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A systematic literature review on the role played by sustainability matters in the educational environment

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ABSTRACT

Given the recent developments in sustainability reporting frameworks, this paper aims to systematically review the research on sustainability matters concerning its implementation in the educational area within the accounting-related courses or higher education institutions overall from a more comprehensive scope of analysis. For this purpose, a systematic literature review combined with a bibliometric analysis was applied, using the Scopus database to collect the papers published in this century (since 2000 onwards). The final sample is comprised of 56 papers, covering different clusters of analysis. The findings indicate an increase in sustainability publications, which aligns with the growing relevance of such issues worldwide. In recent years, studies with practical applications and a more diverse set of methodologies have increased instead of the initial focus on theoretical essays and analyses. Nevertheless, there are still some gaps that can serve as avenues for future research, regarding, for instance, the papers' geographical scope, thematic area and methodologies proposed. This study expands to further topics not found in the literature such as what the classical social science theories have been proposed for evaluation, and the main results/conclusions the studies have reached. Finally, it suggests avenues for future research from the identified gaps and then contributes to the literature.

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1. Introduction

The United Nations (UN) defined sustainable development as meeting 'the needs of the present without compromising the ability of future generations to meet their own needs' (United Nations, 1987, p. 16), and is committed to achieving it in its three dimensions – economic, social and environmental – in a balanced and integrated manner (UN 2030 Agenda).

Sustainability reporting has significantly progressed in recent years to the same extent as the increasing relevance of the Environmental, Social and Governance (ESG) frameworks. As a trustee that has under its aegis a global standard-setter body with the role of issuing the International Financial Reporting Standards (IFRS), the International Accounting Standards Board (IASB), the IFRS Foundation recently created a new one, the International Sustainability Standards Board (ISSB), aiming to issue IFRS Sustainability Disclosure Standards (IFRS S).

The ISSB issued its first two IFRS Ss on 26 June 2023. Specifically, the General Requirements for Disclosure of Sustainability-related Financial Information (IFRS S1) has the framework for the disclosure of material information about sustainability-related risks and opportunities across an entity's value chain), and the Climate-related Disclosures (IFRS S2) sets out requirements for entities to disclose information about climate-related risks and opportunities.

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In the European Union (EU) context, the European Financial Reporting Advisory Group (EFRAG) has recently gained the new duty of ensuring an ambitious and robust development of high-quality EU sustainability reporting standards, besides technical advice to financial reporting that already had. The European Commission has also strengthened the rules concerning the report on social and environmental information by companies through the issuance of the Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022, the Corporate Sustainability Reporting Directive (CSRD), which entered into force on 5 January 2023, with the deadline for adopting sector-specific European Sustainability Reporting Standards (ESRS) being postponed by 2 years. A broader set of large companies and listed small and Medium Enterprises, as well as some non-EU companies, will now be required to report on sustainability.

The CSRD emphasises that ‘sustainability matters mean environmental, social and human rights and governance factors’. According to paragraph 45, ‘Sustainability reporting standards should also take account of internationally recognised principles and frameworks on responsible business conduct, corporate social responsibility, and sustainable development, including the Sustainable Development Goals (SDGs) (...)’.

It was also issued the Directive (EU) 2024/1760 of the European Parliament and of the Council of 13 June 2024 on corporate sustainability due diligence, which came into force on 25 July 2024. According to paragraph 16, this Directive aims to foster sustainable and responsible corporate behaviour regarding human rights and environmental impacts in companies’ operations and across their global value chain.

Therefore, sustainability reporting has become more challenging and there’s a need to have professionals with the necessary knowledge, where Higher Education Institutions (HEIs) play a relevant role (Gomes et al., 2021), being vital in implementing Education for Sustainable Development (ESD). The SDGs, particularly Goal 4.7, highlight the role of education in promoting sustainable development by stating that by 2030, it must be ensured ‘that all learners acquire the knowledge and skills needed to promote sustainable development’. Other initiatives such as the United Nations Educational, Scientific and Cultural Organisation (UNESCO) Global Action Programme on ESD and the ESD for 2030 framework guide countries in implementing ESD strategies. Moreover, HEIs are increasingly adopting sustainability assessment tools, namely to foster campus sustainability and a sustainability culture (Singh et al., 2023).

Then, HEIs cannot be absent from society’s increasing concerns and requirements regarding sustainability (Fülöp et al., 2022, 2023). By Fülöp et al. (2022), the theme of sustainability in HEIs can be approached from two key perspectives: their educational mission and the institution’s practices and actions.

The literature has been addressing the challenge of incorporating sustainability in higher education (Gomes et al., 2021), namely by systematically reviewing what has been researched (Frizon & Eugénio, 2022). For instance, the ESD has been researched through systematic literature reviews, particularly regarding SDGs (Fia et al., 2023), ESG (Lima et al., 2023), corporate social responsibility (CSR) (Adhikariparajuli et al., 2021), sustainability (e.g. Frizon & Eugénio, 2022; Lim et al., 2022; Pegalajar-Palomino et al., 2021; Vargas-Merino et al., 2024), or even the HEIs sustainability (e.g. Gutiérrez-Mijares et al., 2023; Singh et al., 2023).

From a broader perspective, Carnegie et al. (2021) have proposed a novel definition of accounting, highlighting its role in contributing to a more balanced perspective on the planet, people and profit. Notwithstanding, the authors recognise that its full potential as a technical, social and moral practice has yet to be realised. Considering this, it is relevant to study how the accounting-related courses in HEIs have been addressing their responsibility to fulfil that objective.

Given the recent developments in sustainability reporting frameworks, this paper aims to systematically review the research on sustainability matters concerning its implementation in the educational area within the accounting-related courses or HEIs overall from a more comprehensive scope of analysis. Papers from the Scopus database were collected for this purpose in this century (from 2000 onwards).

Since sustainability is a broader concept, this study will focus on those matters increasingly covered by accounting courses regarding the contextualisation previously proposed. Then, it includes in its scope themes such as the entities’ social responsibility concerns, disclosures on non-financial information, green finance strategies and the ESG dimensions. On the other hand, it excludes the more traditional financial perspective of sustainability.

