that had an important role in these areas, namely in the leading processes that I should interview?

END

B.2. THE INTERVIEW SCRIPT (WITH RESEARCH QUESTIONS) USED IN CHAPTER #4

INTERVIEW SCRIPT

Date: _____ Beginning: __h: __m End: __h: __m

Name: _____ Position: _____

Institution: _____

INTRODUCTION

[To read loud to each interviewee before the interview]

Considering UN Development of Education for Sustainable Development 2005-2014, the definitions of Sustainable Development (SD), Education for Sustainable Development (ESD) and sustainability [they were read to the interviewee – see downwards] please answer the questions as accurately as you can.

This interview is seeking your impressions and opinions, so you need not have detailed information on all subjects offered (HEI educational offer), recycling programs, etc., to answer it.

Thank you in advance.

Definitions of sustainable development, education for sustainability and sustainability:

Sustainable development (SD) is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987).

Education for sustainable development (ESD) is a dynamic concept that utilizes all aspects of public awareness, education and training to create or enhance an understanding of the linkages among the issues of sustainable development and to develop the knowledge, skills, perspectives and values which will empower people of all ages to assume responsibility for creating and enjoying a sustainable future (United Nations, UNESCO (2005)).

Sustainability (S) – which, at a minimum, addresses how humans can live on the planet over time in a manner that protects cultural and biological diversity, recognizes and appreciates ecological limits, offers just and accountable governments and economies for all and draws on the human capacity for adaptive learning and innovation – offers a tremendous challenge for education. It requires educational institutions to rethink their missions and to challenge for education. It requires educational institutions to rethink their missions and to re-structure their courses, research priorities, community outreach, and campus operations (Glasser, H.; Calder, W. and Fadeeva, Z., 2005).

2.1.2. Was/Is there a policy for implementing SD in your UHEI?

Yes (explicitly mentioned as environmental or social issues)	Yes (explicitly written)	No	I don't know/I don't want to answer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If Yes, please provide examples

2.1.3. Was/Is there a Strategic Plan for implementing sustainability in your HEI?

Yes	No	I don't know/I don't want to answer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.1.4. Was/Are there any Staff members (Rectoral Team, Teachers, Non-teaching Staff) dedicated to SD?

Yes	No	I don't know/I don't want to answer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.1.5. Was/Is there a SD Working Group?

Yes	No	I don't know/I don't want to answer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.1.6. Did/Do your UHEI have a SD office (dedicated to SD/ESD/Sustainability)?

Yes (explicitly mentioned as environmental or social issues)	Yes (explicitly written)	No	I don't know/I don't want to answer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If Yes, please provide examples

2.1.7. Was/Is SD considered in the Q&A procedures?

Yes	No	I don't know/I don't want to answer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.1.8. Did/do the University Leaders provide a SD budget or in-kind support?

Yes	No	I don't know/I don't want to answer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.2. CAMPUS OPERATIONS

(energy use and energy efficiency, greenhouse gases, waste, water and water management, food purchasing, transport, accessibility for disabled people, and equality and diversity)

2.2.1. SD implementation actions during UN DESD 2005-2014

Please indicate the extent to which your institution has implemented each SD action during UN DESD 2005-2014 using the following scale:

1 – Strongly disagree; 2 – disagree; 3 – Undecided; 4 – agree; 5 - Strongly agree and 8 – not applicable and 9 – I don't know/I don't want to answer.

Concerning each SD implementation action comment or give examples on SD initiatives that might had happened in your University.

<i>*Please rate your responses from 1-5 or 8 or 9</i>	<i>DESD* 2005-2014</i>	<i>Please comment or give examples on SD initiatives</i>	<i>Present*</i>	<i>Please comment or give examples on SD initiatives</i>
<i>Plans to improve energy efficiency</i>				
<i>Energy efficient equipment</i>				
<i>Renewable energy usage</i>				
<i>Plans and efforts to reduce GHG emissions</i>				
<i>Plans to improve prevention and management waste</i>				
<i>Plans to prevent management waste</i>				
<i>Plans to improve management waste</i>				
<i>Waste bins for separation</i>				
<i>Waste bins for recycling waste</i>				
<i>Plans for water and wastewater management</i>				
<i>Management of toxic materials and radioactive waste</i>				
<i>Reduction of toxic materials and radioactive waste</i>				
<i>Sustainable food/dietary practices</i>				
<i>Purchase of locally produced food products</i>				
<i>Promotion of organic food products</i>				
<i>Promotion of Fair Trade Products</i>				
<i>Promotion of sustainable modes of transport</i>				
<i>Access and facilities for disable people</i>				
<i>Policies for equality and diversity</i>				
<i>Policies and activities to reduce paper consumption</i>				
<i>Building construction and renovation based on green design principles - achieving LEED - Leadership in Energy and Environmental Design</i>				
<i>Sustainable landscaping</i>				
<i>Green purchasing from environmentally and socially responsible companies</i>				
<i>Environmental or sustainability assessments/audits</i>				
<i>Biodiversity</i>				

2.2.2. SD implementation actions at present time

2.3. EDUCATION

(courses on SD, programmes on SD, transdisciplinary, curricular reviews, including 'Educate-the-educators' programmes)

2.3.1. SD implementation actions during UN DESD 2005-2014

Please indicate the extent to which your institution has implemented each SD action during UN DESD 2005-2014 using the following scale:

1 – Strongly disagree; 2 – disagree; 3 – Undecided; 4 – agree; 5 - Strongly agree and 8 – not applicable and 9 – I don't know/I don't want to answer.

Concerning each SD implementation action comment or give examples on SD initiatives that might had happened in your University.

<i>*Please rate your responses from 1-5 or 8 or 9</i>	<i>DESD* 2005-2014</i>	<i>Please comment or give examples on SD initiatives</i>	<i>Present*</i>	<i>Please comment or give examples on SD initiatives</i>
<i>Disciplines and/or courses on SD for all students</i>				
<i>Optional courses on SD in the curriculum</i>				
<i>SD major at the Bachelor's level</i>				
<i>SD major at the Master's level</i>				
<i>SD major at the PhD's level</i>				
<i>Promotion of holistic and systemic thinking in teaching</i>				
<i>Possibility for students to take classes in other faculty (by modules)</i>				
<i>Invited lectures/professors on SD</i>				
<i>SD education for lectures/teachers</i>				
<i>Teaching across (fostering the link between) the natural sciences and social sciences faculties</i>				
<i>Continuing education to the public on SD</i>				

2.3.2. SD implementation actions at present time

2.4. RESEARCH

(research centers, research funding, holistic thinking, international recognition, SD research used in teaching, publications, patents, new knowledge and technologies, collaboration, and transdisciplinary)

2.4.1. SD implementation actions during UN DESD 2005-2014

Please indicate the extent to which your institution has implemented each SD action during UN DESD 2005-2014 using the following scale:

1 – Strongly disagree; 2 – disagree; 3 – Undecided; 4 – agree; 5 - Strongly agree and 8 – not applicable and 9 – I don't know/I don't want to answer.

Concerning each SD implementation action comment or give examples on SD initiatives that might had happened in your University.

<i>*Please rate your responses from 1-5 or 8 or 9</i>	<i>DESD* 2005-2014</i>	<i>Please comment or give examples on SD initiatives</i>	<i>Present*</i>	<i>Please comment or give examples on SD initiatives</i>
<i>(Having a) SD Institute or Research Centre</i>				
<i>(Providing) Funding for SD Research</i>				
<i>Promotion of holistic and systemic thinking in teaching</i>				
<i>Use of research generated in SD teaching</i>				
<i>Publications on SD</i>				
<i>Patents in the field of SD</i>				
<i>Using SD research in the teaching</i>				
<i>Teaching across (fostering the link between) the natural sciences and social sciences faculties</i>				

2.4.2. SD implementation actions at present time

2.5. OUTREACH AND COLLABORATION

(exchange programmes for students in the field of SD, joint degrees with other universities, joint research, SD partnerships (e.g. enterprises, non-governmental organizations, and governments), being part of a UN Regional Centre of Expertise (RCE), and SD events open to the community. This aspect is the act of extending services, benefits, among others to a wider section of the population, as in community work)

2.5.1. SD implementation actions during UN DESD 2005-2014

Please indicate the extent to which your institution has implemented each SD action during UN DESD 2005-2014 using the following scale:

1 – Strongly disagree; 2 – disagree; 3 – Undecided; 4 – agree; 5 - Strongly agree and 8 – not applicable and 9 – I don't know/I don't want to answer.

Concerning each SD implementation action comment or give examples on SD initiatives that might had happened in your University.

<i>*Please rate your responses from 1-5 or 8 or 9</i>	<i>DESD* 2005-2014</i>	<i>Please comment or give examples on SD initiatives</i>	<i>Present*</i>	<i>Please comment or give examples on SD initiatives</i>
Exchange programmes in SD				
Joint SD degrees with other Universities				
Joint SD research with other Universities				
Collaboration in SD research projects with other universities				
SD partnerships with other society stakeholders				
Part of a UN Regional Centre of Expertise (RCE)				
Part of interdisciplinary SD expert networks				
Academic staff involved in voluntary advisory activities in SD				
SD events that are open to the public/community				

2.5.2. SD implementation actions at present time

2.6. SD THROUGH ON-CAMPUS EXPERIENCES

(SD working group, SD policies for students and staff, sustainable practices for students, SD visibility throughout the campus, SD awareness raising in the campus, and student and staff engagement)

2.6.1. SD implementation actions during UN DESD 2005-2014

Please indicate the extent to which your institution has implemented each SD action during UN DESD 2005-2014 using the following scale:

1 – Strongly disagree; 2 – disagree; 3 – Undecided; 4 – agree; 5 - Strongly agree and 8 – not applicable and 9 – I don't know/I don't want to answer.

Concerning each SD implementation action comment or give examples on SD initiatives that might had happened in your University.

