



Assessing the Provisions for Sustainability in Economics Degree Programmes

Journal:	<i>International Journal of Sustainability in Higher Education</i>
Manuscript ID	IJSHE-08-2023-0382.R3
Manuscript Type:	Research Paper
Keywords:	sustainability, provisions, Economics Degree Programs, Higher Education Institutions (HEIs), sustainable development (SD), case studies

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Assessing the Provisions for Sustainability in Economics Degree Programmes

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Submitted: 28 August 2023, last revised: 18 October 2023, accepted: 21 November 2023

Abstract

Purpose

Higher Education Institutions (HEIs) offer courses and programmes focusing on sustainability in economics, as courses on sustainable development (SD), which examine the economic,

1
2
3 social and environmental dimensions of SD. This article examines sustainability integration in
4 economics degree programmes.

5 **Design/methodology/approach**

6 Through an extensive literature review in Web of Science (WoS) and information search in
7 Google, conducting to 28 relevant case studies, the article elucidates the emphasis given to
8 sustainability as part of economics degree programmes in HEIs.

9 **Findings**

10 The results suggest that, whereas the inclusion of sustainability components in this field is a
11 growing trend, much still needs to be done in order to ensure that matters related to SD are
12 part of the routine of university students studying economics.

13 **Originality**

14 The novelty of this study lies in addressing sustainability with the specific economics focus
15 programmes within the HEIs context.

16 **Research limitations/implications**

17 It is worth noting that the literature review conducted in WoS was primarily aimed at assisting
18 in the selection of university case studies. The 28 university case studies scrutinised in this
19 study may lack sufficient representation from numerous developing countries.

20 **Practical implications**

21 This study highlights challenges in integrating the SD into economics degree programmes,
22 suggesting the need for curriculum adjustments as underscoring operational issues, acting as
23 barriers. The inclusion of sustainability in economics programmes must navigate operational
24 issues stemming from packed timetables and busy schedules, requiring innovative solutions.

25 **Social implications**

26 As far as the authors are aware, this study holds substantial importance in its emphasis on
27 implementing sustainability within HEIs' economics programmes, assisting in pursuing SD.

28
29 **Keywords:** sustainability; provisions; Economics Degree Programmes; Higher Education
30 Institutions (HEIs); sustainable development (SD); case studies
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1. Introduction

The United Nations (UN) 2030 Agenda sets 17 Sustainable Development Goals (SDGs) to shift the economy towards sustainability (United Nations, 2015a). Higher Education Institutions (HEIs) are bound to have a prominent role (Walter Leal Filho et al., 2019). Sustainable Development Solutions Network, SDSN (2015), backs universities, enabling unique SDGs implementation and Education for Sustainable Development (ESD) (Shiel, Smith, & Cantarello, 2020). Education is a distinct goal (SDG4), connecting to nearly all goals in various ways (Walter Leal Filho et al., 2019). SDSN emphasizes that no SDG is likely achieved without university involvement (SDSN, 2017, p. 3), acknowledged in studies (Walter Leal Filho, Ismaila Rimi Abubakar, et al., 2023; Walter Leal Filho, Luciana Londero Brandli, et al., 2023; Walter Leal Filho, Thais Dibbern, et al., 2023; Walter Leal Filho, Dinis, et al., 2022; Walter Leal Filho, Frankenberger, et al., 2021; Walter Leal Filho, Salvia, et al., 2022; Walter Leal Filho, Laís Viera Trevisan, et al., 2023; Walter Leal Filho, Vasconcelos, Dinis, & Trevisan, 2022; Walter Leal Filho, Vidal, et al., 2022; Walter Leal Filho, Wall, et al., 2022).

SDGs' university involvement is explored in literature (Fauzi, Abdul Rahman, & Lee, 2022). Universities primarily address SDGs through research and education (Alcántara-Rubio, Valderrama-Hernández, Solís-Espallargas, & Ruiz-Morales, 2022), emphasizing social goals, rather than economic and ecological ones (Vogel & Breßler, 2022). SDGs need to be integrated in universities through curriculum integration, training actions, and strategic mission focus (Serafini, Moura, Almeida, & Rezende, 2022).

Recent studies explore how HEIs contribute to society (Walter Leal Filho, Salvia, & Eustachio, 2023), with sustainability research focusing on education, sustainable cities, and climate change (CC) (Salvia, Leal Filho, Brandli, & Griebeler, 2019). Universities can align with SDGs, emphasizing renewable energy and carbon emission reduction in campus operations (Gui, Gou, & Lu, 2021; Walter Leal Filho, Aina, Dinis, Purcell, & Nagy, 2023; Walter Leal Filho, Sima, et al., 2021; Walter Leal Filho, Diogo Guedes Vidal, et al., 2023; Logan, Nelson, Osbeck, Chapman, & Hastings, 2020). SDGs can also be integrated into civic engagement and community outreach (Walter Leal Filho, Kovaleva, et al., 2022; Walter Leal Filho, Salvia, et al., 2022; Walter Leal Filho et al., 2019). SDGs can be integrated institution-wide or in specific courses/disciplines at macro and micro levels, respectively (Fia, Ghasemzadeh, & Paletta, 2022).

Macro level efforts include integrating sustainability training in the Spanish University System (Albareda-Tiana, Ruiz-Morales, Azcárate, Valderrama-Hernández, & Muñoz, 2020) or inter-university collaborations in Africa (Nyerere et al., 2021). Most publications focus on designing courses and transforming curricula to address the SDGs (Fekih Zguir, Dubis, & Koç, 2021; Weiss, Barth, & von Wehrden, 2021). Most focus on SDG4 via ESD, aiming to foster a sustainable culture (Fia et al., 2022). Many institutions lack emphasis on SDGs and provide limited training for university staff (Walter Leal Filho, Ana Simaens, et al., 2023). Authors propose frameworks and tools for systematically integrating SDGs into university programs (Albert & Uhlig, 2021; Ferrer-Estévez & Chalmeta, 2021; Kioupi & Voulvoulis, 2020; Walter Leal Filho, Frankenberger, et al., 2021).