This study expands to further topics not found in the literature such as what the classical social science theories have been proposed for evaluation, and what are the main results/conclusions that the studies have reached. Then, it proposes avenues for future research from the gaps found, which can contribute to the literature on this field.

For this purpose, this research defined the following six research questions or sub-questions (RQ), whenever applicable:

- **RQ1:** How has the number of publications evolved?
- **RQ2:** Which sources of publications are the most relevant in terms of the number of publications and citation count?
- **RQ3:** Which authors are the most relevant in terms of the number of publications and citation count?
- **RQ4:** Which institutions and countries of affiliation of the authors are the most representative?
- **RQ5:** What are the main underlying themes of the identified publications? Within each theme, the aim is to identify the following issues:
 - **RQ5.1:** What is the territorial scope of the identified articles?
 - **RQ5.2:** What are the main methodological lines followed in the development of the publications?
 - **RQ5.3:** Which components of ESG have received the most focus in these publications?
 - **RQ5.4:** What are the main proposed teaching methodologies?
 - **RQ5.5:** What are the main courses and levels of education studied?
 - **RQ5.6:** Which classical theories of social sciences have been proposed for evaluation?
- **RQ6:** What are the main results/conclusions reached by the studies?

This paper is structured in three sections, in addition to this introduction. The next provides the materials and methods. The third presents the findings. Finally, the last discusses those findings and outlines the main conclusions.

2. Materials and methods

This research applies a systematic literature review combined with a bibliometric analysis. The first consists of a qualitative analysis of the papers gathered through their content underlying the RQ5 and RQ6, namely in what concerns their objectives, object, thematic focus, territorial scope, sample, theoretical framework, approaches, methods and main findings. Then, the bibliometric analysis essentially provided additional insights based on intellectual structure analysis to answer the RQ5 through a co-citation technique, as well as the proposed clusters, using a bibliographic coupling procedure. The VosViewer was the auxiliary tool used for this purpose. Besides, the data and charts provided by the Scopus database summarise the answers to the first RQ1 to RQ4, since this is the relevant source of information used for this research. Therefore, the analysis covers both performance analysis and science mapping techniques (Donthu et al., 2021; Mukherjee et al., 2022).

The relevant period is from 2000 to 2024 (all available information on 25 July 2024), representing almost a quarter of this century of research on sustainability concerning educational matters in the accounting area or HEIs in general from a comprehensive scope of analysis.

To select the appropriate papers for analysis, this research globally follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework as proposed by Page et al. (2021). The search syntax initially contains the terms related to education in the papers' titles, namely the words 'education', 'students', 'higher education institution' and 'university', as well as the verbs 'learn' and 'teach', including the likely associated terms with them in its acronyms and plurals. It is worth mentioning that, on the other hand, the term 'machine learning' must be excluded, since it biased the analysis. Then, the terms related to sustainability matters, such as 'sustainability', 'social responsibility', 'non-financial information', 'green finance', 'ESG' were also included. Finally, the terms related to accounting within the papers' abstract were also proposed. Further conditions were included in the search syntax to increase the comparability, namely the language (English), the publication period (from 2000 onwards), the type of publication (article) and the stage of publication (final).

The search initially delivered 78 papers. Notwithstanding, some of them (20) were excluded considering that they were exclusively focused on sustainability from a financial perspective (long-term sustainability of a given project, course or entity), given that they were not in the scope of this research, which was difficult to avoid from the definition of the search syntax. Following, one paper was excluded since it did not cover accounting or related areas (economics, finance or business), to increase the comparability of the findings. Finally, a duplicate record was also excluded from this sample research since it represented a new release of a previously published paper ('reprint of') and already considered in the analysis. Figure 1 summarises this process, including the complete search syntax with the Boolean operators used.

The next section provides the findings from the analysis of the papers gathered.

3. Results

To answer **RQ1**, Figure 2 illustrates how papers on the scope of this research have evolved. A general trend of increasing publication numbers can be observed, despite some irregularities, especially since 2017, with the peak being reached in 2018 (8 papers), followed by 2022 and 2020 (7 and 6 papers, respectively). Furthermore, about two-thirds of the papers collected for this research (38 papers or 68% of the sample) were published since then.

Regarding **RQ2**, Table 1 identifies the sources of publications where at least 2 papers which accomplished the search criteria were found, also providing the total numbers of citations and the average values for them (total citations divided by the number of papers).

Table 1 shows that 10 different sources of publications can be identified as the most relevant, with half having at least four papers each. These 10 sources out of 32 of them that were found (31%) integrate 34 papers (61%) and 587 citations (68%), with an average citation of about 59. This latter number compares with an average value of only 27 found for all sources. This indicates a relatively high level of concentration of relevant publications in those sources. The SAMPJ, the AE and the IJSHE can be highlighted in this group by the number of citations their papers in the scope of this research have achieved.

The first (SAMPJ) includes two of the most cited papers, namely the one by Mader et al. (2013) – the most cited one – and that by Schaltegger (2021), with 82 and 44 citations, respectively. Both papers are related to stakeholders' perceptions of the implementation of sustainability in the accounting curricula and/or about the effects of implementing and assessing sustainability matters in general. The AE also includes two relevant papers, the ones by Coulson and Thomson (2006) and Gray (2013), with 47 and 38