<i>*Please rate your responses from 1-5 or 8 or 9</i>	<i>DESD* 2005-2014</i>	<i>Please comment or give examples on SD initiatives</i>	<i>Present*</i>	<i>Please comment or give examples on SD initiatives</i>
SD working group with members from different departments				
Policies that promote SD for all students and staff				
Sustainable practices for students				
Student participation in SD activities				
Employees and other stakeholders act sustainability involving awareness				
SD efforts are visible throughout the campus				
Staff and researchers are aware of SD				
Staff and researchers are engaged in SD research				

2.6.2. SD implementation actions at present time

2.7. ASSESSMENT AND REPORTING

(SD assessment, SD communication, environmental reports, sustainability reports, national environmental or sustainability HEIs rankings, and international environmental or sustainability HEIs rankings)

2.7.1. SD implementation actions during UN DESD 2005-2014

Please indicate the extent to which your institution has implemented each SD action during UN DESD 2005-2014 using the following scale:

1 – Strongly disagree; 2 – disagree; 3 – Undecided; 4 – agree; 5 - Strongly agree and 8 – not applicable and 9 – I don't know/I don't want to answer.

Concerning each SD implementation action comment or give examples on SD initiatives that might had happened in your University.

<i>*Please rate your responses from 1-5 or 8 or 9</i>	<i>DESD* 2005-2014</i>	<i>Please comment or give examples on SD initiatives</i>	<i>Present*</i>	<i>Please comment or give examples on SD initiatives</i>
Assessment of SD				
Communication of SD activities				
Environmental reports				
Sustainability reports				
National environmental university's rankings				
National SD university's rankings				
International environmental university's rankings				
International SD universities' rankings				

2.7.2. SD implementation actions at present time

3. BARRIERS AND CHALLENGES

3.1. BARRIERS TO THE SD IMPLEMENTATION THAT INFLUENCE STRATEGIES IN UHEI

1 – Strongly disagree; 2 – disagree; 3 – Undecided; 4 – agree; 5 - Strongly agree and 8 – not applicable and 9 – I don't know/I don't want to answer

10.1. In your opinion which were the barriers for SD implementation in your Higher Education Institution during UN DESD 2005-2014? (You may choose more than one option)

<i>*Please rate your responses from 1-5 or 8 or 9</i>	
	Lack of management support as well as infrastructure to ensure SD
	Ignorance and misunderstandings of SD concept
	Need to recognised existing contradictions in the University concerning SD
	Rigid structures in the organigram (don't allow moving towards 'double loop' learning)
	Lack of finance resources (due to the decline in funding for higher education)
	Institutional reluctance to change (the barriers)
	Adversity to cultural change
	Low importance degree attached to sustainability
	Lack of network cooperation between universities
	Lack of network cooperation between faculties in the university or departments in the faculty
	Lack of Government policies to encourage the implementation of ESD and sustainability
	Lack of staff and any more experienced officers to implement SD
	Lack of sustainability projects uniting companies and universities
	Universities do not have or cannot justify the substantial resources required
	Unfamiliarity with Sustainability in Universities
	Decrease number of Portuguese University students in the recent years
	Other (please state below)

If *Other*, please provide examples

3.2. CHALLENGES FOR SD IMPLEMENTATION THAT INFLUENCE STRATEGIES IN YOUR UNIVERSITY

3.2.1. *In your opinion which are the challenges for SD implementation in Higher Education?*

3.2.2. *How are you going to put them into practice in your University?*

3.2.3. *Do you know that there is a National Strategy for Environmental Education (ENEA 2020)?*

<i>Yes</i>	<i>No</i>	<i>I don't know/I don't want to answer</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If *No*, please proceed to 3.2.5.

3.2.4. *What has been your University contribution considered what's written in ENEA 2020?*

3.2.5. *Do you know Global Action Program – known as GAP – for ESD from UNESCO?*

<i>Yes</i>	<i>No</i>	<i>I don't know/I don't want to answer</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.2.6. *Has your Institution ever participated in any conference about sustainability in Higher Education?*

<i>Yes</i>	<i>No</i>	<i>I don't know/I don't want to answer</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

THE END

APPENDIX C

Journal Article Appendix

(Chapter 3)

APPENDIX D

Presentations at Conferences, Seminars, Symposiums

D.1. INTERNATIONAL

D.1.1. JOURNAL CLEANER PRODUCTION, 2015, STIGES, SPAIN

2015/10/31

ABERTA CENSE Centre for Functional Ecology

“Implementation of politics and strategies in Portuguese Universities”

“Without sustainability policies, it is very difficult to encourage or motivate members of universities to participate in sustainability initiatives or HESD (Lee, K.-H. et. al., 2013).

Farinha, Carla
Caeiro, Sandra,
Azeiteiro, Ulisses

STIGES Barcelona
November, 2015

Presentation content

1. General aim;
2. Specific aims;
3. Methods
- 3.1. Top down analysis
- 3.2. Bottom up analysis
4. Results
- 4.1. Top down analysis
- 4.2. Bottom up analysis
5. Conclusions

1. General aim

Assess how the sustainability was integrated in the Universities in Portugal through its institucional strategies and politics **taking into account the GOALS OF DEDS 2005-2014.**

2. Specific aims

1. Assess the integration of sustainability in the plans, programs and politics of **Portuguese Governments;**
2. Assess the integration of sustainability in the strategies and politics of the **15 Universities.**

3. Methods

3.1. Top down analysis

- **Type of sample:** the three Constitutional Governmental Programmes (XVII, XVIII, and XIX) (accessed on 14th october 2015 and available on www.parlamento.pt);
- **selection of terms or mix:** Key words obtained by the Content Analysis of Systematic Review
- **Data base (BD):** www.parlamento.pt
- **Data treatment/analysis:** Qualitative (CA)

3. Methods

Key words

1. DEDS – Decade for Education for Sustainable Development,
2. Environmental Education,
3. Sustainable Development;
4. Science for Sustainability;
5. Environmental Management;
6. Sustainability/Sustainable,
7. Environment/Environmental,
8. Development,
9. Transdisciplinarity,
10. Holistic,
11. Integration,
12. Higher Education/Universities,
13. Curricula/Curricular Plan/Curricular Programme,
14. Campus

1

3. Methods

3.2. Bottom up analysis

- **Type of sample:** courses accredited by Agency for Assessment and Accreditation (A3ES); (accessed on 14th October 2015 and available on <http://www.a3es.pt>);
- **selection of terms or mix:** those mentioned;
- **temporal dimension:** since A3ES assessment process (>=2010)
- **Data base (BD):** A3ES
- **Data treatment/analysis:** Qualitative (CA)

7

4. Results

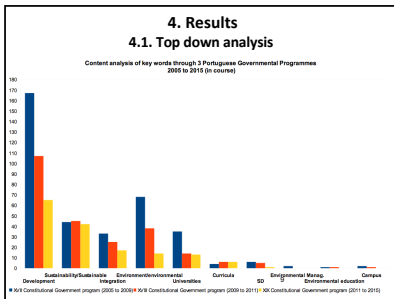
4.1. Top down analysis

As we are not aware how was the sustainability implemented in the Universities in Portugal through its strategies and politics we made a **Content analysis** of:

- the Constitutional Governmental Programmes/Great Options of Plan during DEFS period 2005-2015 (still on)

How Portugal in its Education Reform implemented Sustainability through strategies and politics DEFS 2004-2015 in Universities?

8



4. Results

4.1. Top down analysis

1. Development decreased about 2/3 in 3 different Government Programmes: Other focus?
2. Integration also decreased by a half;
3. Environment/environmental or SD have had a great decrease (79; 83%, respectively), despite PIENDS ;
4. **Sustainability or sustainable trough 3 different Government maintain the same number of references** in spite of the multiple scope of them.

10

4. Results

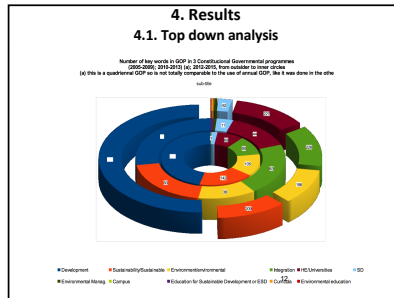
4.1. Top down analysis

2005-2009: "sustainability has entered the lexicon on the growth Agenda (...) and innovation (...) associated with serious delays in the process of qualification[...]"

2009-2011: "The commitment to sustainability (...) refers to the policy of Development of scientific and technological capabilities, and scientific institutions, universities (...);

2011-2015: "The sustainability is linked to budgetary commitments, Social Security (...), the National Health System (SNS)", and others.

11



4. Results
4.2. Bottom up analysis

How Universities in its Education Reform implemented sustainability through their plans, programmes and strategies DEDS 2004-2015 from accreditation process approach?

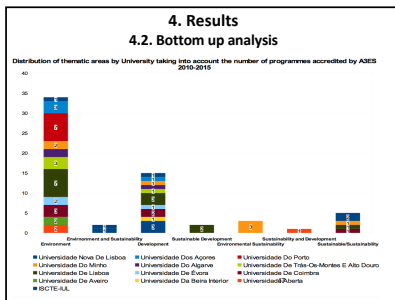
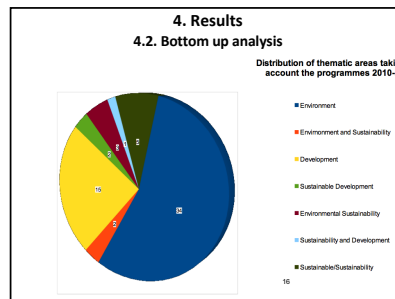
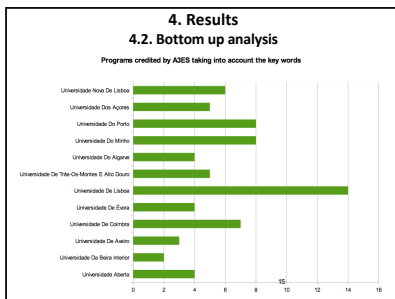
13

4. Results
4.2. Bottom up analysis

The Universities that signed the Copernicus Charter in 1994 were:

- Universidade Nova de Lisboa (UNL),
- Universidade de Lisboa (UL),
- Universidade Técnica de Lisboa (UTL),
- Universidade do Porto (UP),
- Universidade do Minho (UM),
- Universidade Católica Portuguesa (UCP).