Incorporating sustainable development (SD) in university education fosters student learning and skills for their degrees. Studies in engineering explore the integration of SDGs into study programmes (Álvarez et al., 2021; Beagon et al., 2022; Sigahi & Sznelwar, 2023; Zanitt et al., 2022). Disciplines are integrating crucial sustainability skills into their curricula using innovative methods and technologies (Baena-Morales, García-Taibo, Merma-Molina, & Ferriz-Valero, 2022; Hübscher, Hensel-Börner, & Henseler, 2022; Kanapathy, Lee, Mokhtar, Syed Zakaria, & Sivapalan, 2021; Stough, Ceulemans, & Cappuyns, 2021). Examples include work-integrated learning, real-life university experiences to enhance sustainability competencies (Alm, Beery, Eiblmeier, & Fahmy, 2022), and student-led initiatives for SDGs-related activities to boost engagement (Lee, Liu, Warnock, Kim, & Skett, 2023). Active methodologies are reported as effective tools for sustainability training (Carrió Llach & Llerena Bastida, 2023; Martínez Valdivia, Pegalajar Palomino, & Burgos-Garcia, 2023).

Research on integrating sustainability into business education recognises the significance of corporate social responsibility and socially responsible investment (Greer &

Economics now includes environmental considerations, giving rise to fields like ecological and environmental economics (Figure 1), supporting Polasky et al. (2019) assertion that economics should centrally contribute to addressing the SD challenge.

Integrating sustainability into economics education offers benefits beyond the sustainable transition (UNESCO, 2017). ESD is essential in all university degrees, with programme adaptation fostering pro-environmental changes. Economics degrees involvement is crucial for sustainability (Figure 2), with economists leading in policy-making for SD strategies. Arrows in Figure 2 indicate pro-environmental influences spreading to markets, society, and the biosphere, highlighting SD learning dynamics (UNESCO, 2018).

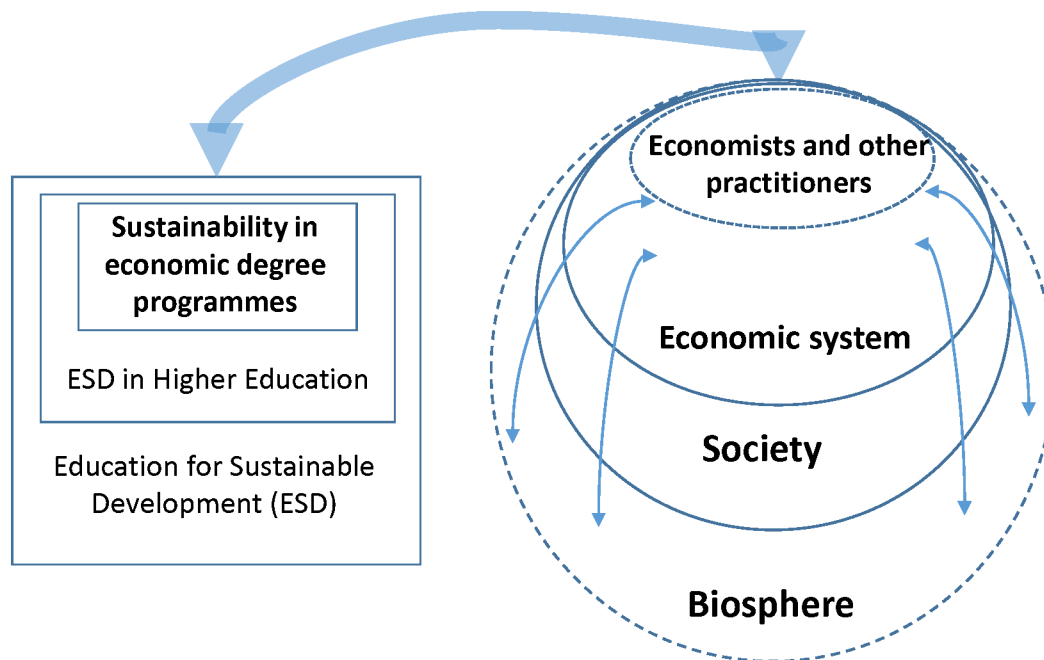


Figure 2. Potential impact of introducing sustainability in economic education programmes on sustainable development.

To address the sustainability crisis and meet international commitments (UNESCO, 2005a, 2005b, 2017; United Nations, n.d.-b). Accordingly, this study focuses on economics programmes acknowledging significant overlaps with business programmes. Economics programmes offer a broader theoretical perspective, justifying the distinct focus.

Changing how sustainability is taught is crucial, with transformative learning (Davelaar, 2021; Mezirow, 1997; Sterling, 2011) going beyond theoretical aspects, impacting worldviews and values (Sterling, 2011). Considering sustainability's depth and complexity, it is vital to examine its integration into economics programmes.

3. Materials and Methods

This study is motivated by worldwide efforts in HEIs for SD, aligned with various SDGs, particularly SDG4, SDG13, SDG16 and SDG17 (International Association of Universities (IAU), 2023; United Nations, n.d.-a, n.d.-c). The study focuses on SDG4, particularly target 4.7. Specifically, indicator 4.7.1 assesses the integration of global citizenship education (GCED) and ESD in national policies, curricula, teacher education, and student assessment (United Nations, n.d.-b). Aligned with global SD efforts and inspired by various SDGs, this research addresses the knowledge gap on sustainability integration in HEIs within economics.

In the initial literature review phase, a thorough bibliometric analysis was conducted on the Web of Science (WoS) database, using a search string to identify peer-reviewed publications on sustainability, economics, education/training, and universities. Boolean operators like AND and OR were employed for a focused search. The search string aimed to

gather comprehensive information, as a more restrictive search yielded limited results: TS=((“sustainability” or “SDG” or “SDGs”) and (“economics”) and (“education” or “training” or “curricula” or “curriculum”) AND (“universit*” OR “higher education institut*”)).

Figure 3 displays publications categorized by WoS classification, stemming from the initial literature search for case studies. Only categories with over 5 articles were considered. Larger rectangles indicate a higher proportion of publications in the WoS category, with the number inside representing the total publications by discipline. The "Education Educational Research" category encompasses 71 publications, and the "Economics" category has 15. All publications in these categories were thoroughly examined. For others, titles and abstracts were reviewed, and if relevant to the research focus, full analysis was conducted. The search on March 18, 2023, yielded 156 articles, mentioning universities later analysed.