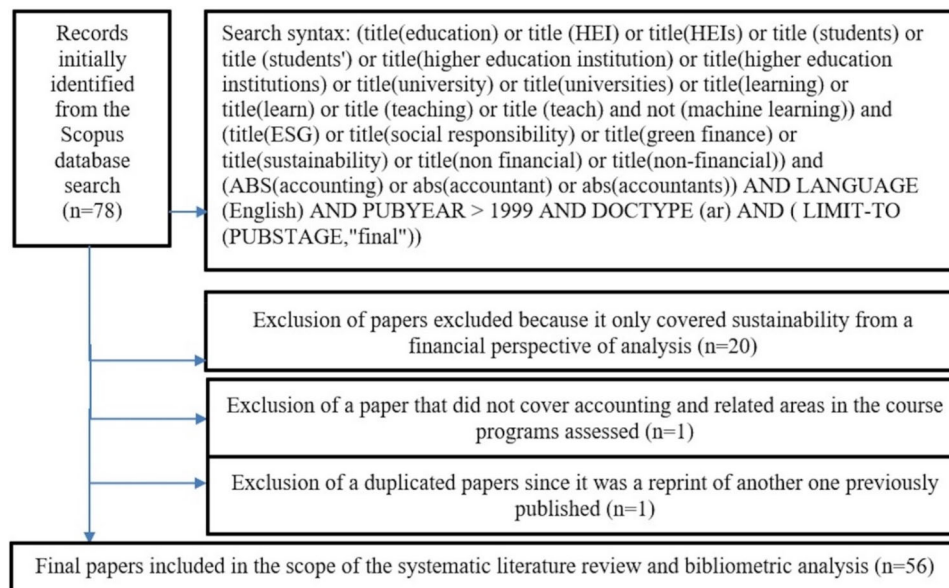


Figure 1. Search criteria for collecting the papers.

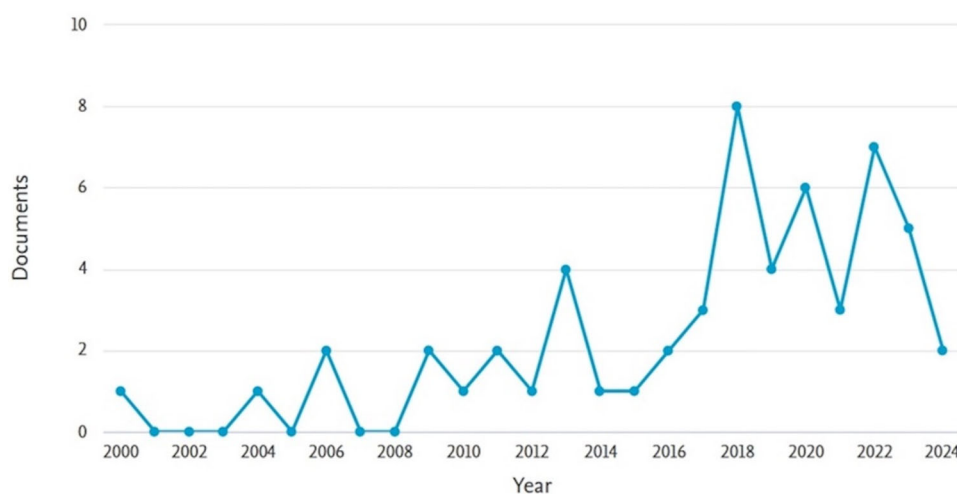


Figure 2. Papers published by year.

Table 1. Most relevant sources of publications.

Sources	Number of papers	Total citations	Average citations
International Journal of Sustainability in Higher Education (IJSHE)	6	71	12
Sustainability (Switzerland) (Sust)	5	37	7
Accounting Education (AE)	4	101	25
Social and Environmental Accountability Journal (SEAJ)	4	24	6
Sustainability Accounting, Management and Policy Journal (SAMPJ)	4	176	44
Journal of Accounting Education (JAE)	3	70	23
Journal of Global Responsibility (JGR)	2	20	10
Social Responsibility Journal (SRJ)	2	17	9
International Journal of Management Education (IJME)	2	28	14
Spanish Accounting Review (SAR)	2	43	22
Total	34	587	59

citations, respectively. These relate to practical applications and an essay, respectively, on sustainability matters in accounting education. Finally, the IJSHE includes the second most cited paper, namely the one by Meseguer-Sánchez et al. (2020), on the implementation and assessment of sustainability in HEIs. As will be mentioned later, those papers comprise the four main cloisters found in this research, based on their different thematic areas and approaches.

Concerning the most relevant papers based on the number of citations (**RQ3**), it can be observed that the average citation is about 15 citations. Only two papers, published in 2013 and 2014, have no citations at this time, namely those by Albuquerque et al. (2023) and Stewart (2024). Following, 17 papers reached between 1 and 5 citations, while 19 others had between 6 and 15 citations (the average number). Finally, a total of 18 papers have more than 15 citations.

From this latter group, 8 papers achieved at least 30 citations, namely, and from the lowest to the highest, Larrán et al. (2018), Gray (2013), Schaltegger (2021), Coulson and Thomson (2006), Lehmann et al. (2009), Wyness and Dalton (2018), Meseguer-Sánchez et al. (2020) and, finally, Mader et al. (2013). Therefore, only two papers from this group were published in the first decade of this century, while two others were published in 2020, which represents a relatively recent year. The maximum amount reached for the paper by Mader et al. (2013) represents 81 citations, followed by the one by Meseguer-Sánchez et al. (2020) with 62 citations and, then, the 58 citations obtained for the work by Wyness and Dalton (2018). Finally, all remaining papers had between 30 and 50 citations.

These papers covered different thematic areas and approaches, including essays and case studies on the introduction of sustainability matters in accounting education (e.g. Coulson & Thomson, 2006; Gray, 2013), empirical research on the students' perspectives regarding those topics in this context (e.g. Larrán et al., 2018; Wyness & Dalton, 2018), an essay on the discussion of sustainability within the specific Covid-19 pandemic environment (Schaltegger, 2021), essays and case studies on the implementation of sustainability indicators, their measurements and performance assessments in HEIs, sometimes also

including the discussion of the introduction of sustainability in the curricula of HEIs (Lehmann et al., 2009; Mader et al., 2013), as well as a literature review on this latter group of research (Meseguer-Sánchez et al., 2020).