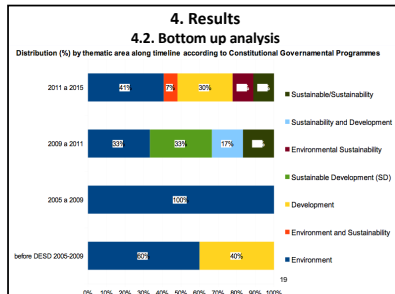
14



4. Results
4.2. Bottom up analysis

- The TOP 5 Universities that have had more programmes accredited by A3ES (2010-2015), 4 out of 5 signed CO charter (UL, UP, UM, UNL);
- More than 50% of the thematic areas were classified as "environment" and 25% as "development" and almost all Universities have programmes related to these areas;
- In what concerns to "sustainable/sustainability" only 4 out of 15 have programmes accredited (UNL, UL, UM and UC).

18



5. Conclusions

Main results

The main results are:

- "Sustainability" or "sustainable" seems to be more a recent, adopted and accepted concept as in the Governmental Prog. as in GOP which is also the case of Universities' programmes;
- Nevertheless there are still more programmes about "environment" thematic areas accredited by the Agency for Assessment and Accreditation;
- Not all the Universities that signed CO Charter are engaged with it which seems to be the case of Portuguese Catholic University.

20

5. Conclusions

Concluding remarks/Findings

We did a top down and bottom up analysis to assess how the sustainability was integrated in the Universities in Portugal through its institutional strategies and politics and the reasons were:

1. We did no find any studies concerning these matters;
2. The final year of DESD 2005-2014,
3. MDG assessment year (2015)

And until now we have accomplished many important contributions through content analysis.

21

5. Conclusions

Concluding remarks/Findings

Contributions through content analysis:

1. Suggest that Universities haven't had any top down orientation about SD as far as GPO or Constitutional Governmental Programmes concerns despite DESD;
2. Suggest that Universities had increased their programmes specially those who signed Copernicus Charter and there has been an enlargement in their offer accounting for SD/Environmental sustainability/environment and sustainability and not only for Environment.

22

5. Conclusions

Difficulties/Challenges

- Deal with the lack of documentation available online or in the libraries...

BUT there is a CONTACT...SOMEONE that knows SOMEONE...

And we didn't/don't give but this a drawback!!!

Should it be easy to achieve?

23

5. Conclusions

Next steps

1. Assess the integration of sustainability in the Plans, Programs and Politics of Ministry of Education and Science - Semi-structured interview survey with The responsables of Rectors Council of Portuguese Universities (2005 to 2014);
2. Assess the integration of sustainability in the strategies and politics of the 15 Universities - Documental research in the institutional Web Pages, Action Plans, Strategic Plans, Activity Plans and Reports of the 15 Universities as well as Sustainability Reports in particular from Universities as UP and UMG; - Questionnaire Survey endorse to the rectors and senior management of the 15 Universities

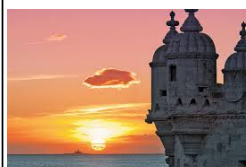
24

Special thanks to:

- Antje Disterheft – Uab's PhD colleague,
- António Capaz Coelho - General-Secretary of the Ministry of Education and Science,
- Graça Martinho – Subdiretor of the Executive Board of FCT/UNL (Scientific Board),
- Pedro Barrias – Colaborator of Rector's Council of Portuguese Universities (CRUP),
- Responsibles of the Portuguese Universities Departments of Strategic Planning or Communication

25

Thanks for your attention!!!!






Questions
are welcome!

carlasofia.farinha@gmail.com
scaeiro@uab.pt
Ulisses.Azeiteiro@uab.pt

D.1.2. ISDRS - International Sustainable Development Research Society, 2016, LISBON, PORTUGAL

2016/07/13

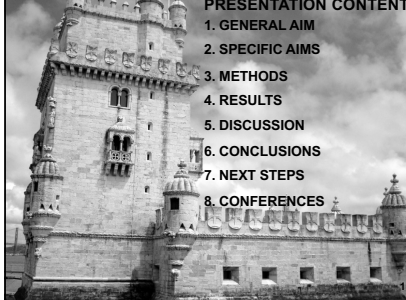




**EDUCATION FOR SUSTAINABLE DEVELOPMENT
IN HIGHER EDUCATION INSTITUTIONAL
FRAMEWORK: THE PORTUGUESE PRACTICES**

"Without sustainability policies, it is very difficult to encourage or motivate members of universities to participate in sustainability initiatives or HESD" (Lee, K.-H. et al., 2013).

FARINHA, CARLA (STUDENT)
CAEIRO, SANDRA (PROFESSOR)
AZEITEIRO, ULISSES (PROFESSOR)

ISDRS, LISBON
13th JULY 2016



PRESENTATION CONTENT

1. GENERAL AIM
2. SPECIFIC AIMS
3. METHODS
4. RESULTS
5. DISCUSSION
6. CONCLUSIONS
7. NEXT STEPS
8. CONFERENCES

1. GENERAL AIM

ASSESS HOW THE SUSTAINABILITY WAS INTEGRATED IN THE UNIVERSITIES IN PORTUGAL THROUGH ITS INSTITUCIONAL STRATEGIES AND POLICIES TAKING INTO ACCOUNT THE GOALS OF DECADE FOR EDUCATION FOR SUSTAINABLE DEVELOPMENT (DESD) 2005-2014.

2

2. SPECIFIC AIMS

ANALYSE

- 1 How and the extent to which the Portuguese Governments integrated the sustainability in their plans, programs and policies
- 2 The extent to which the Ministry of Education and Science (MES) had done so with some of the documentation produced in the period 2005-2014

ASSESS

- 3 The integration of sustainability in the strategies and policies of the **14 Universities**

3

3. METHODS
KEY WORDS | SINGLE OR MIXED TERMS

PRE-SELECTED KEY WORDS AFTER A CONTENT ANALYSIS OF SYSTEMATIC REVIEW

1. DESD (DECADE FOR EDUCATION FOR SUSTAINABLE DEVELOPMENT)
2. ENVIRONMENTAL EDUCATION
3. SUSTAINABLE DEVELOPMENT
4. SCIENCE FOR SUSTAINABILITY
5. ENVIRONMENTAL MANAGEMENT
6. SUSTAINABILITY/SUSTAINABLE
7. ENVIRONMENT/ENVIRONMENTAL
8. DEVELOPMENT
9. TRANSDISCIPLINARY
10. HOLISTIC
11. INTEGRATION
12. HIGHER EDUCATION/UNIVERSITIES
13. CURRICULA/CURRICULAR PLAN/CURRICULAR PROGRAMME
14. CAMPUS

4

3. METHODS
TOP-DOWN ANALYSIS (GOVERNMENTAL APPROACH)

TYPE OF SAMPLE/ DATA BASE

- 3 Governmental Constitutional Plans (XVII, XVIII, XIX)
- Governmental Great Planning Options (published annually)

SELECTION OF SINGLE TERMS OR MIXED

Key words obtained by the Content Analysis of Systematic Review

DATA BASE

Portuguese parliament website

DATA TREATMENT AND ANALYSIS

Qualitative (CA)

5

1

4. RESULTS
TOP DOWN ANALYSIS (MES APPROACH)

In the document "Decade of United Nations for Education for SD (2005-2014): Contributions for its dinamization in Portugal" it seemed that the civil society led a kind of a implementation movement towards ESD.

So we could not yet found any clear evidence that the integration of sustainability was led by MES through plans, programmes and policies until this point.

12

5. DISCUSSION

The results and findings of our work suggested that there hasn't been any incorporation of ESD at governmental policy and strategy level as through the Ministry of Education and Science in the Public Higher Education Institutions (HEI).

Concur: Aleixo et al. (2016) *highlighted the initial stage of SD Portuguese public HEI, based on their policies and strategies even though in Portugal 6 universities signed University Charter for SD (1994).*

13

6. CONCLUSIONS
GOVERNMENTAL APPROACH

Even though the meanings of "sustainability" or "sustainable" had varied through time, this is a far more adopted and accepted concept than before.

Suggested that Universities haven't had any top down orientation about SD as far as GCP or GGPO concerns despite DESD 2005-2014.

14

6. CONCLUSIONS
MES APPROACH

Through the documentation we had access to: "institutions", "development" and "sustainable" are in the top 10 ranking of the most frequent words.

Suggested that even Education (and here we are talking about "ED") was a major issue but the implementation of ESD was not of a matter of major importance for the Ministry.

15

6. CONCLUSIONS
LIMITATIONS ●○○

There seemed to be a lack of national integrated strategies or policies and **there haven't been any plans or programmes at least integrated to let us conclude surely that it was quite intentional because there is:**

- a) A relatively small number of sources;
- b) Doubtful quality of the documentary sources we were able to gather, despite our efforts.

These might have limited our work and so we also consider **these sources as a sample** and so they **cannot be regarded as representative**, but this can show **the lack of commitment from the governmental institutions towards ESD.**

16

7. NEXT STEPS
NEED MORE STUDIES

a) **Interviewing key-actors** can also lead to other widen or not accessible plans, policies and programs:

- From governmental society: Ministers, Secretaries of State, General Directors, PURC responsables
- From the non-governmental society

HOW?

-Semi-structured interview survey

2 ANALYSE

b) Assess the plans, policies and strategies **at HEI level** (Strategical Plans, Activities Plans and Reports, Sustainability Reports, ...) as well as implementation practices

HOW?

- Documental research

3 ASSESS

17

7. NEXT STEPS
WHAT IS THE BEST PATH TO GO?

c) **Applying a Survey** to the person responsible for Sustainability in Higher Education Institutions (HEI)

HOW?
- Questionnaire

3 ASSESS

d) **Interviewing the Rectors, and rest of the Rectoral Team, Responsibles for Pedagogical and Scientific Councils of the HEI**

HOW?
- Semi-structured interview survey

3 ASSESS

18

8. CONFERENCES/SYMPOSIUMS

My PhD work would be published in papers (#1) but so far it will be part of a chapter of a book (#1), Springer: "Education for Sustainable Development through policies and strategies in the Public Portuguese Higher Education Institutions"

International Sustainable Development Research Society Conference

14-16 September 2016: WSSD-U-2016 at the Massachusetts Institute of Technology (MIT): 3rd World Symposium on SD at Universities

19



Thanks for your attention!!!!