Figure 3. Tree map chart of publications grouped by WoS (2023) categories, with more than 5 publications in each category

The second method involved using Google to find universities offering sustainability in economics degrees. Google, the globally top-ranked search engine according to Alexa (2023), was selected for its popularity. This rank justifies Google's use as a reliable search engine. A search on March 20, 2023, using terms like "sustainability," "economic," and "degree" yielded 132 million results. Google's algorithm prioritizes relevant and authoritative search results. This implies top-notch results usually show on the first search page (Brake, 2017). Analysing the first 6 pages (60 universities), the search was halted as results deviated from the research objective. While WoS provides excellent results, Google's accessibility and broader coverage make it ideal for extensive searches. Combining both systems is recommended for comprehensive coverage (Brophy & Bawden, 2005).

A total of 28 relevant university case studies were gathered from literature (WoS) and university websites (Google) to illustrate the inclusion of sustainability in HEIs' economics education programmes. The case study approach provides in-depth insights and strengthens analytical findings (Yin, 2018), efficiently gathering extensive data from various sources, generating fresh, contextualized insight (Eisenhardt & Graebner, 2007; Miles, Huberman, & Saldana, 2019; Yin, 2018). Recommended by authors such as Adams et al. (2016) and Brophy and Bawden (2005), the case studies were chosen through searches in WoS and Google. Firstly, peer-reviewed publications in the WoS database were searched for sustainability in economic degrees. Subsequently, Google was used to identify universities offering economic degrees with a sustainability focus. In the second phase, data from 28 case studies were tabulated, including details such as university, country, programme, scope, and source. In the next step, economics degrees for cases 1 to 16 (WoS) and cases 17 to 28 (Google) were scrutinized, resulting in a database of 285 potential degree programmes (112 undergraduate,

173 graduate). Focused on economics to address a literature gap, business, finance, marketing, and other degrees were excluded, leaving 64 degrees for analysis (34 undergraduate, 30 graduate). Sustainability information was sought on the 64 main websites and programme details, utilizing titles, descriptions, and content. Missing data were requested via email to complete the analysis database for each degree.

Figure 4 summarizes the research methodology steps.

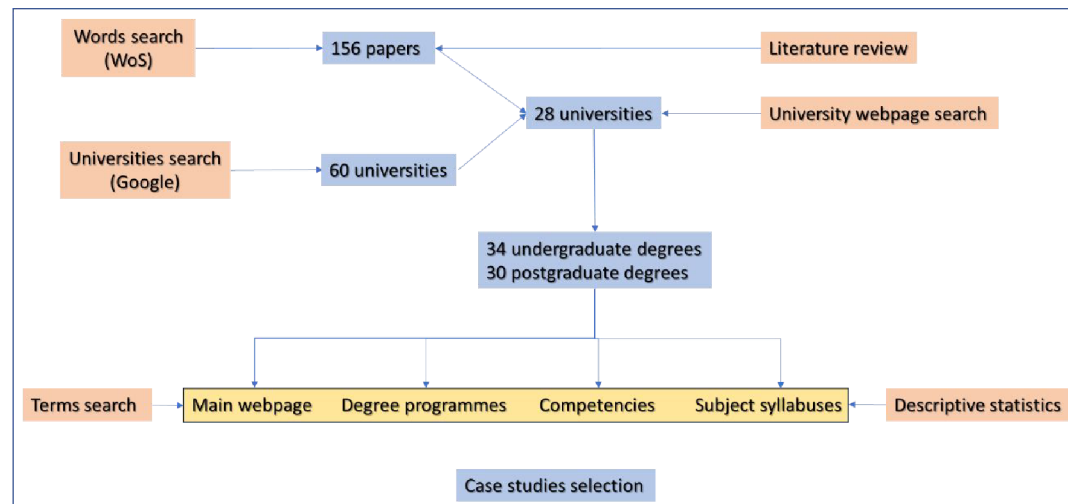


Figure 4. Methodological process followed in this research to assess the approach to sustainability in economics degree programmes

4. Results and Discussion

Articles from WoS-indexed peer-reviewed journals were published in the last decade, the oldest in 2013. All, except Novo-Corti, Badea, Tirca, and Aceleanu (2018), rely on qualitative data relating case studies or interviews. Green (2013) and Novo-Corti et al. (2018) gathered data from students. Both studies find that introducing sustainability in economics degrees has a long way to go. Novo-Corti et al. (2018) find that while public universities are more active in SD initiatives, both public and private institutions need significant efforts to truly address sustainability.

The analysis of 16 universities in WoS-indexed publications is presented in **Table 1**. Some literature referenced universities in unspecified countries (Winter, Zhai, & Cotton, 2022). Others focused on specific subjects (Arnold, 2022; Gálvez-Rodríguez, García de Frutos, Antolin-Lopez, & Sáez-Martín, 2017). Some explored sustainability perceptions among economics students (Aikowe & Mazancova, 2023; Buchtele & Lapka, 2022; Delgado, Venkatesh, Castelo Branco, & Silva, 2020; Gallardo-Milanés, Olivera-Pátaro, & Mezzomo, 2018), not considered for this study. This resulted in 28 university case studies outlined in the methods section, identified through combined searches on WoS (**Figure 3**) and Google. **Table 2** presents results from the Google search on university webpages. Economics degrees of the selected 28 cases presented in **Tables 1** (WoS) and **2** (Google), are discussed.

Table 1 details steps toward sustainability in HEIs' economic education programs. Measuring students' sustainability competence remains a challenge, identified as a future research need (Sandoval, Hasbún, & García, 2017), aligning with Figueiró and Raufflet (2015) study highlighting the lack of articles assessing sustainability's progress in management education and learning outcomes. As Molera et al. (2021), emphasise, implementing the advocated educational paradigm shift requires the commitment of all teachers. Stough et al. (2021) reveal that programmes focusing on sustainability topics can positively influence sustainability integration in other programmes through cross-pollination. Griffith and Moore

(2020) compare teaching approaches in economics and sociology, highlighting innovative strategies like the flipped classroom in a Jamaican university to engage students and integrate sustainability into the curriculum, linking units to the SDGs.