Following, Figure 3 shows that eight authors have reached at least two published papers, which does not indicate a significant level of expertise concentration in a reduced number of authors. None of these authors integrates the set of most cited authors (above 30 citations), except the one by Coulson and Thomson (2006) in their study on sustainability in accounting education. It is relevant to notice that some authors may not appear in this list because of their different name indications, as happened with 'Eugenio, T.' and 'Eugénio, T' who represent the same author with a single ORCID.

To answer RQ4, Figures 4 and 5 show, respectively, the country or territory and the institutions of the authors' affiliations.

Figure 4 indicates a prevalence of Anglo-Saxon countries, namely the United States (US), which is the most representative country, the United Kingdom (UK), Australia and New Zealand. Individually, Canada appears as the second one, with six papers including authors from this country, together with Spain. Then, a set of European Union countries emerged as relevant, namely Spain, Germany, Portugal, France, Italy and the Netherlands. Finally, Brazil, Turkey and Indonesia are the countries outside those groups that also appear as the most representative, despite being included in this list with only two papers by authors from this nation. It is worth stressing that none of the African countries have an author with at least a single paper within the scope of this research.

Despite the previous evidence, Figure 5 shows that also the institutions of authors' affiliations are highly dispersed, with a maximum of two papers representative of a single institution. Those include institutions from New Zealand (The University of Walkato), the Netherlands (Rijkuniversiteit Groningen), Spain (Universidad de Jaén), Portugal (School of Technology and Management; Polytechnic Institute of Leiria; CARME) and Canada (Université Laval). The US is the only country that appears in this list with two distinct universities or polytechnics, namely the Duquesne University and the University of Northern Iowa. It is relevant to stress that, in the case of Portugal, both the School of Technology and Management and CARME integrate the same institution (the Polytechnic Institute of Leiria).

To answer RQ5, Figures 6 and 7 provide the co-citation network and bibliographic coupling, respectively, as auxiliary tools to illustrate the relationship between the cited authors, and papers referenced. From this analysis, the main topics can be implicitly identified.

As shown in Figure 6, Gray's (2013) essay on sustainability education in accounting assumes relevance to the linkage of the various topics of research in this study. The comprehensive work of Mader et al. (2013), which includes an analysis of the HEIs and their sustainability assessments, provides additional support for a distinct group. Additionally, Wyness and Dalton (2018), which provides a student perspective from a case study with a practical application, is also relevant to link the remaining topics related to sustainability in accounting education. This includes, for instance, the stakeholder views on Al-Hazaima

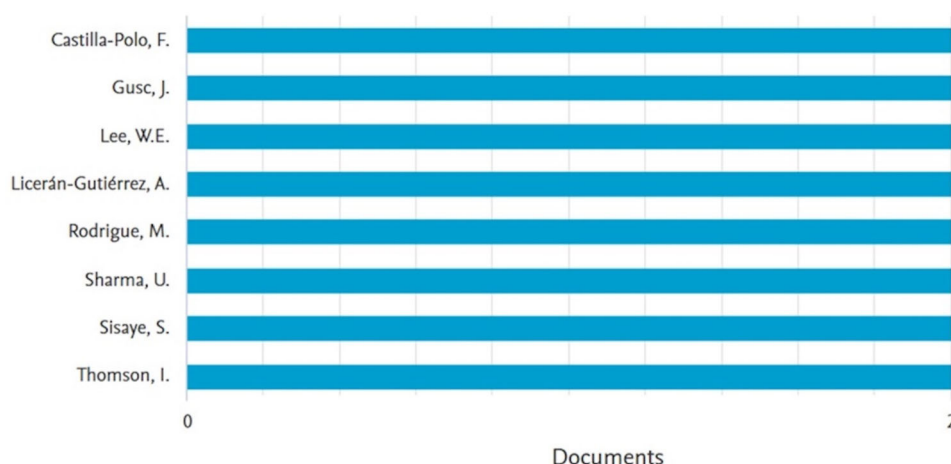


Figure 3. Papers published by authors.

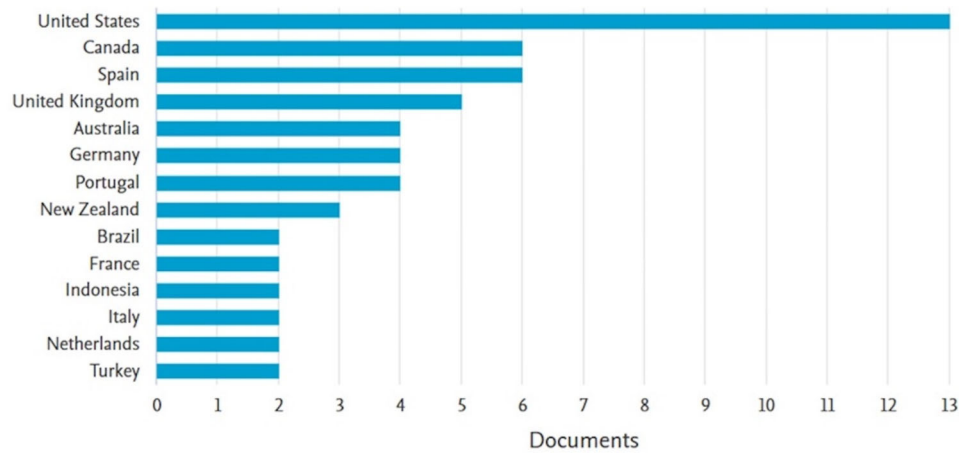


Figure 4. Papers published by country or territory.