Questions are most welcome!

carlasofia.farinha@gmail.com
scaeiro@uab.pt
ulisses.azeiteiro@uab.pt

20

AbERTA | CENSE | Centre for Functional Ecology

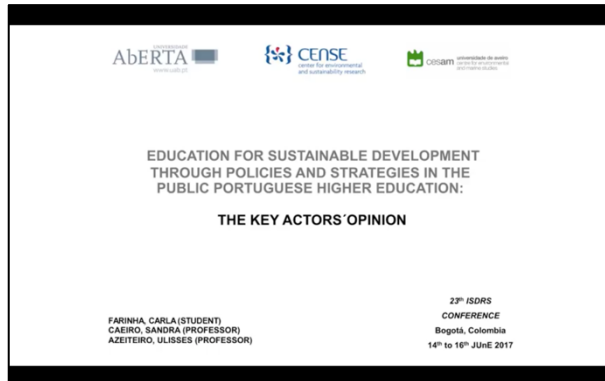
EDUCATION FOR SUSTAINABLE DEVELOPMENT IN HIGHER EDUCATION INSTITUTIONAL FRAMEWORK: THE PORTUGUESE PRACTICES

"Without sustainability policies, it is very difficult to encourage or motivate members of universities to participate in sustainability initiatives or HESD" (Lee, K-H. et. al., 2013).

FARINHA, CARLA (STUDENT) | ISDRS, LISBON
CAEIRO, SANDRA (PROFESSOR)
AZEITEIRO, ULISSES (PROFESSOR) | 13th JULY 2016

D.1.3. ISDRS - International Sustainable Development Research Society, 2017, BOGOTÁ, COLOMBIA

Video presentation available on <https://youtu.be/rjuFkP5NeTE>



D.1.4. MIT, 2017, SÃO PAULO, BRAZIL

Video presentation available on <https://youtu.be/BsJ-EmHZ7mM>



D.1.5. ISDRS - International Sustainable Development Research Society, 2018, MESSINA, ITALY

Video presentation available on <https://youtu.be/Eh3GsYUGuRU>



D.1.6. ESSSR - European School of Sustainability Science and Research, 2019, TORINO, ITALY

02/07/2019



Sustainability4U platform for Portuguese Universities: Implementation of SD challenges in Higher Education

Carla Farinha | Ulisses Azeiteiro | Sandra Caeiro
Universidade Aberta, CEFSE | Universidade de Aveiro, CESAM | Universidade Aberta, CEFSE

AGENDA

- GENERAL AIM & RESEARCH QUESTIONS
- SPECIFIC OBJECTIVES
- IMPORTANCE OF THE STUDY AND EARLIER WORK
- METHODS AND DATA COLLECTED
- RESULTS
- CONCLUSIONS

2

GENERAL AIM AND RESEARCH QUESTIONS

STUDY'S AIM Assess how sustainability was integrated in public Portuguese Universities through their institutional strategies

This research is based on **two main questions**:

RESEARCH QUESTIONS

- 1 How the sustainability was integrated in public Portuguese Universities, within the aims of Decade of Education for Sustainable Development 2005-2014?
- 2 How can they move forward so implementation can be really achieved?

3

SPECIFIC OBJECTIVES

Assess the extent (if and how) to which the Portuguese Government and the Ministry of Science, Technology and Higher Education integrated sustainability in their plans, programs and policies

ASSESS

- 1 Documentation produced in the period 2005-2014
- 2 From the key actors perspective with decision making impact

ANALYZE

- 3 The extent to which Education for Sustainable Development has been integrated in Universities through their strategic plans, sustainability reports and activity plans and reports
- 4 The different self reported Education for Sustainable Development practices of the last 15 years and propose a think tank of initiatives to be applied by Portuguese Higher Education institutions.

4

IMPORTANCE OF THE STUDY AND EARLIER WORK

THIS STUDY CONTRIBUTES TO THE LITERATURE

- Definition of a profile of Education for Sustainable Development implementation in universities, based on a European country example and how to move forward through the proposal of a Sustainability4U platform;
- Helping to understand similar patterns probably existing in other countries and what lessons can be learned

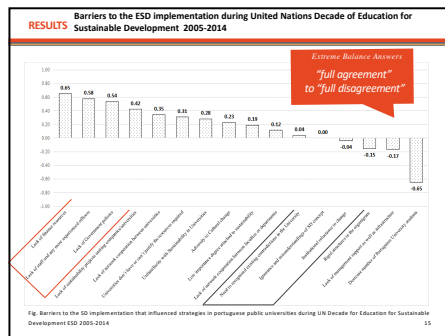
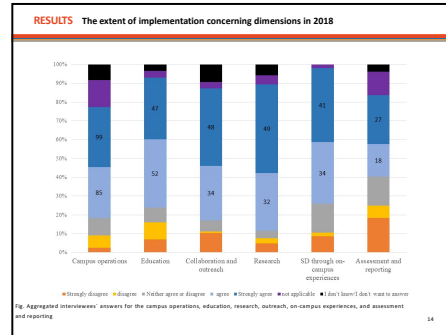
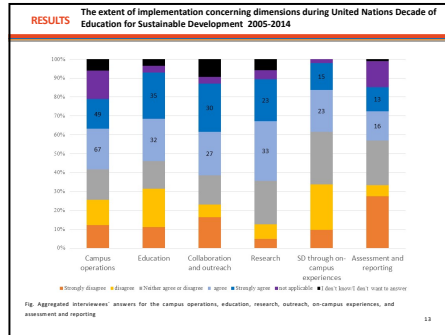
5

IMPORTANCE OF THE STUDY AND EARLIER WORK

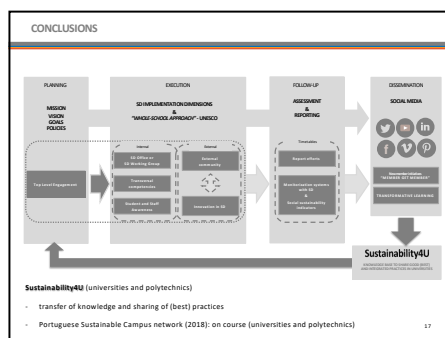
EARLIER WORK

- 1 UN Decade for Education for Sustainable Development 2005–2014 was not found to be, in itself, a common motivation for implementing university sustainability
- 2 Portuguese public universities implemented sustainability through actions whether under any Declaration, Charter, Initiative or not
- 3 Universities' actions related to Education for Sustainable Development seemed to have been taken in "isolation"
- 4 Universities' actions related to Education for Sustainable Development were not integrated according to a whole-institution approach

6



- RESULTS** Challenges to implement Sustainable Development in Universities
- 1 How to influence political stakeholders concerning governmental regulation and funding?
 - 2 How to embed Sustainable Development in institutional plans and reports?
 - 3 How to create an office cabinet dedicated to Education for Sustainable Development (if inexistent)?
 - 4 How to create Sustainable Development transversal competencies?
 - 5 How to promote student and staff sustainability awareness?
 - 6 How to assess monitoring systems of Sustainable Development indicators?



- CONCLUSIONS**
- 1 Each university seems to have its own strategy, which is seemingly in line with the insufficiency of national integrated strategies or policies related to Education for Sustainable Development, namely "lack of governmental policies"
 - 2 The main barriers that Universities face are:
 - Lack of financial resources
 - Lack of staff and more experienced officers
 - Lack of government policies
 - 3 Some of the initiatives seem to have been taken in isolation from each other and not holistically integrated

IMPORTANCE OF THE STUDY AND EARLIER WORK

EARLIER WORK

- 5** The implementation of Education for Sustainable Development at public universities provides insights about (best) practices regarding green campus procedures
- 6** This study contributed to a country profile for the implementation of sustainability in the HE sector
- 7** Collaboration and support among universities are key success factors
- 8** Portuguese University Rectors' Council can have a key role as mediator or even coordinator of this network

METHODS AND DATA COLLECTED

POPULATION

WHO? 13 relevant role actors for Sustainability implementation (mainly Vice-Rectors, but also Cabinet Directors or Working Group) at the Universities

WHERE? in public portuguese Universities

DATA COLLECTION PERIOD

WHEN? From 7th May till 18th July 2018 (12 weeks; circa 1 interview/week)

NATURE OF STUDY

HOW? Mixed research; Semi structured interviews (earlier literature review)

INTERVIEWING PREFERRED MODE

The use of an **Interview script** and (2/3) face-to-face mode; others (skype, hangout and zoom)

DATA TREATMENT AND ANALYSIS

All the interviews were **audio recorded** and transcribed.

All the responses were **treated and analyzed** (5-point Likert scale/Rosen quest):

- Descriptive statistics to almost all the questions (computed in SPSS, v.24).
- Extreme Balance Answers method (applied only to "barriers" question).
- Qualitative content analysis (open questions)

METHODS AND DATA COLLECTED

2. RECOGNIZED UNIVERSITY SYSTEM

8. Does your UHEI have ever signed any Declaration, Charter or Initiative (DCI) within SD, ESSD or sustainability sector (UN DESD 2005-2014? Eg. Copenhagen Charter and the Tallinn Declaration

Yes	No	Not Applicable?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If Yes, which Declaration, Charter or Initiative (DCI) (even if more than one, name it please, and indicate when (date)?

9. Signal any Declaration within Education for Sustainable Development?

"Yes" to "No"

10. Was Sustainable Development in vision/mission/ goals of your UHEI?

Yes	No	Not Applicable?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If Yes, please name the document(s)

METHODS AND DATA COLLECTED

2.2. CAMPUS OPERATIONS
(energy use and energy efficiency, greenhouse gases, waste, water and water management, food purchasing, transport, accessibility for disabled people, and equality and diversity)

2.2.1. SD implementation actions during UN DESD 2005-2014

Please indicate the extent to which your institution has implemented each SD action during UN DESD 2005-2014 using the following scale:

1 - Strongly disagree; 2 - disagree; 3 - Undecided; 4 - agree; 5 - Strongly agree and 8 - not applicable and 9 - I don't know/I don't want to answer.

Concerning each SD implementation action comment or give examples on SD initiatives that might had happened in your University:

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree	Not applicable	I don't know/I don't want to answer
Plans to improve energy efficiency							
Energy efficient equipment							
Renewable energy usage							
Plans to reduce CO2 emissions							
Plans to improve prevention and management waste							
Plans to improve management water							
Plans to improve management waste							
Waste free for consumption							
Waste free for recycling usage							
Plans for reuse and sustainable management							
Management of toxic materials and radioactive waste							
Reduction of toxic materials and radioactive waste							
Sustainable institutional practices							
Purchase of locally produced food products							
Promotion of organic food products							
Promotion of Fair Trade Products							
Promotion of accessible modes of transport							

"the extent to which the University has implemented Sustainability actions in 2005-2014 and in 2018?"