Table 1. University case studies selected based on the WoS search



















Case study	Programme and scope	Characterisation and implications	Reference
The University of British Columbia (Canada) Simon Fraser University (Canada) The University of Victoria (Canada) – Gustavson School of business	Signatories of the Talloires Declaration commits to promoting sustainability and integrating it across curricula, particularly in introductory economic courses. The declaration and signatories can be viewed on the Association of University Leaders for a Sustainable Future website (ULSF, n.d.).	Qualitative study with 54 student interviews on recent introductory economics courses at one of three universities reveals that the curriculum undermines sustainability commitments.	Green (2013)
Universidad de Chile	The University of Chile, aligned with the Talloires Declaration, engages in the "EcoFEN for a Sustainable Campus" initiative (FEN, 2015). This includes integrating social responsibility into undergraduate curricula, promoting sustainable classrooms, using case studies for sustainability, offering sustainability courses, and providing social internships. The Economics program emphasizes ethical practice, transparency, and economic and social wellbeing.	EcoFEN's qualitative study (2007-2015) at the University of Chile's School of Economics explores sustainability. It advocates integrating sustainability into the curriculum, altering institutional consumption practices, and promoting activities with the university community and sustainable entrepreneurs. A future challenge is establishing a permanent sustainability research line.	Sandoval et al. (2017) FEN UCHILE (n.d.)
Bucharest University of Economic Studies, "Constantin Brancusi" University from Targu-Jiu, Bucharest University, Politehnica University of Bucharest, Hyperion University, Cantemir University, and University from Craiova, Alexandru Ioan Cuza University and Stefan cel Mare University from Suceava (Romania)	Romania's economic HEIs are gradually adapting to environmental requirements through programs, projects, and debates on sustainable development.	Quantitative study with 1,250 respondents (students, master's, and PhD) from Romanian economic faculties. <i>t</i> -test and ANOVA identified differences. All programs require attitude and mentality changes. Public universities in Romania are more engaged in sustainable development initiatives, with positive student reactions.	Novo-Corti et al. (2018)
University of the West Indies (Jamaica)	Economic planning equips students for organizational, regional, or macroeconomic planning, covering SDGs in various topics throughout the course.	A case study comparing economics and sociology shows the need to integrate sustainability and SDGs into course delivery.	Griffith and Moore (2020)
University of Murcia (Spain)	The University of Murcia's Faculty of Economics and Business conducted a pilot project to implement Curricular	Qualitative study on a pilot project for teaching innovation aimed at integrating sustainability	Molera et al. (2021)

Case study	Programme and scope	Characterisation and implications	Reference
	Sustainability in the Economics Degree.	into the Economics degree. It produced a Sustainability Competency Map and learning resources to guide the inclusion of sustainability content in teaching practices.	
KU Leuven Faculty of Economics and Business (FEB) (Belgium)	Bachelor in Economics, Master of Business Economics, Master in Economic Policy, and Master of Economics from Leuven. The university integrates Ethics, Responsibility, and Sustainability (ERS) into the business faculty curricula.	Belgian university case study reveals a 'broad, horizontal' approach effectively integrates sustainability into business/economics courses. This approach aids internal strategy by identifying high and low integration levels and understanding the impact of variables like instructor characteristics.	Stough et al. (2021)

Table 2 shows Google search findings on university webpages. Sustainability studies are predominantly at the graduate level (7 out of 12 cases). While most programmes cover sustainability broadly, each programme's focus varies, contributing to different areas related to the 17 SDGs.

Table 2. University case studies selected based on the Google search

Case study	Programme and scope	Characterisation and implications	Reference
Barcelona School of Economics (Spain)	Specialised Master's in Energy Economics and Sustainability provides advanced insights into the evolving energy sector. Explore economic theory and data tools to grasp its dynamics and trends.	1 Graduate level 7 subjects SDGs 7, 13  	BSE (n.d.)
Università Degli Studi Dell 'Insubria (Italy)	Economics and Innovation Sustainability degree imparts skills to analyse enterprise functioning, emphasizing innovation and sustainability.	1 Undergraduate level 6 subjects SDGs 3, 7, 8, 10    	UNINSUBRIA (n.d.)
University of Technology Sydney (Australia)	Economics and Sustainability degrees provide analytical skills for economic principles and multidisciplinary knowledge for the green economy	2 Undergraduate level 5 subjects SDGs 10, 11, 13   	UTS (n.d.)
Norwegian University of Life Sciences (Norway)	Master's in Applied Economics and Sustainability covers micro and macroeconomic theory, empirical methods, and public economics with a focus on sustainability.	1 Graduate level 8 subjects SDGs 1, 10, 12, 13    	NMBU (n.d.)
Northumbria University	The Master in Economics and Sustainability offers advanced	1 Graduate level	Northumbria (n.d.)

Case study	Programme and scope	Characterisation and implications	Reference
(Newcastle, United Kingdom)	training in sustainability economics and policies, along with a solid foundation in environmental and resource economics.	3 subjects SDGs 12, 13  	
The Ohio State University	The Environment, Economy, Development, and Sustainability major is a multidisciplinary program focusing on economic, business, and social aspects of sustainability. It equips students with essential knowledge and skills for careers in sustainability across various sector.	1 undergraduate level 19 subjects SDGs 2, 7, 10, 11, 12     	OSU (n.d.)
Torrens University Australia	The Master of Economics of Sustainability enhances skills for a career in sustainability economics, covering advanced concepts in ecological economics, modern monetary theory, and financial systems while fostering critical thinking and problem-solving.	1 Graduate level 4 subjects SDGs 7, 8  	Torrens (n.d.)
Ca' Foscari University of Venice (Italy)	Masters in Economics, Finance, and Sustainability integrates climate change's impact on sustainable development, merging finance and sustainability. Students learn to assess, understand, and manage sustainable development dimensions, considering risks and opportunities for institutions and the economic system.	1 Graduate level 8 subjects SDGs 7, 14  	UNIVE.IT (n.d.)
Universität Oldenburg (Germany)	Sustainable Economics bachelor's program addresses economic causes and solutions for transforming towards a responsible, sustainable society.	1 Undergraduate level 6 subjects SDGs 7, 10  	UOL (n.d.)
Wageningen University & Research (The Netherlands)	Master's in Economics of Sustainability emphasizes economic interactions with the environment. Students learn quantitative techniques and theories at micro, behavioural, and institutional levels.	1 Graduate level 5 subjects SDGs 8, 9, 17   	WUR (n.d.)
Massey University (New Zealand)	The Master in Sustainable Development Goals (Economics for Sustainability) emphasizes UN SDG theory and practice, addressing the critical imperative of sustainability.	1 Graduate level 5 subjects SDGs 8, 9  	Massey (n.d.)
Universidad Autónoma de Nuevo León (Mexico)	Economics degree aims to produce graduates with a holistic perspective, dedication to social welfare, and global	1 Undergraduate level 3 subjects	UANL (n.d.)