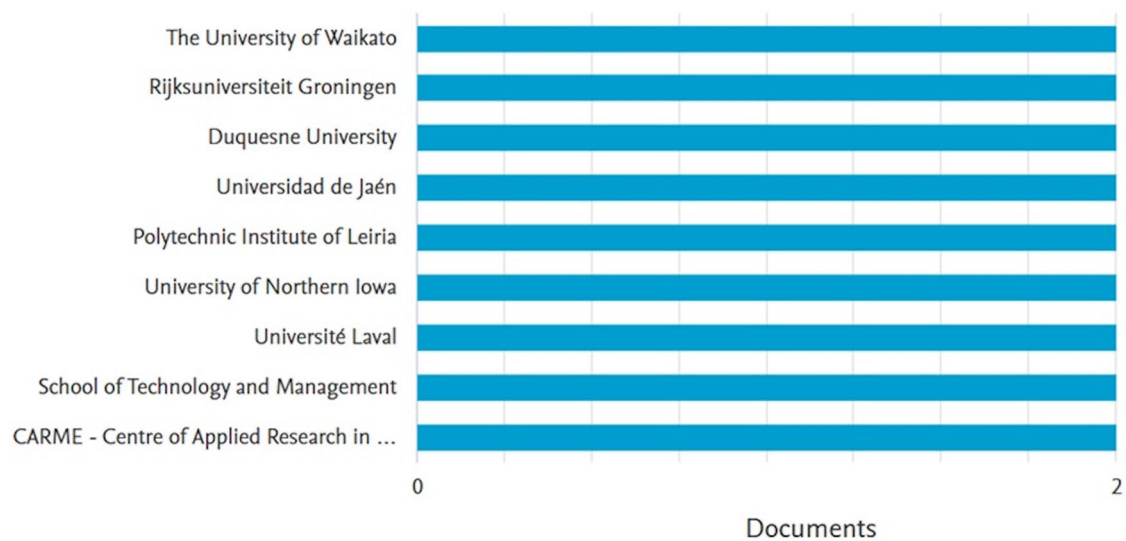


Figure 5. Papers published by authors' affiliations.

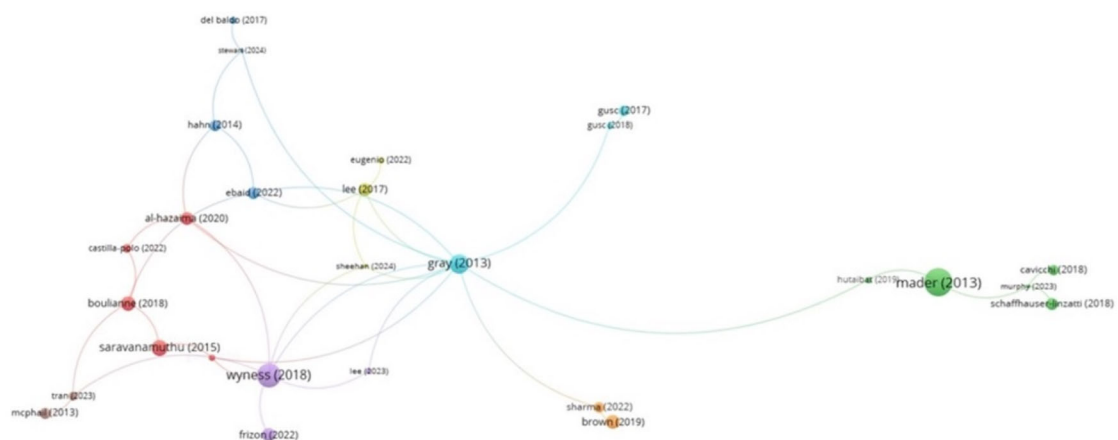


Figure 6. Co-citation network.

et al. (2021) proposal as well as Lee et al. (2017) and Lee and Perdana (2023) proposals, which cover either students or other communities.

Nonetheless, and despite the above evidence, it is worth stressing that some relationship networks seem to not properly distinguish the group of interest by topics. This can be likely explained by the

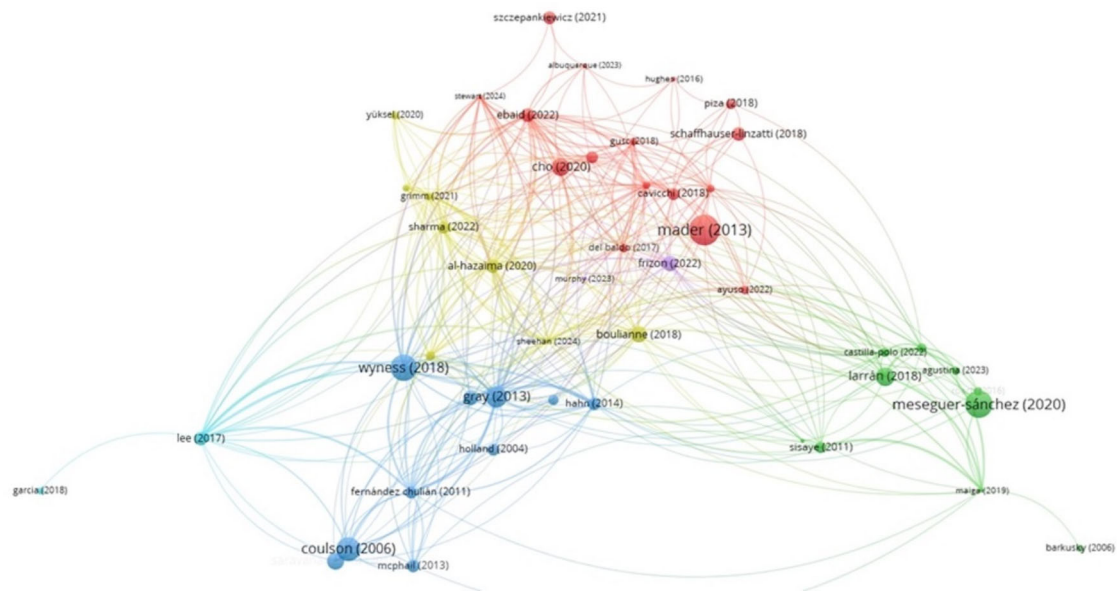


Figure 7. Bibliographic coupling.

authors' use of support based on sustainability matters as their focus for research regardless of their diverse specific purposes, such as the analysis of its implementation in a course or through the global perspective of a given HEI, the students' perspectives or other stakeholders' views.