"Strongly agree" to "Strongly Disagree"

METHODS AND DATA COLLECTED

3. BARRIERS AND CHALLENGES

3.1. BARRIERS TO THE SD IMPLEMENTATION THAT INFLUENCE STRATEGIES IN UHEI

1 - Completely disagree; 2 - disagree; 3 - Neither agree or disagree; 4 - agree; 5 - Completely agree and 8 - not applicable and 9 - I don't know/ I don't want to answer

3.1.1. In your opinion which were the barriers for SD implementation in your Higher Education Institution during UN DESD 2005-2014? (You may choose more than one option)

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree	Not applicable	I don't know/ I don't want to answer
Lack of management support as well as responsibility to enhance SD							
Insufficient and inappropriate funding for implementation							
Need to involve existing stakeholders in the university community							
Right structures in the organization don't allow moving forward							
Lack of effective resources due to the desire to invest in higher goals							
Institutional reluctance to change (the barriers)							
Cultural change							
Low importance degree attached to sustainability							
Lack of network cooperation between universities							
Lack of network cooperation between faculties in the university							
Ability							
Lack of Government policies to encourage the implementation							
Lack of staff and/or more experienced officers to implement it							
Level of sustainability projects acting cooperation and activities							
University do not have or cannot satisfy the institutional resources required							
University with Sustainability on University							
Decision makers of Portuguese universities systems in the past years							
Other (please enter below)							

"what were the barriers?"

"full agreement" to "full disagreement"

RESULTS

- 1** There were **multiple and diversified practices** of SD implementation throughout the system
- 2** Each university had its own strategy
- 3** Nevertheless, the **(greater) extent of Education for Sustainable Development implementation in public Portuguese universities in the last 15 years** were:
 - Campus operations
 - Education
 - Collaboration and outreach

CONCLUSIONS

- 4 The challenge is **ensure that Education for Sustainable Development becomes an integral part of the university culture and thus creates a multiplier effect within the institution and in the society**, both in the short and long term
- 5 **Excellent initiatives in Sustainable Development partnerships** between Universities:
 - Publications
 - Collaboration in Sustainable Development projects
 - Funding for research
- 6 Creation of a **think tank** of initiatives
- 7 Setting up of **Sustainability4U** platform with a list of best practices and areas for sustainability improvement

19



D.2. NATIONAL

D.2.1. eSUSTAINABILITY SEMINAR, UAb, LISBON

2015

2015/06/05

Doutoramento em Sustentabilidade Social e Desenvolvimento
2º Seminário

“Aplicação da sustentabilidade nas políticas públicas e estratégias do Ensino Superior Universitário Português: Balanço de 10 anos de DEDS”

Orientadores:
Professores Doutores Sandra Caeiro e Ulisses M. M. Azeiteiro

Orientanda:
Carla Sofia Farinha

“Without sustainability policies, it is very difficult to encourage or motivate members of universities to participate in sustainability initiatives or HESD (Lee, K.-H. et. al., 2013).”

Doutoramento em Sustentabilidade Social e Desenvolvimento
2º Seminário

Porquê a escolha da problemática da aplicação da sustentabilidade nas políticas públicas e estratégias?

- **INOVADORA** em PORTUGAL no ESUP;
- **OPORTUNA NO TEMPO** dado que 2014 foi o ano final da DEDS 2005-2014;
- E, ainda, porque no ano de **2015** irão ser **avaliadas os milestones dos 8 MDG 2000**.

Doutoramento em Sustentabilidade Social e Desenvolvimento
2º Seminário



Doutoramento em Sustentabilidade Social e Desenvolvimento
2º Seminário

CONTINUAR E ACREDITAR NA INVESTIGAÇÃO: NÃO HÁ TEMPO PARA DESISTIR



Doutoramento em Sustentabilidade Social e Desenvolvimento
2º Seminário

O **tema de investigação** diz respeito à implementação da DEDS 2005-2014 no contexto do ESUP:

- 14 IES do CRUP;
- Não contempla o Ensino Politécnico;
- **Até que ponto os princípios na DEDS 2005-2014 foram aplicados** no contexto português a nível das políticas e estratégias das diversas IES

Doutoramento em Sustentabilidade Social e Desenvolvimento
2º Seminário

Objetivo Geral: Avaliar de que forma a sustentabilidade foi integrada nas Instituições de Ensino Superior Universitário (IESU) em Portugal, através das suas estratégias institucionais, no âmbito dos objetivos da DEDS 2005-2014.

O que queremos?

- Investigar e avaliar a forma de aplicação da sustentabilidade para melhor conhecer de **que forma e em que termos foi aplicada a integração da sustentabilidade nas estratégias institucionais**

1

Doutoramento em Sustentabilidade Social e Desenvolvimento
2º Seminário

Objetivos específicos (organizados por ordem cronológica):

1. Avaliar a integração da sustentabilidade nos planos, programas e políticas do MEC;
2. Avaliar a integração da sustentabilidade nas estratégias e políticas das 14 IESUP;
3. Analisar as práticas de sustentabilidade nas IES onde tenha sido identificada a aplicação de estratégias e políticas;
4. Propor a inclusão de melhorias de sustentabilidade nas estratégias e políticas das IESUP.

Doutoramento em Sustentabilidade Social e Desenvolvimento
2º Seminário

Teorias de suporte para suporte o desenho de investigação

Tipo de estudo: investigação qualitativa
Estudo de caso: avaliativo

Face ao critério "número de estudos de caso": método utilizado será estudo de casos múltiplos (casos não são selecionados por amostragem, mas de forma a prever resultados semelhantes ou produzir resultados contrastantes) porque queremos saber:

- (1) como foi aplicada a sustentabilidade nas políticas e estratégias nas 14 IES em Portugal?
- (2) Quais as práticas de sustentabilidade nas IES onde houve aplicação de estratégias e políticas para a sustentabilidade?

Doutoramento em Sustentabilidade Social e Desenvolvimento
2º Seminário

Teorias de suporte para suporte o desenho de investigação (cont.)

E ainda, a metodologia qualitativa Grounded-Theory.

.Tipo de abordagem sem qualquer preocupação de construção de hipóteses à priori.

Aplica-se à investigação em causa - abordagem dedutiva, com base no teste de uma teoria.

Fase de investigação aberta, onde a dedução é mais identificável com o que consideramos ser a investigação científica porque envolve o desenvolvimento de uma teoria.

Doutoramento em Sustentabilidade Social e Desenvolvimento
2º Seminário

Estratégias de recolha, tratamento e análise de dados
(organizando por ordem cronológica as tarefas e relacionando-as com o objetivo específico)

Tarefa 1: Avaliar a integração da sustentabilidade nos planos, programas e políticas do MEC

Tipo de amostra: exaustiva (MEC)

Estratégia de recolha de dados: Pesquisa documental / Inq. entrev. semi estruturada junto hierarq. máx. CRUP 2005 a 2014

Tratamento e análise de dados: Qualitativa (AC)/Quantitativa (SPSS)

Doutoramento em Sustentabilidade Social e Desenvolvimento
2º Seminário


Estratégias de recolha, tratamento e análise de dados
(organizando por ordem cronológica as tarefas e relacionando-as com o objetivo específico)

Tarefa 1: Avaliar a integração da sustentabilidade nos planos, programas e políticas do MEC

Onde estou? Análise de conteúdo por NVIVO 10

O quê? Artigos (1992-2015)

Onde? JCP, Int. Journal of Sustainability in Higher Education



O caso espanhol é o estudo de caso utilizado para verificarmos o que foi feito em Portugal em 10 anos.

Doutoramento em Sustentabilidade Social e Desenvolvimento
2º Seminário

Estratégias de recolha, tratamento e análise de dados
(organizando por ordem cronológica as tarefas e relacionando-as com o objetivo específico)

Tarefa 2: Avaliar a integração da sustentabilidade nas estratégias e políticas das 14 IESUP

Tipo de amostra: IESUP (14)

Estratégia de recolha de dados: Pesquisa documental (14 IES)/Relat. de Sustentabilidade (ex: UP, UM)

Doutoramento em Sustentabilidade Social e Desenvolvimento 2º Seminário	
<p>Tarefa 2: Avaliar a integração da sustentabilidade nas estratégias e políticas das 14 IESUP</p> <p>Resultará, ainda na recolha de dados por:</p> <p>Inquérito por questionário a dirigir às 14 IESUP:</p> <ul style="list-style-type: none"> - <u>Presidente do Conselho Geral,</u> - <u>Presidente do Conselho de Gestão,</u> - <u>Presidente do Conselho Pedagógico,</u> - <u>Presidente do Conselho Científico</u> <p>Tratamento e análise de dados: <u>Qualitativa (AC)/Quantitativa (SPSS).</u></p>	



Doutoramento em Sustentabilidade Social e Desenvolvimento 2º Seminário	
<p>Estratégias de recolha, tratamento e análise de dados (organizando por ordem cronológica as tarefas e relacionando-as com o objetivo específico)</p> <p>Tarefa 3: Analisar as práticas de sustentab.nas IES onde tenha sido identificada a aplicação de estratég. e políticas para a sustentabilid.</p> <p>Tipo de amostra: <u>IES onde tenha sido identificada a aplicação de estratégias e políticas</u> para a sustentabilidade</p> <p>Estratégia de recolha de dados: <u>Pesquisa documental</u> e ainda.....</p>	

Doutoramento em Sustentabilidade Social e Desenvolvimento 2º Seminário	
<p>Estratégias de recolha, tratamento e análise de dados (organizando por ordem cronológica as tarefas e relacionando-as com o objetivo específico)</p> <p>Tarefa 3: Analisar as práticas de sustentabilidade nas IES onde tenha sido identificada a aplicação de estratég. e políticas para a sustentab.</p> <p>Será realizado <u>um Inq.por entrevista</u> às hierarquias máx.14 IES para análise das práticas de sustentabilidade no sector ESUP</p> <p>Obj: Obter o número de estudos de caso múltiplo, das IES em causa, do grupo das 14 IES do CRUP</p>	