Case study	Programme and scope	Characterisation and implications	Reference
	competence. Equipped with deductive analytical reasoning and critical thinking, they can address economic and social challenges at regional, national, and international levels.	SDGs 8, 16  	

Figure 5 emphasizes SDGs importance in economic studies. Undergraduate programmes mainly address SDG10 - 4 studies and SDG7 - 3 studies. Graduate studies equally tackle issues related to SDG7, SDG8 and SDG13.

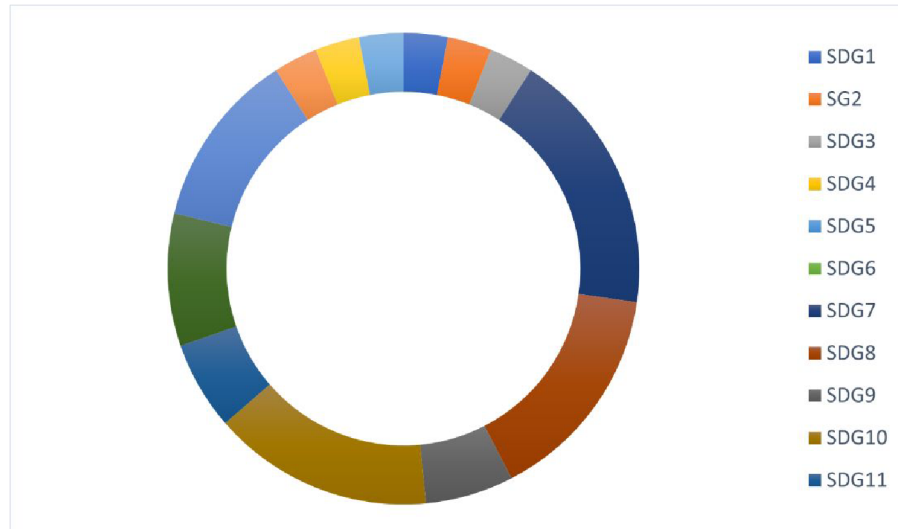


Figure 5. Importance of the sustainable development goals in economic studies

Table 3 lists 34 undergraduate and 30 graduate economic degrees from selected universities, sourced from WoS and Google searches. It outlines if sustainability is mentioned in the degree description, title, and syllabus, as well as its integration into student competencies, where applicable.

Table 3. Information on the integration of sustainability in the analysed university case studies

University	Undergraduate studies	n	G	S	C	Graduate studies	n	G	S	C
University of British Columbia, Canada	1. International Economics	5	Y	N	N					
	2. Economics (BA)	2	Y	N	N					
	3. Economics (BSc)	-	Y	N	N					
	4. Food and Resource Economics	12	Y	Y	N					
	5. International Economics	4	Y	Y	N					
	6. Mathematics and Economics	-	N	N	N					
	7. Philosophy, Politics and Economics	1	Y	Y	N					
Simon Fraser University, Canada	8. Economics	2	Y	N	N	1. Economics	1	N	Y	N
	9. Political Science and Economics Joint Major	-	Y	N	N					
University of Chile, Chile						2. Applied Economics	1	N	N	N
						3. Economic Analysis	2	N	N	N
						4. Economics	1	N	N	N
Bucharest University of Economic Studies, Romania	10. Agri food and Environmental Economics	13	Y	N	Y	5. Economics and Administration of Agri-food Business	1	N	N	N
	11. Economic Cybernetics	1	N	N	N	6. Ecological Economics	10	N	N	N
	12. International Business and Economics	1	N	N	N	7. Cybernetics and Quantitative Economics	-	N	N	N
	13. Economics and Economic Communication in Business	-	N	N	N	8. Economic Informatics	-	N	N	N
	14. International Business and Economics	1	N	N	N	9. Sustainable development of business and economic organizations	11	N	N	N
						10. European Economics	-	N	N	N
						11. Economics Didactic	-	N	N	N
					12. Diplomacy International Economy	-	N	N	N	
					13. International Economics and European Affairs	-	N	N	N	
Constantin Brancusi University from Targu-Jiu, Romania	15. Trade, Tourism and Service Economy	-	N	N	N					
	16. Economic informatics	-	N	N	N					

University	Undergraduate studies	n	G	S	C	Graduate studies	n	G	S	C
University of Bucharest, Romania	17. Cybernetics, Statistics and Economic Informatics	-	N	N	N	14. Behavioural Economics	-	N	N	N
Hyperion University, Romania	18. Economics of Trade, Tourism and Service	-	N	N	N					
Dimitrie Cantemir University, Romania	19. Service and Tourism Commerce Economy	-	N	N	N					
Alexandru Ion Cuza University, Romania	21. Cybernetics, Statistics and Economic Informatics	-	N	N	N	15. Economic Informatics	-	N	N	N
	22. Economics and International Affairs.	-	N	N	N	16. Economics	-	N	N	N
						17. Economics and International Affairs	-	N	N	N
Stefan Cel Mare University, Romania	23. Trade, Tourism and Service Economy	2	Y	N	N					
	24. Economic Informatics	-	N	N	N					
	25. General Economics and Economic Communication	-	N	N	N					
University of the West Indies, Jamaica	26. Economics.	1	Y	N	N	18. Economics	-	N	N	N
						19. International Economics and International Law	-	N	N	N
						20. Development Studies	3	N	Y	N
University of Murcia, Spain	27. Economics	4	N	Y	N	21. Economic Development and International Cooperation	3	Y	N	N
KU Leuven University, Belgium	28. Economics	3	Y	N	N	22. Economic Policy	-	N	N	N
						23. Economics	3	N	Y	N
Barcelona School of Economics, Spain						24. The Economics of Energy, Climate Change and Sustainability	7	Y	N	N
University Degli Study Dell'Insubria, Italy	29. Economics and management of innovation and sustainability	6	Y	N	N					
University of Technology Sydney, Australia	30. Economics	1	N	Y	N					
	31. Sustainability and Environment/Economics	4	Y	Y	N					
Norwegian University of Life Sciences, Norway						25. Applied Economics and Sustainability	8	Y	N	N
Northumbria University, UK						26 Economics and Sustainability	3	Y	N	N