From Figure 7, four groups of papers (hereinafter mentioned for simplification purposes as clusters and assessed by colours) were more evidently found. However, similar to the previous chart, a similar pattern inside those clusters is not found. Specifically, the red cluster, which includes the previously mentioned work by Mader et al. (2013) on the sustainability analysis of HEIs, also has the works by Albuquerque et al. (2023) and Ebaïd (2022), for instance, on the students' perspectives and motivations to learn sustainability matters. The dark green cluster includes the research by Larrán et al. (2018) and Meseguer-Sánchez et al. (2020), the first more related to the students' attitudes and perceptions of sustainability, i.e. the research topic also found within the red cluster, and the latter being a literature review on the socio-economic and environmental dimension of HEIs social responsibility. Following, the light green one includes the research by Boulianne et al. (2018), on the analysis of the coverage of sustainability matters by the accounting curricula in French HEIs, but also the one by Al-Hazaima et al. (2021) on the stakeholders' perceptions about their inclusion in accounting education. Finally, the blue cluster is comprised of the essay by Gray (2013) on sustainability matters in accounting education but also case studies on their effective implementations, such as the research by Coulson and Thomson (2006), and the students' perspectives from their learning process, proposed by Wyness and Dalton (2018), which are research topics also covered by the previous clusters.

As a consequence, the assumptions underlying VosViewer as a tool for identifying relevant clusters automatically do not seem to provide the same conclusions we obtained, the authors, regarding the relevant research topics that can be grouped based on their similar purposes. From our perspective, the clusters (C) could be more adequately defined and ranked as follows:

C1. Empirical research on the practical implementation of sustainability matters in accounting education, including the analysis of students' attitudes, perceptions, intentions and motivations to learn sustainability matters (Agustina et al., 2023; Albuquerque et al., 2023; Boulianne et al., 2018; Castilla-Polo et al., 2020; Cho et al., 2020; Coulson & Thomson, 2006; Ebaïd, 2022; Eugenio et al., 2022; Fernández Chulián, 2011; Frizon & Eugénio, 2022; García & Thomson, 2018; Grimm, 2021; Gusc & Heijes, 2018; Gusc & van Veen-Dirks, 2017; Hahn & Reimsbach, 2014; Holland, 2004; Hughes & Troy, 2016; Hutaibat, 2019; Journeault et al., 2019; Larrán et al., 2018; Lee et al., 2017; Saravanamuthu, 2015; Sharma & Stewart, 2022; Shriberg, 2000; Stewart, 2024; Tran & Herzig, 2023; Wyness & Dalton, 2018; Yüksel, 2020). It is relevant to stress that the studies within this group are predominant, also having a literature review on research in sustainability in accounting courses (Frizon & Eugénio, 2022);

C2. Essays on sustainability matters in accounting education, including propositions of theoretical and/or methodological approaches through the analysis of the needs, costs and benefits of their introduction (Brown & Dillard, 2019; Castilla-Polo et al., 2022; del Baldo & Baldarelli, 2017; Gray, 2013; Kelly & Bather, 2009; Lange & Kerr, 2013; McPhail, 2013; Sheehan et al., 2024; Sisaye, 2011, 2012; Szczepankiewicz et al., 2021);

C3. Implementation and assessment of sustainability in HEIs (Ayuso et al., 2022; Cavicchi & Vagnoni, 2018; Dağlıoğlu, 2021; David et al., 2010; Lehmann et al., 2009; Mahdi & Abass, 2022; Meseguer-Sánchez et al., 2020; Murphy, 2023; Schaffhauser-Linzatti & Ossmann, 2018). It is also possible to find a literature review on this research topic (Meseguer-Sánchez et al., 2020);

C4. Other stakeholders' perceptions of the implementation of sustainability in the accounting curricula and/or the effects of implementing and assessing sustainability matters in general to them in other areas such as businesses (Al-Hazaima et al., 2021; Barkusky & Lorne, 2006; Lee & Perdana, 2023; Mader et al., 2013; Maiga, 2020; Piza et al., 2018; Roach & Slater, 2016; Schaltegger, 2021).

Regarding the territorial scope of the identified articles (**RQ5.1**), and consistent with the previous findings for countries of authors' affiliations (**RQ4**), Anglo-Saxon countries were prevalent (with 19 papers), with the US as the most representative one (with 8 papers), followed by Australia, Scotland and the UK (all with 2 papers each). Countries from the European Union were the second largest group included in the papers' research samples (with 16 papers), where Spain was predominant, with 6 papers, followed by Italy, Portugal and the Netherlands (all with 2 papers each). Finally, outside of those groups, Jordan, and Turkey (both with 2 papers) appeared as the most representative. A single paper studied a wide range of countries (Australia, the UK, the European mainland, North America and South Africa), namely the one by Mader et al. (2013), which is the highest cited paper in this study research sample, as previously indicated.

By clusters, studies including Anglo-Saxon countries were the most representative in **C1**, with 13 papers (e.g. Garcia & Thomson, 2018; Grimm, 2021; Gusc & Heijes, 2018; Journeault et al., 2019; Lee et al., 2017; Sharma & Stewart, 2022; Stewart, 2024; Wyness & Dalton, 2018), of which 7 included the US (e.g. Garcia & Thomson, 2018; Grimm, 2021; Gusc & Heijes, 2018; Lee et al., 2017; Stewart, 2024).

Following, European Union countries were represented by 7 papers in **C1** (e.g. Albuquerque et al., 2023; Boulianne et al., 2018; Castilla-Polo et al., 2020; Larrán et al., 2018; Tran & Herzig, 2023), of which 3 are about Spain (Castilla-Polo et al., 2020; Fernández Chulián, 2011; Larrán et al., 2018).

Conversely, the European Union Countries prevailed in **C2**, with 4 papers including Italy, Poland, Spain and The Netherlands (del Baldo & Baldarelli, 2017; Szczepankiewicz et al., 2021; Kelly & Bather, 2009; Sheehan et al., 2024, respectively).

These countries were also the most representative in **C3**, with 4 papers placed in Denmark, Italy, Portugal and Spain (Lehmann et al., 2009; Cavicchi & Vagnoni, 2018; David et al., 2010; Ayuso et al., 2022, respectively).