Doutoramento em Sustentabilidade Social e Desenvolvimento 2º Seminário	
<p>Estratégias de recolha, tratamento e análise de dados (organizando por ordem cronológica as tarefas e relacionando-as com o objetivo específico).</p> <p>Tarefa 4: Propor a inclusão de melhorias de sustentabilidade nas estratégias e políticas das IESUP</p> <ul style="list-style-type: none"> - "estado da arte" - Recolha de dados realizada nas fases 1, 2 e 3 <p>Proposta: Inclusão de melhorias de sustentabilidade a serem aferidas em grupos focais, workshop temáticos, conferências restritas com atores-chave do ESUP, tipo "think tank", órgãos dirigentes e técnicos do MEC, CRUP, órgãos de governos das IES</p>	

Doutoramento em Sustentabilidade Social e Desenvolvimento 2º Seminário	
<p>Estratégia de apresentação de dados:</p> <p>Publicar artigos no decorrer da investigação....permite criar ritmo e avançar com vista a objetivos compassados no tempo!!!!!!</p> <p>Previsto: Elaboração do artigo sob o tema "An overview of Sustainability strategies in the Portuguese HEI" (Theoretical Background) Submissão onde? International Journal of Sustainability in Higher Education, a elaborar de abr-set 2015</p> <p>Já submeti um abstract com os orientadores: Artigo com o tema "Education for sustainable development in policies and strategies of Public Portuguese Higher Education Institutions" Qual Workshop? "Education for Sustainable Development" na GCPC Conference 2015, Onde? Barcelona, Quando? Novembro de 2015.</p>	

Doutoramento em Sustentabilidade Social e Desenvolvimento 2º Seminário	
<p>O que espero seja o valor acrescentado da minha investigação? Qual o meu contributo para a ciência?</p> <p>Os resultados da investigação, que constituem o "nosso" desafio, poderão levar as Universidades a repensar o seu posicionamento na sociedade sustentável, no que respeita à sua estratégia, com vista ao que se esperam sejam as expectativas de todas as partes envolvidas, como estudantes, docentes, empregadores, entre outros.</p>	

	Doutoramento em Sustentabilidade Social e Desenvolvimento 2º Seminário
<p><i>I know that running can be painful and lonely. It can be a real struggle.</i></p>	
<p><i>But whenever you can, remind yourself to relax. This means every part of your body (and brain).</i></p>	
<p>Above all, take the BEST out of it!</p>	



“Education for Sustainable Development through policies and strategies in the Public Portuguese Higher Education Institutions”

*Without sustainability policies, it is very difficult to encourage or motivate members of universities to participate in sustainability initiatives or HESD (Lee, K.-H. et. al., 2013).

Farinha, Carla (Student)
Caeiro, Sandra (Professor)
Azeiteiro, Ulisses (Professor)

UAb, Lisbon
 3th and 4th June 2016

Presentation content

1. General aim
2. Specific aims
3. Methods
 - 3.1. Top down analysis
4. Results
 - 4.1. Top down analysis
5. Conclusions
6. Next steps
7. Conferences/Symposiums

1. General aim

Assess how the sustainability was integrated in the Universities in Portugal through its institutional strategies and policies **taking into account the GOALS OF DEDS 2005-2014.**

2. Specific aims

1. How and the extent to which the Portuguese Governments integrated the sustainability in their plans, programmes and policies;
2. The extent to which the Ministry of Education and Science had done so with some of the documentation produced in the period 2005-2014;
3. Assess the integration of sustainability in the strategies and policies of the **14 Universities.**

3. Methods

3.1. Top down analysis

[specific aim 1: how and the extent to which the Portuguese Government integrated the sustainability in their plans/programmes/policies]

- **Type of sample:**
 - 3 Governmental Constitutional Plans (XVII, XVIII, XIX)
 - Governmental Great Planning Options (annually)
- (accessed on 14th October 2015 and available on www.parlamento.pt)

3. Methods

3.1. Top down analysis

[specific aim 1: how and the extent to which the Portuguese Government integrated the sustainability in their plans/programmes/policies]

- **Selection of terms or mix:** Key words obtained by the Content Analysis of Systematic Review
- **Data base (BD):** parlamento
- **Data treatment/analysis:** Qualitative (CA)

3. Methods
Key words/Mix

Table 1: Pre-selected key words after a content analysis of systematic review

1. DESD - Decade for Education for Sustainable Development	8. Development
2. Environmental Education	9. Transdisciplinary
3. Sustainable Development	10. Holistic
4. Science for Sustainability	11. Integration
5. Environmental Management	12. Higher Education/Universities
6. Sustainability/Sustainable	13. Curricula/Curricular Plan/Curricular Programme
7. Environment/Environmental	14. Campus

3. Methods

3.1. Top down analysis

[specific aim 2: The extent to which the Ministry of Education and Science had done so with some of the documentation produced in the period 2005-2014]

- **Type of sample / Data base (DB):**
- Law n.62/2007, 10th September - Legal status of HEI,
- National Strategy for Development Education (2010-2015),
- Decade of United Nations for Education for SD (2005-2014): Contributions for its dinamization in Portugal,
- State of Education (2012): Autonomy and Decentralization,
- A trust agreement in higher education for the future of Portugal(2011): Investing in the future

3. Methods

3.1. Top down analysis

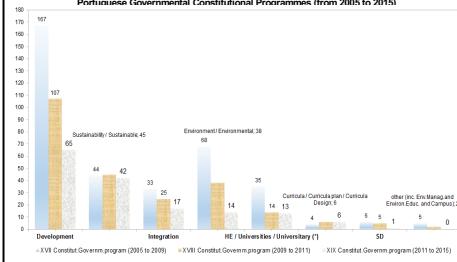
[specific aim 2: The extent to which the Ministry of Education and Science had done so with some of the documentation produced in the period 2005-2014]

- **DB:** Documents that were collected through internet, library search and personal contacts with colaborators/ employees of the Ministry of Education and Science
- **Data treatment/analysis:** Qualitative (CA)

4. Results

4.1. Top down analysis

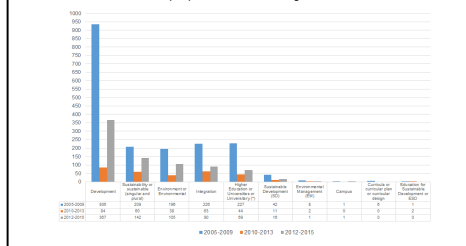
Figure 1: Number of key words (words or text) references through the Portuguese Governmental Constitutional Programmes (from 2005 to 2015)



4. Results

4.1. Top down analysis

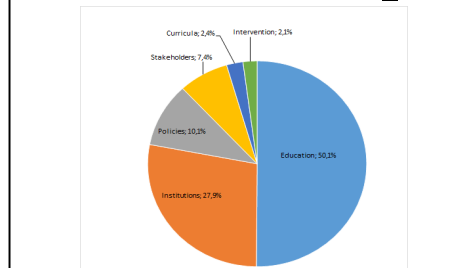
Figure 2: Number of key words (words or text) references in the Governmental Great Planning Options (GPO) from 2005 to 2014 in Portugal



4. Results

4.1. Top down analysis

Figure 3: The nodes percentual distribution for the most frequent words for MES.



4. Results

4.1. Top down analysis (Governmental approach)

Sustainability ou Sustainable: maintain the same number of References trough 3 different Governments in spite of the multiple scope of them.

2005-2009: "sustainability has entered the lexicon on the growth Agenda (...) and innovation (...) associated with serious delays in the process of qualification(...).";

2009-2011: "The commitment to sustainability (...) refers to the policy of Development of scientific and technological capabilities, and scientific institutions, universities (...);

2011-2015: "The sustainability is linked to budgetary commitments Social Security (...), the National Health System (SNS)", and others.

4. Results

4.1. Top down analysis (MES approach)

The nodes are spread as:

- "Education" had 50% of the references and included ED;
- Institutions (28%) [are related not to HEI but to secondary institutions (79%), establishments or decentralization];
- Policies (10%) [are related to public policies (44%)]

BUT when we looked up in detail it had not much to do with plans, programmes or strategies related to ESD.

4. Results

4.1. Top down analysis (MES approach)

- **National Strategy for Development Education (2010-2015)**, Decade of United Nations for Education for SD (2005-2014): Contributions for its dinamization in Portugal was led by the civil society like a kind of a implementation movement towards ESD.
- So we could not yet found any clear evidence that the integration of sustainability was led by MES through plans, programmes and policies until this point.

5. Conclusions

Main results (GOVERNMENT approach)

- Even though the meanings of "sustainability" or "sustainable" had varied through time, this is a far more adopted and accepted concept than before.
- Suggest that Universities haven't had any top down orientation about SD as far as GCP or GGPO concerns despite DESD 2005-2014

5. Conclusions

Main results (MES approach)

- When we studied the extent to which MES integrated "sustainability" in their plans, programmes and policies through the documentation, "institutions", "development" and "sustainable" are in the top 10 ranking of the most frequent words and that suggested that even Education (and here we are talking about "ED") was a major issue but the implementation of ESD was not of a matter of major importance for the Ministry.

5. Conclusions

Concluding remarks/Findings

- Suggest that Universities had increased their Programmes specially those who signed CO Charter and there has been an enlargement in their offer Accounting for **SD/Environmental sustainability/ environment and sustainability** and not only for Environment!!