University	Undergraduate studies	n	G	S	C	Graduate studies	n	G	S	C
The Ohio State University, USA	32. Environment, Economy, Development and Sustainability	21	Y	N	N					
Torrens University, Australia						27. Economics and Sustainability	4	Y	N	N
Ca' Foscari University of Venice, Italy						28. Economics, Finance and Sustainability	9	Y	N	N
Universität Oldenburg, Germany	33. Sustainable Economics.	6	Y	N	N					
Wageningen University & Research, Netherlands						29. Economics of Sustainability	5	Y	N	N
Massey University, New Zealand						30. Sustainable Development Goals	15	Y	N	N
Universidad Autónoma de Nuevo León, Mexico	34. Economics	3	Y	N	Y					
	Undergraduate sustainability subjects	92				Graduate sustainability subjects	87			

Note. n = number of subjects that include sustainability; G = if sustainability is included in the general description of the degrees; S = if the syllabus of the subject were available; C = if the competencies integrate sustainability; Y = yes; N = no

Despite selecting universities with a sustainability focus based on literature review (WoS) and Google search, only 23 out of 64 degrees include sustainability in their general descriptions. Sustainability is present in 92 undergraduate and 87 postgraduate courses, with detailed syllabuses available in specific degrees. Detailed information about course content is found in less than one-sixth (9 out of 64) of the analysed degrees. Sustainability is included in only two undergraduate degrees. Most universities do not display sustainability competences on their websites. Interestingly, sustainability courses are concentrated in six countries, out of 15 across three continents (**Figure 6**). Romania offers the most courses (40), followed by Canada (27), the United States of America (USA) (21), New Zealand and Italy (15 each), and Spain (14).

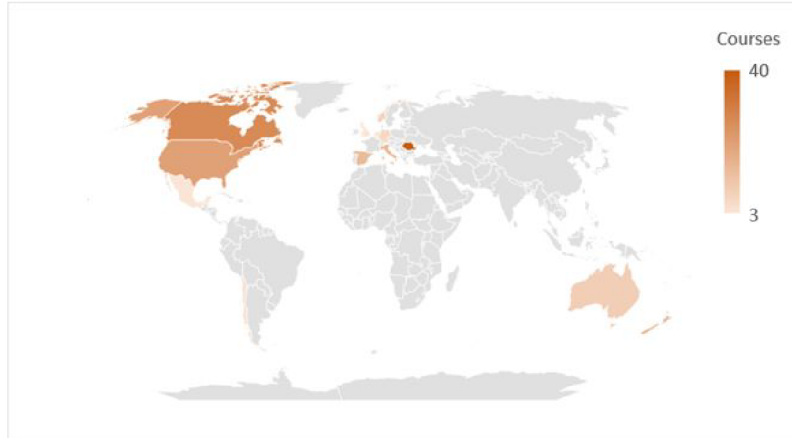


Figure 6. Sustainability being addressed in economics courses, by country

The above information has to be considered with caution, as the number of degrees analysed in each university is very different, varying from 29 in Romania, to only 1 each in Norway, the United Kingdom (UK), the Netherlands and Mexico. Moreover, when the intensity, i.e., proportion of sustainability courses by degree in each country, translated into average values in **Figure 7**, of the sustainability courses in the studies is observed, the picture changes, and the countries with the highest number of courses by degree are USA (21), New Zealand (15), Norway (8), Italy (7.5) Germany (6), the Netherlands (5) and Spain (4.67). All other countries show a symbolic presence of sustainability courses.

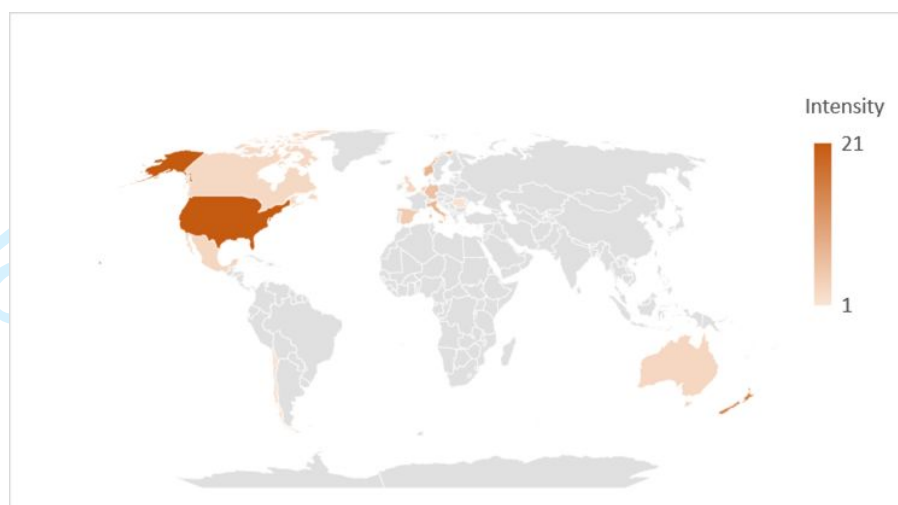


Figure 7. Intensity in sustainability being addressed in economics courses, by country

The critical nature of the situation is evident in this analysis, which focuses on 15 degrees related to sustainability, 10 bachelor's and 5 Master's. Official websites of the analysed degree programmes lack any mention of sustainability in their 'letter of introduction'. Information on competencies is sparse, hindering the influence on future economists and the promotion of global societal change. In Jamaican undergraduate studies, sustainability is only offered optionally, and 3 out of 16 Romanian degrees include sustainability as an elective. The same pattern is observed in Jamaican Master's degrees and 3 analysed Romanian degrees.

5. Conclusions

The significance of education, particularly in universities, for achieving the UN SDGs is widely acknowledged. Education (SDG4) is a specific goal and also a target in several other SDGs. The study aimed to explore sustainability concepts in economics degree programmes within HEIs. The study's conceptual theoretical framework involved a two-phase literature review and bibliometric analysis using the WoS database, focusing on sustainability, economics, education/training, and universities. Google was then used to identify universities offering sustainability in economic degree programmes. 28 relevant university case studies were collected to investigate sustainability in HEIs economics degree programmes. Analysing various university case studies beyond initial WoS and Google searches reveals that sustainability content is predominantly integrated at the undergraduate level. Teaching programme focuses vary, addressing issues like reducing inequalities through economic decisions and promoting affordable and clean energy. Postgraduate studies delve into a more intricate mix of topics, including affordable and clean energy, decent work and economic development, and responsible consumption and production. These findings indicate progress in infusing sustainability concepts into economics education, but additional efforts are necessary for a comprehensive understanding of sustainability objectives. Addressing these challenges may involve curriculum changes. Integrating sustainability into economics programmes must tackle operational issues, such as busy schedules and full timetables. Some cases may require additional training and resources for teaching staff to effectively incorporate sustainability. This, in turn, can foster stronger changes in the attitudes and competencies of economics degree students towards sustainability.