Finally, Anglo-Saxon countries were prevalent in **C4**, with 2 papers regarding Scotland, and the US (Maiga, 2020; Roach & Slater, 2016, respectively), which also includes the one with a wider scope of analysis by Mader et al. (2013) above mentioned.

Following, the main methodological lines for developing their research (**RQ5.2**) were case studies (with 19 papers, 2 of them combined with interviews), essays (with 14 papers), and surveys (with 12 papers). The remaining papers used archival research, experimental and quasi-experimental methods, as well as literature review.

By clusters, the case studies as a methodological approach prevailed in **C1** with 12 papers (e.g. Cho et al., 2020; Grimm, 2021; Gusc & van Veen-Dirks, 2017; Hughes & Troy, 2016; Hutaibat, 2019; Journeault et al., 2019; Saravanamuthu, 2015; Tran & Herzig, 2023; Wyness & Dalton, 2018).

Following, surveys also emerged in **C1** with 9 papers (e.g. Agustina et al., 2023; Albuquerque et al., 2023; Boulianne et al., 2018; Castilla-Polo et al., 2020; Ebaid, 2022; Eugenio et al., 2022; Gusc & Heijes, 2018; Larrán et al., 2018).

The papers in **C2** were naturally based on the essays.

Following, the predominant methods in **C3** were also case studies, with 5 papers (Cavicchi & Vagnoni, 2018; Dağlıoğlu, 2021; David et al., 2010; Lehmann et al., 2009; Murphy, 2023).

Finally, the papers in **C4** were mostly based on essays with 3 papers (Barkusky & Lorne, 2006; Mader et al., 2013; Schaltegger, 2021), followed by case studies with 2 papers (Maiga, 2020; Piza et al., 2018).

In what concerns the components of ESG that have received the most focus within the publications (**RQ5.3**), social and human rights were the most representative, with 13 papers, as follows:

- 5 papers in **C1** (Agustina et al., 2023; Castilla-Polo et al., 2020; Gusc & Heijes, 2018; Holland, 2004; Larrán et al., 2018);
- 3 papers in both **C2** (Kelly & Bather, 2009; McPhail, 2013; Sisaye, 2011) and **C4** (Barkusky & Lorne, 2006; Lee & Perdana, 2023; Roach & Slater, 2016); and
- 2 papers in **C3** (David et al., 2010; Meseguer-Sánchez et al., 2020).

Following, the environmental issues also emerged with 7 papers, as follows:

- 3 papers in **C1** (Eugenio et al., 2022; Fernández Chulián, 2011; Lee et al., 2017);
- 2 papers in **C2** (Lange & Kerr, 2013; Szczepankiewicz et al., 2021); and
- 1 paper in both **C3** (Dağlıoğlu, 2021) and **C4** (Piza et al., 2018).

The remaining 36 papers covered sustainability matters overall, as follows:

- 20 papers in **C1** (e.g. Albuquerque et al., 2023; Boulianne et al., 2018; Cho et al., 2020; Coulson & Thomson, 2006; Ebaid, 2022; Frizon & Eugénio, 2022; Garcia & Thomson, 2018; Grimm, 2021; Hutaibat, 2019; Journeault et al., 2019; Sharma & Stewart, 2022; Stewart, 2024; Tran & Herzig, 2023; Wyness & Dalton, 2018; Yüksel, 2020);
- 6 papers in both **C2** (Brown & Dillard, 2019; Castilla-Polo et al., 2022; del Baldo & Baldarelli, 2017; Gray, 2013; Sheehan et al., 2024; Sisaye, 2012) and **C3** (Ayuso et al., 2022; Cavicchi & Vagnoni, 2018; Lehmann et al., 2009; Mahdi & Abass, 2022; Murphy, 2023; Schaffhauser-Linzatti & Ossmann, 2018); and
- 4 papers in **C4** (Al-Hazaima et al., 2021; Mader et al., 2013; Maiga, 2020; Schaltegger, 2021).

Furthermore, and by clusters, **C4** was the only one where a higher balance was found between studies on sustainability, in general, and social and human rights, in particular.

Regarding the main proposed teaching methodologies (**RQ5.4**), which is naturally applicable to the clusters **C1** and **C2** only, several authors proposed problem-based learning, through case studies, with active and disrupted methodologies to foster critical thinking (e.g. Cho et al., 2020; Garcia & Thomson, 2018; Grimm, 2021; Gusc & van Veen-Dirks, 2017; Hutaibat, 2019; Journeault et al., 2019; Tran & Herzig, 2023; Wyness & Dalton, 2018). They also addressed the need for interdisciplinary and multidisciplinary approaches, namely to teach social and environmental sustainability (e.g. Holland, 2004; Hughes & Troy, 2016). It is worth mentioning that a single study in **C4** also highlighted the need for teacher training in ESD (Piza et al., 2018).

About the main courses and levels of education (**RQ5.5**), the accounting (with 19 papers), and related areas (such as Accounting and Auditing, Business and Accounting, Accounting, Business and Law, and Economics, Management and Accounting, with one paper each) were the most studied by the papers assessed in this research. There were also papers in Business, Management, and Business and Technology courses. The most represented educational level was the bachelor's degree (with 20 papers), followed by the Master's degree (with 3 papers).

By clusters, the **C1** is naturally the one that included more papers that studied courses and levels of education with 23 papers out of 28 (e.g. Agustina et al., 2023; Albuquerque et al., 2023; Castilla-Polo et al., 2020; Ebaid, 2022; Eugenio et al., 2022; Garcia & Thomson, 2018; Grimm, 2021; Gusc & Heijes, 2018; Gusc & van Veen-Dirks, 2017; Hutaibat, 2019; Journeault et al., 2019; Larrán et al., 2018; Sharma & Stewart, 2022; Stewart, 2024; Tran & Herzig, 2023; Wyness & Dalton, 2018; Yüksel, 2020).