[A3ES-BOTTOM UP]

5. Conclusions Concluding remarks/Findings

- To stress this: Aleixo et al. (2016) *highlighted the initial stage of SD Portuguese public HEI, based on their policies and strategies even though in Portugal 6 universities signed University Charter for SD (1994).*



5. Conclusions Difficulties/Challenges

- There is a lack of national integrated strategies or policies and *there haven't been any plans or programmes at least integrated to let us conclude surely that it was quite intentional because there is:*

- A relatively small number of sources;
- The quality of the documentary sources we were able to gather, despite our efforts

These might have limited our work and so we also consider *these sources as a sample and so they cannot be regarded as representative, but this can show the lack of commitment from the governmental institutions towards ESD.*

6. Next steps

Need more detailed STUDIES>>>>>

- Interviewing key-actors concerning the implementation of sustainability in HEI through DESD 2005-2014 can also lead to other wider or not accessible plans, policies and programs:
 - From governmental society: Ministers, Secretaries of State, General Directors, PURC responsables
 - (also) from the non-governmental society;

HOW: [Semi-structured interview survey](#)

6. Next steps

- Analyzing the plans, policies and strategies at HEI level (PE, PA, RA, RS,..) as implementation practices
HOW: [Documental research](#)
- Applying a Survey to the person responsible for sustainability in HEI
HOW: [Questionaire](#)
- Interviewing the Rectors, and rest of the Rectoral Team, Responsible for Pedagogical and Scientific Councils of the HEI
HOW: [Semi-structured interview survey](#)

7. Conferences/Symposium

Special thanks to:

- Antje Disterheft – Uab's PhD colleague,
- António Capaz Coelho - General-Secretary of the Ministry of Education and Science,
- Graça Martinho – Subdiretor of the Executive Board of FCT/UNL (Scientific Board),
- Madalena Carvalho – Responsible for Documentation Center in UAB
- Pedro Barrias – Colaborator of Rector's Council of Portuguese Universities (CRUP),
- Responsibles for the Portuguese Universities Departments of Strategic Planning or Communication...

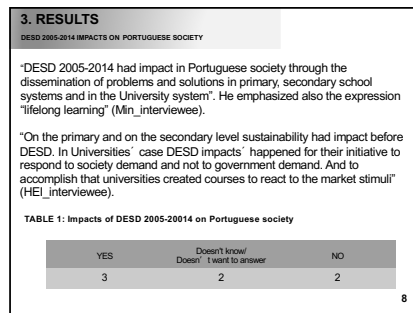
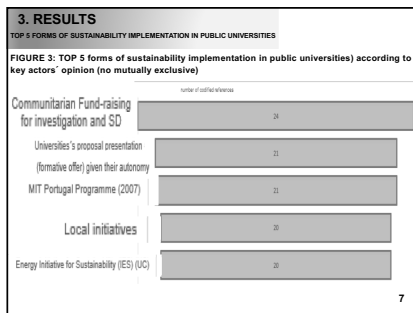
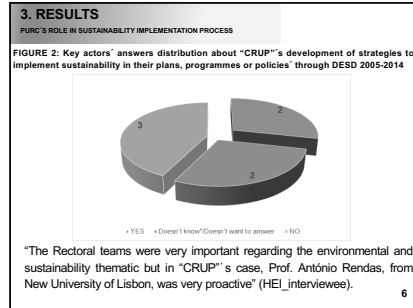
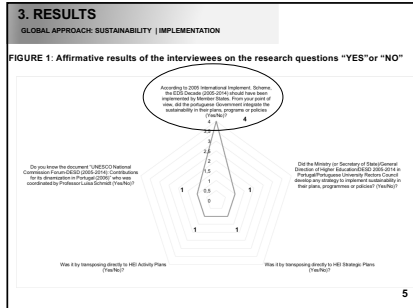
Sandra Caeiro e Ulisses Azeiteiro "por ainda estarem por ai"!

Thanks for your attention!!!!



Questions
are welcome!

carlasofia.farinha@gmail.com
scaeiro@uab.pt
Ulisses.Azeiteiro@uab.pt



4. CONCLUSIONS

1. Even though the meanings of "sustainability" or "sustainable" had varied through time (when analysing in early research the Governmental and Ministerial documents), this is a far more adopted and accepted concept than before, what suggested that Universities haven't had ANY TOP DOWN orientation about Sustainable Development as far programmes, plans or strategies concerns despite DESD 2005-2014. This is in line with key actors' opinion.

2. Education was a major issue for the Ministry (when analyzing the top 10 ranking of words or text we found "institutions", "development" and "sustainable") but the implementation of Education for Sustainable Development was not a matter of major importance for the Ministry.

9

4. CONCLUSIONS

3. The TOP 5 forms of sustainability implementation in public Universities referred by the key actors were:

- Communitarian Fund-raising for investigation,
- Universities' proposal for formative offer,
- MIT Portugal Programme (2007),
- Local initiatives,
- Energy Initiative for Sustainability (IES) (Coimbra University)

4. Concerning DESD 2005-2014 impact in Portuguese society, those were mainly through the dissemination of problems and solutions of "lifelong learning", mostly in primary and secondary school.

As (final) conclusion there seemed to be a lack of commitment from the Governmental and Ministerial institutions towards ESD. Nevertheless before UN DESD 2005-2014 many initiatives took place concerning environmental education.

10

4. CONCLUSIONS ●○○

LIMITATIONS

- ❖ There seemed to be only few documents partly linked to sustainable development and **there haven't been any plans or programmes at least integrated to let us conclude surely that it was quite intentional because:**
- Doubtful quality of the documentary sources (as well as the scarce number) we were able to gather before the interviewing survey, despite our efforts, even though key actors' uncovered published and unpublished legislation, we haven't had access to before;
- We interviewed key actors and had their opinion;
- ❖ We consider the **documentary** sources as a sample what might show the **lack of commitment from the governmental institutions towards Education for Sustainable Development** so as the **these interviewees. The samples** (documentary sources as key actors interviewed) **cannot be regarded as representative.**

11

5. NEXT STEPS ○○○

NEED MORE STUDIES

b) Assess the plans, policies and strategies at **public University level** (Strategical Plans, Activities Plans and Reports, Sustainability Reports, ...) as well as implementation practices

HOW?

2 **ASSESS**

- Documental research

c) **Applying a Survey** to the person responsible for Sustainability in Higher Education Institutions to propose strategies and policies for sustainability improvements

HOW?

3 **PROPOSAL**


- Questionnaire survey

12

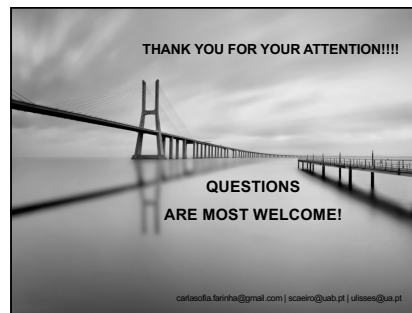
6. CONFERENCES/SYMPIOSIUMS

My PhD work was already published as an article in the book (#1) Springer: "Education for Sustainable Development through policies and strategies in the Public Portuguese Higher Education Institutions".

And the following presentations will be:



13



2019

Abstract presented to e-Sustainability, 28/06/2019. It will be published in e-book.

Título: A plataforma Sustainability4U para as Universidades Portuguesas: Implementação dos desafios do Desenvolvimento Sustentável

Carla Sofia Farinha
Departamento de Ciências e Tecnologia Universidade Aberta, Lisboa, Portugal
CENSE - Center for Sustainability and Environmental Research, NOVA University of Lisboa,
Portugal E-mail: carlasofia.farinha@gmail.com

Ulisses Azeiteiro
Departamento de Biologia e CESAM - Centre for Environmental Marine Studies, Universidade
de Aveiro, Aveiro, Portugal
E-mail: ulisses@ua.pt

Sandra Sofia Caeiro
Departamento de Ciências e Tecnologia Universidade Aberta, Lisboa, Portugal
CENSE - Center for Sustainability and Environmental Research, NOVA University of Lisboa,
Portugal E-mail: scaeiro@uab.pt

Palavras-Chave: EDS - Educação de Desenvolvimento Sustentável, Instituições de Ensino Superior, Abordagem holística, Portugal, Universidades

Resumo:

A UNESCO teve como uma das suas preocupações, desde a sua criação em 1945, colocar a qualidade da educação no coração do desenvolvimento, o que vai de encontro à sua missão, numa visão holística da educação como meio para a paz, erradicação da pobreza, e impulso do desenvolvimento e diálogo intercultural. A educação é um pré-requisito para promover alterações comportamentais e fornecer as competências para o DS (Desenvolvimento Sustentável) porque permite a igualdade de oportunidades entre classes, géneros, raças e “credos”, ainda que o conceito de EDS (Educação para o Desenvolvimento Sustentável), que nasceu após a Conferência de Joanesburgo em 2002, tenha de ser enquadrado a nível local e temporal. A recomendação da adoção da Década das Nações Unidas da Educação para o Desenvolvimento Sustentável (UN DEEDS) 2005-2014, aplica-se ao período em causa, e o objetivo era integrar os princípios, os valores e as práticas do DS a todos os aspetos da educação e da aprendizagem. Uma boa parte destas responsabilidades recai sobre as Instituições de Ensino Superior (IES), que têm uma responsabilidade moral para aumentar a consciência, o conhecimento, as competências e os valores necessários para um futuro sustentável e justo. O papel que as Universidades podem desempenhar na educação integrada para o EDS é um dos grandes desafios na transição para um futuro mais sustentável. Para tal, espera-se das IES que, na sequência do que têm vindo a fazer, continuem a assumir um papel central na mudança de paradigma no sentido de permitir às gerações atuais e futuras que vivam de modo mais saudável e em harmonia e respeito com a Terra, que tem recursos finitos e limites biofísicos, cada vez mais evidentes e incontornáveis. As IES são tão mais importantes dados os seus três pilares: Ensino, investigação e inovação, o designado triângulo do conhecimento. Muitas Declarações e Compromissos foram assinados pelas IES. A assinatura e comprometimento dos líderes das IES, tornando-as verdadeiros catalisadores do DS, foi considerado um “sinal” promotor da sustentabilidade, verificável através de diversas Declarações pré-DEEDS 2005-2014. A Declaração de Talloires (AUSFL, 1990) foi o primeiro ato oficial de Compromisso do Ensino Superior com DS para que estas se assumissem como agentes de mudança na incorporação e disseminação da sustentabilidade. Em 1994, a Declaração Copernicus (CRE, 1994), assinada por 196 universidades, foi entendida como o compromisso da gestão de topo das IES com o DS com vista a preservar o ambiente e a

promoção do DS. É importante conhecer-se o perfil e nível de comprometimento das Universidades em todo o mundo em particular na Europa, continente onde se encontram as mais antigas universidades, e o seu papel como líder nas estratégias e políticas de implementação da sustentabilidade no Ensino Superior. Nos países da Europa Central e Ocidental, como a Suécia e o País de Gales (Lotz-Sisitka, 2004; Glover & Peters, 2013) estão a ser implementadas boas práticas, de acordo com um movimento “top-down”. Nos países do sul da Europa como Portugal, estudos anteriores permitiram conhecer iniciativas e boas práticas das universidades portuguesas (Farinha et al., 2017; 2018; 2019) resultantes da sua autonomia e responsabilidade social, o que permitiu desenvolver diversas políticas com vista à EDS num movimento “bottom-up”. No entanto, é importante para conhecer o perfil do país conhecer se os objetivos traçados nas estratégias, planos, relatórios e práticas das IES foram atingidos (Leal Filho et al., 2018).