This study, limited by the focus on economics-related programmes in the literature review from WoS, excludes examples from various developing countries among the 28 selected university case studies. It provides insights into current sustainability trends in economics degrees but does not offer a comprehensive global representation. However, this

study identifies a knowledge gap in understanding how sustainability concepts are integrated into economics degree programmes in HEIs. It emphasizes the need to explore pedagogical approaches for incorporating SDGs into economics curricula and assess the impact on students' competencies and attitudes towards sustainability. The study also highlights a lack of knowledge about challenges and barriers to implementing SDGs in economics programmes globally. Thus, and despite limitations, the research contributes to bridging this gap by linking theory to practice, expanding the analysis, and drawing attention to specific characteristics that should be included in economics education programmes for sustainability, providing students with valuable opportunities and societal implications. Further research is needed to evaluate pedagogical approaches integrating SDGs into economics curricula. Additionally, there is a need to understand students' awareness of sustainability issues and how their behaviour and professional practices may change due to sustainability knowledge. Internationally, exploring challenges in implementing SDGs in economics degree programmes worldwide can contribute to developing sustainable economic education in HEIs.

Data availability

All data generated or analysed during this study are included in this published article.

Competing Interests statement

The authors declare no competing interests.

Acknowledgments

This article is part of the "100 papers to accelerate the implementation of the UN Sustainable Development Goals" initiative.

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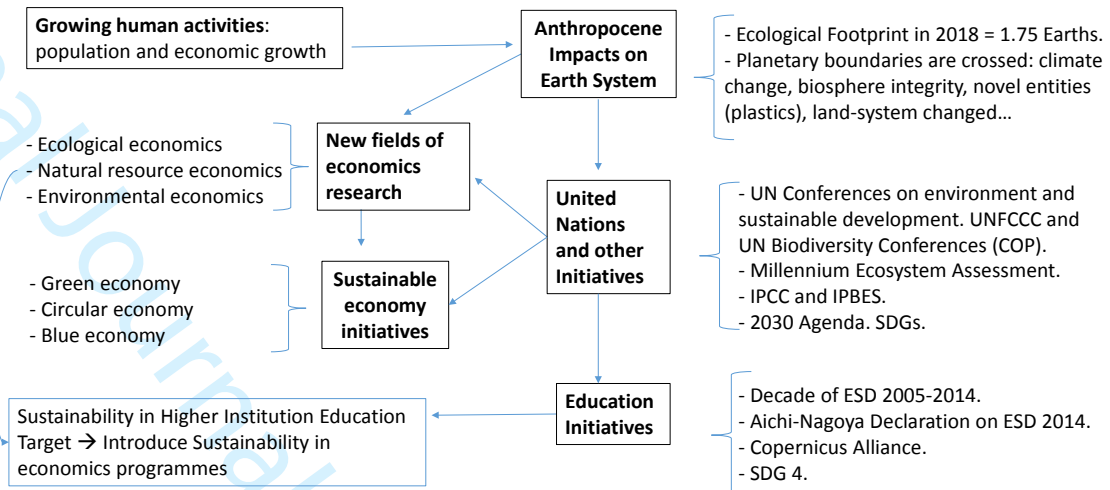
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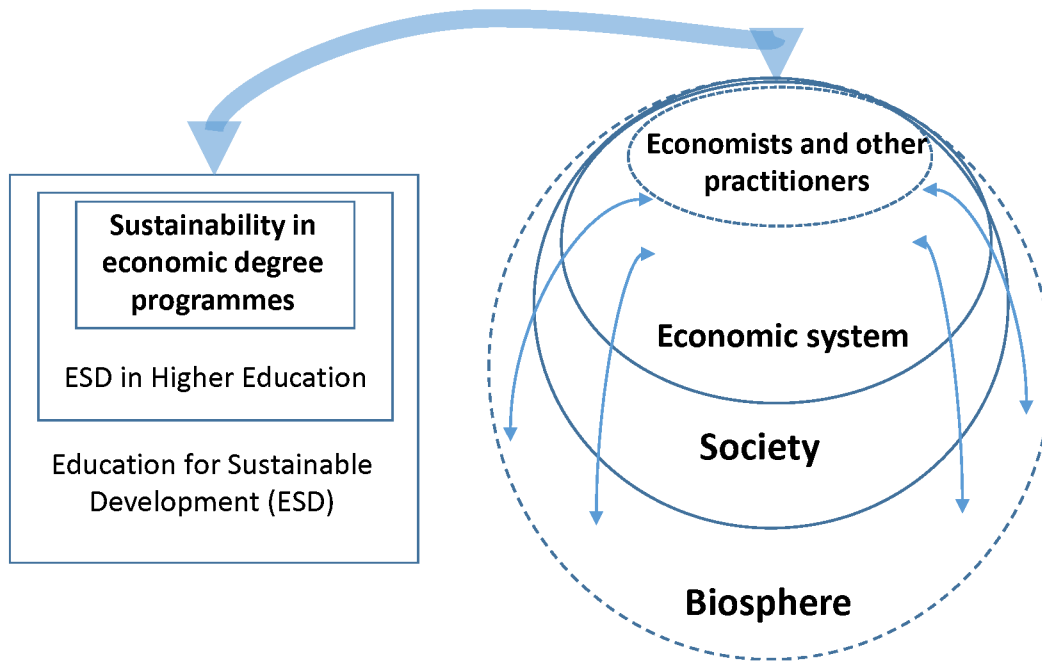
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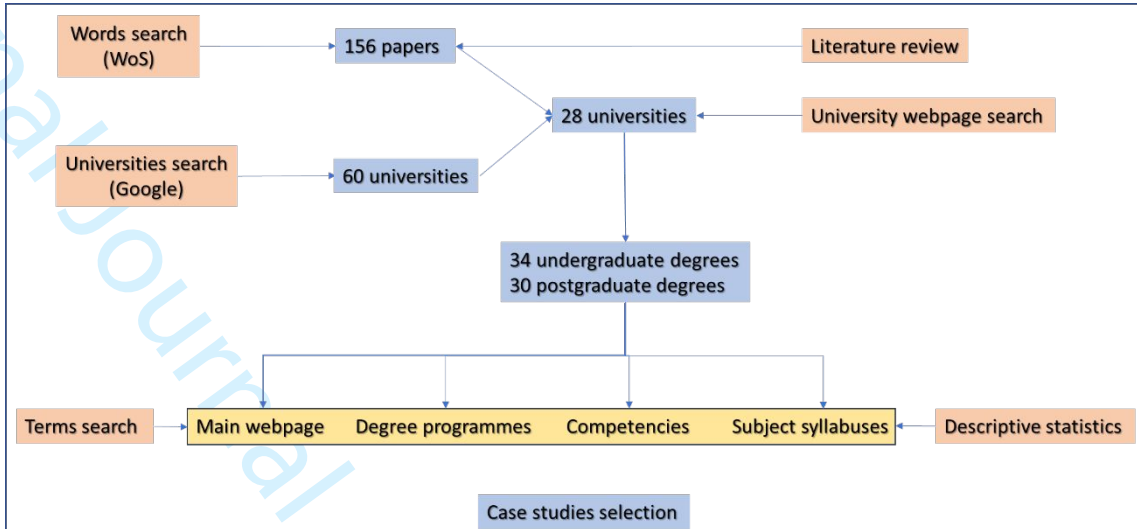