O objetivo geral deste estudo foi avaliar de que forma a sustentabilidade foi integrada nas Instituições de Ensino Superior Universitário (IESU) público em Portugal, através das suas estratégias institucionais, no âmbito dos objetivos da UN DEDS 2005-2014 e tem 4 objetivos específicos organizados por ordem cronológica de forma a responder ao objetivo geral. O objetivo específico desta investigação é propor um plataforma de inclusão de melhorias de sustentabilidade (“think tank” de iniciativas) nas estratégias e políticas das IESUP, com vista a aumentar, transferir o conhecimento e partilhar as (melhores) práticas integradas entre as universidades portuguesas.

Para tal foram realizadas entrevistas semiestruturadas aos responsáveis pela integração da sustentabilidade em cada uma das IES com vista a listar as diferentes ações implementadas e como se ultrapassaram as barreiras, quer durante a UN DEDS 2005-2014 quer na atualidade (2018), e quais os desafios que se anteveem para as Universidades. Foram, igualmente, discutidas iniciativas e boas práticas por parte de quase todas as IES, somando treze num total de catorze universidades contactadas.

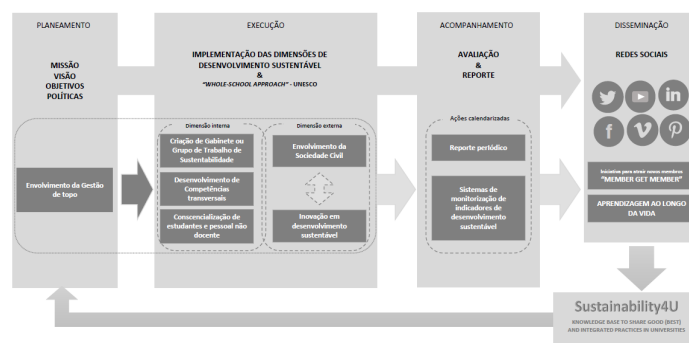
Os resultados confirmam que ao longo da DEDS 2005-2014, houve quase inexistência ou, pelo menos, insuficiência quer de orientações estratégicas quer de políticas nacionais respeitantes à implementação da EDS no Ensino Superior emanadas quer do Governo quer do Ministério da Ciência, Tecnologia e Ensino Superior. Estes resultados decorrem quer da análise de documentos quer das entrevistas a atores chave (Farinha (2017, 2018)), ainda que o Programa Massachusetts Institute of Technology (MIT) Portugal tenha sido um bom exemplo de comprometimento político e estratégico e de aplicação de sustentabilidade no Ensino Superior com a criação de Mestrados (MSc) e Doutoramentos (PhD), maioritariamente na área da energia. Por sua vez, o programa de Eficiência Energética na Administração Pública (Eco.AP) é um outro bom exemplo do envolvimento ministerial cujo papel é avaliar e implementar medidas para melhorar e reduzir o consumo energético nas universidades. Os resultados encontrados sugerem que a UN DESD 2005-2014 não foi considerada em si mesma uma motivação para a incorporação da sustentabilidade nas IES tal como a assinatura de declarações formais não foram condição necessária e suficiente para tal (Farinha, 2019). As Universidades, por sua iniciativa, protagonizaram o seu próprio movimento de implementação, tendo sido possível recolher bons exemplos e iniciativas. As universidades não tendo tido, globalmente, uma orientação “top-down” em termos de DS nos últimos quinze anos (desde 2004 a 2018), as dimensões (Lozano et al., 2015) que foram consideradas de maior relevância na integração da sustentabilidade foram: (a) “operações no campus”, (b) “educação”, (c) “alcance e colaboração”, (d) “investigação” e (e) “DS através de experiências no campus”. E as iniciativas das Universidades relacionadas com a EDS foram realizadas de forma “isolada” e não de forma integrada de acordo com a “whole institution approach” da UNESCO, com exceção de parcerias no DS, nos projetos de investigação, publicações, colaboração em projetos de desenvolvimento sustentado (DS) e financiamento para a investigação. Foi, ainda, possível conhecer as (melhores) práticas nas universidades públicas, apesar de existirem áreas

chave onde as IES encontram(ra)m barreiras como a falta de recursos financeiros e humanos e ausência de enquadramento de políticas governamentais. Estes são alguns dos desafios para os quais são necessárias estratégias para a implementação do DS nos planos institucionais (com envolvimento da gestão de topo), criação de um gabinete dedicado à EDS nas universidades e/ou faculdades, onde tal estrutura não exista, a criação de competências transversais em DS para todos os estudantes, através de disciplinas e/ou cursos para promover a transdisciplinaridade e consciencialização sobre estas matérias. O propósito é que o DS seja parte integrante da cultura da universidade e crie um fator multiplicador na instituição e na sociedade não só a longo prazo, como também no futuro próximo. Este processo corresponde às fases de planeamento, execução e acompanhamento (monitorização e uso de indicadores) (vide figura 1), sendo que a comunicação e disseminação das ações é absolutamente necessária para a sua visibilidade.

Através deste estudo foi possível chegar a uma definição de perfil do país para a implementação da sustentabilidade no sector da Educação Superior, em particular nas universidades públicas, sendo proposta uma plataforma de diálogo e partilha - Sustainability4U - com vista a potenciar a aprendizagem do tema no seio da comunidade das IES. Esta plataforma é uma proposta de iniciativas para aumentar, transferir o conhecimento e partilhar as (melhores) práticas integradas entre as IES portuguesas, sejam universidades e/ou politécnicos (figura 1). Como Portugal é um país pequeno onde é fácil estabelecer comunicação entre universidades e trocar experiências de aprendizagem foi criada, em 2018, a “Rede Campus Sustentável” entre os membros da comunidade das IES (universidades e politécnicos) não só para partilhar conhecimento e experiências, mas igualmente para convencer a gestão de topo das IES a assinar uma carta de compromisso baseada na Declaração de Copernicus e na Estratégia Nacional para a Educação Ambiental (ENEA). Esta Iniciativa mostra não só um compromisso da comunidade académica portuguesa como é um bom exemplo de uma abordagem “bottom-up”. O compromisso para a implementação de políticas públicas nas universidades é crítico para que o processo seja efetivo no que respeita à EDS inclusivo. Consequentemente, há uma necessidade premente de alterar o paradigma nas universidades portuguesas e ainda debelar alguns obstáculos.

Pretende-se, em desenvolvimentos futuros, pôr em prática a plataforma Sustainability4U, não só entre as IES portuguesas, mas igualmente a nível europeu e internacional, baseado no estudo de caso do país do sul da Europa. Regiões ou perfis semelhantes podem aprender com esta experiência e evitar os mesmos erros e barreiras. O conhecimento do perfil detalhado das Universidades pode ser ainda alargado a todas as IES em Portugal.

Figure 1: A plataforma de Sustainability4U (adaptado)



References

- AULSF. (1990). Talloires Declaration Signatories List. (A. o. Future, Ed.) Obtido em 3th de September de 2017, de <http://ulsf.org/96-2/#Portugal>
- CRE. (1994). The University Charter for Sustainable Development [Carta Copernicus]. Retrieved September 3th, 2017, from <https://www.iau-hesd.net/sites/default/files/documents/copernicus.pdf>
- Farinha, C., Azeiteiro, U., & Caeiro, S. (2018). Education for Sustainable Development in Portuguese Universities Institutional Framework: The key actors' opinion. *International Journal of Sustainability in Higher Education*. doi:10.1108/IJSHE-09-2017-0168
- Farinha, C., Azeiteiro, U.M. and Caeiro, S. (2017). Education for sustainable development through policies an strategies in the public Portuguese higher education institutions. In W. Leal Filho (Ed.), *Handbook of Theory and Practice of Sustainable Development in Higher Education* (pp. 275-290). Berlin: Leal Filho, W.,Ulisses, U.M.; Alves, F. and Molthan-Hill, P. (Eds). doi:10.1007/978-3-319-47877-7_20
- Farinha, C.; Azeiteiro, U.; Caeiro, S. (2019). Sustainability Strategies in Portuguese Higher Education Institutions: Commitments and Practices. *Sustainability*, 11(11), 1-25.
- Glover, A. & Peters, C. (2013). A whole Sector Approach: Education for Sustainable Development and Global Citizenship in Wales. In S. & Caeiro, *Sustainability Assessment Tools in Higher Education Institutions: Mapping Trends ans Good Practices Around the World* (p. 217). Switzerland: Springer International Publishing Switzerland.
- Leal Filho, W.; Azeiteiro, U.; Alves, F.; Pace, P.; Mifsud, M.; Brandli, L.; Caeiro, S.; Disterheft, A. (2018). Reinvigorating the sustainable development research agenda: the role of the sustainable development goals (SDG). *International Journal of Sustainable Development & World Ecology*, 25(2), 131-142. doi:10.1080/13504509.2017.1342103
- Lotz-Sisitka, H. (2006). H. Stories of transformation. *Journal of Sustainable Higher Education*(1), 8-10.
- Lozano, R.; Ceulemans, K.; Alonso-Almeida, M.; Huisingh, D.; Lozano, F.; Waas, T.; Lambrechts, W.; Lukman, R.; Hugé, J. (2015). A review of commitment and implementation of sustainable development in higher education: results from worldwide survey. *Journal of Cleaner Production*, 108, 1-18.
- UNESCO. (2005). *United Nations Decade of Education for Sustainable Development (2005-2014): International Implementation Scheme*. From <http://unesdoc.unesco.org/images/0014/001486/148654E.pdf>
- UNESCO. (2012). *Education for sustainable development: sourcebook*. Paris: UNESCO. Retrieved April 20, 2019, from <https://unesdoc.unesco.org/ark:/48223/pf0000216383>