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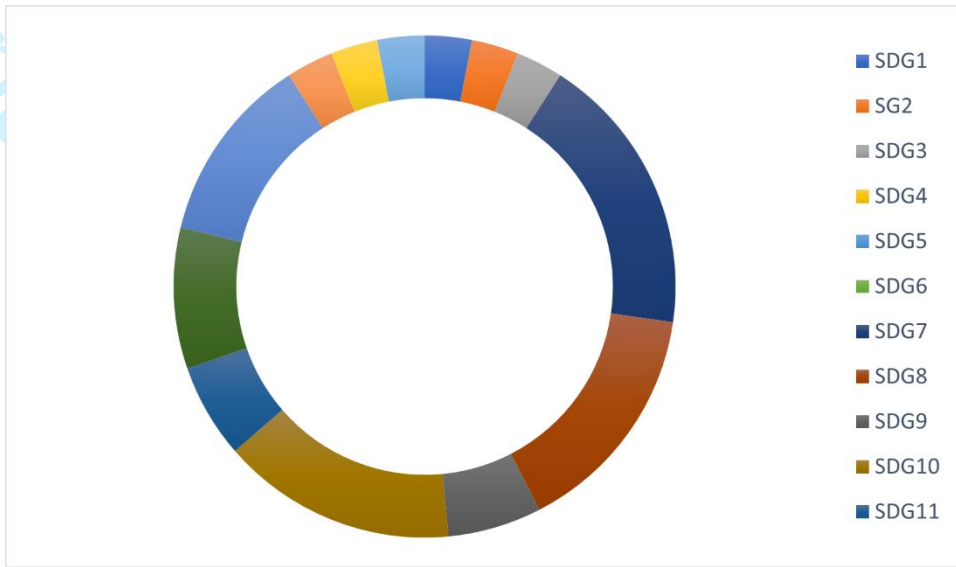


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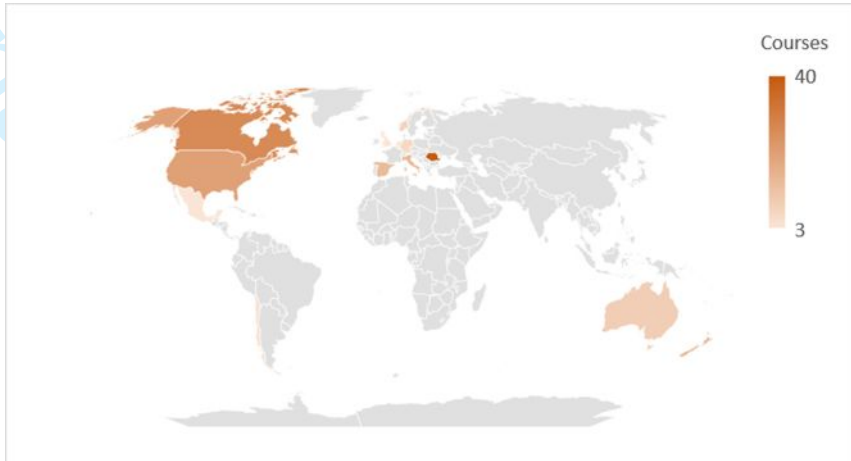
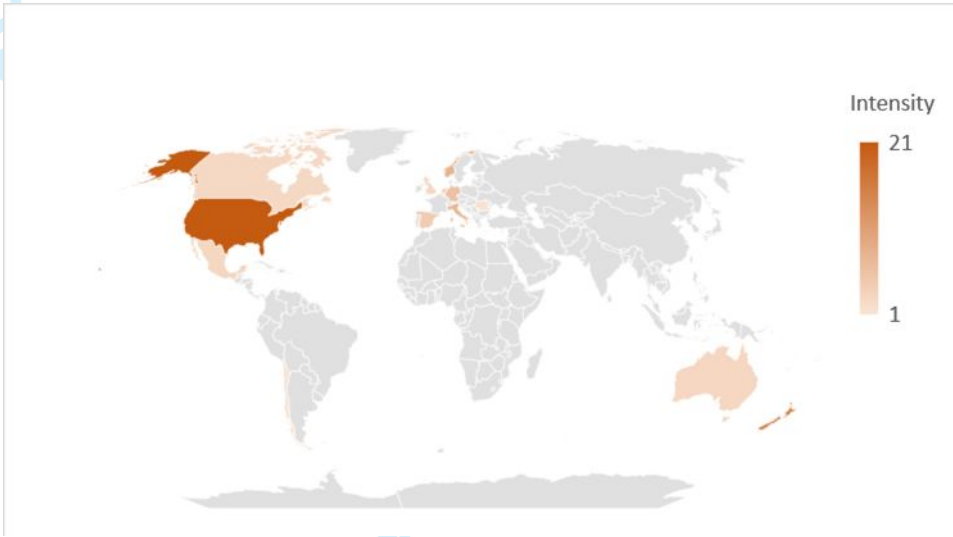


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