Only 2 papers proposed teaching methodologies in **C2** by referencing courses and educational levels, namely Management in a bachelor's and master's degree jointly (Gray, 2013), and Economics, Management and Accounting in a master's degree (Sheehan et al., 2024).

The remaining papers were found in **C4**, namely Accounting (Al-Hazaima et al., 2021; Maiga, 2020), and Accounting and Management (Piza et al., 2018), both from bachelor's degrees.

Out of the 56 papers assessed, only 15 identified the social sciences theories as theoretical background (**RQ5.6**). The prevalent ones are the Stakeholder theory with 2 papers, one in **C3** (Ayuso et al., 2022) and one in **C4** (Al-Hazaima et al., 2021), and the Stakeholder and Stockholder theories with 2 papers, both in **C1** (Gusc & Heijes, 2018; Larrán et al., 2018).

Other theories were also used, however. In papers from **C1**, it was found the following theories: Ajzen's Theory of Planned Behaviour (Lee et al., 2017), the Legitimacy Theory and Institutional Theory (Sharma & Stewart, 2022), the Self-Determination Theory (Albuquerque et al., 2023), and the Theory of Planned Behaviour (Eugenio et al., 2022).

Next, the Agonistic Pluralism (Brown & Dillard, 2019), the Critical Social Theory (Lange & Kerr, 2013) the Shareholder Value Maximisation (Castilla-Polo et al., 2022), and the Functional-Institutional Theory and the Consequential-conflictual Theory (Sisaye, 2011) were found from papers in **C2**. In **C3**, the Sociology of Worth (Murphy, 2023) was used as the supporting theory. Lastly, Lancaster's Theory on Demand (Barkusky & Lorne, 2006), and the Upper Echelons Theory (Roach & Slater, 2016) were some of the theoretical backgrounds assessed in papers from **C4**.

To summarise the main conclusions reached by the studies (**RQ6**), the authors stressed that business and accounting students expressed a greater concern for the social and environmental dimensions of corporate social responsibility and sustainability. Students' concern for sustainability increases with the emphasis their higher education institution places on this issue. Notwithstanding, higher education's annual reports focus mainly on economic information, particularly accounting, while often less emphasising or even neglecting social and environmental aspects.

Furthermore, accounting disciplines fail to recognise the socially constructed nature of accounting reports and their valuation role. Effective sustainability management requires a holistic, systemic, and integrative approach. Consequently, research highlights the importance of integrating sustainability education into the accounting curriculum rather than in standalone courses. Furthermore, sustainability must be the fundamental underlying and permeating both the entire course and its teaching methods, enhancing a general, business and accounting awareness of sustainability.

Finally, most students showed changes in their understanding of the accounting objective, gaining a broader perspective on organisational management and proposing alternative business scenarios. They attributed this change not only to increased knowledge but also to the challenge of rethinking and questioning previously held beliefs from other curricular units.

4. Discussion and conclusions

Using a comprehensive viewpoint, this paper attempts to provide a systematic literature review on sustainability issues in education, namely related to accounting-related courses given the challenges resulting from the sustainability reporting and considering the relevant role that accounting should have in the sustainable development (Carnegie et al., 2021).

The findings indicate an increase in publications on sustainability, in line with the growing relevance of such issues worldwide. In recent years, studies with practical applications and a more diverse set of methodologies have increased instead of the initial focus on theoretical essays and analyses.

Nevertheless, there are still some gaps that can serve as avenues for future research, especially if the geographical scope of the study is expanded, as studies still focus mainly on more developed countries (countries on the Anglo-Saxon axis and Europeans). As a result, studies covering Latin American, Asian and, especially, African countries still have plenty of room to explore their realities.

Furthermore, multi-country analyses, still incipient, also prove useful, as they allow for the inclusion of other analysis factors, including sociocultural, political and economic issues, among others. There has been relatively little exploration of these issues in studies, with a lot of attention still paid to classic demographics of respondents, such as gender, age and employment status. There is also a long way to go in developing studies that relate the learning of these subjects to intrinsic motivations for learning, learning styles or, even, specific characteristics of students about their concerns with sustainability-related subjects.

The most recent frameworks in the sustainability area, notably those issued by the IFRS Foundation (internationally) and EFRAG (in the European Union context), or those expected to be applied in the future by such entities, also constitute a subject that can be researched in new empirical studies in education related to the accounting sciences. Specific research covering social and human rights as well as environmental issues seems to be globally aligned with the concerns of international organisations that have produced frameworks on the matter, given that these ESG components have been strengthened (e.g. CSRD). However, it is also important to notice the absence of studies that include issues specifically related to the governance dimension of ESG since it is usually neglected in studies that cover educational matters.

Studies in this area may focus on students' ability to adequately apply those standards or even understand the concepts that underlie them, especially in matters that may require the exercise of professional judgement. In methodological terms, although it can be already observed some studies that use it, the use of semi-experimental and experimental methodologies can be possibly expanded, which allows for a more adequate and effective capture of the proposed teaching and evaluation methodologies, in comparison to the survey, notably.

Additionally, a relative absence of theoretical background was identified in the studies analysed, a gap that can be eliminated with continued studies within the scope of the topic. Finally, studies that combine the theme of sustainability with emerging technologies, particularly those based on artificial intelligence, could greatly enrich the scientific literature in this field.

The findings from this paper can be useful to researchers since it provides a comprehensive overview of previous literature on sustainability and education, adding several avenues for future investigations. It also contributes to academia, in general, by providing the overall content of a significant set of research on this topic that can be useful to implement educational methodologies in this field or to reassess those that have been already adopted. This also includes the benefits of the findings from research on the implementation and measurement of sustainability matters that have been applied by the HEIs, which can be used by policymakers when applying or reassessing them.

Nonetheless, it should be noted that this research also has the limitations of systematic literature reviews that should not be avoided, which mainly include the methods defined to select the papers to review and the inherent subjectivity of qualitative analysis. Besides, researchers should be aware of the scope of the sustainability definition used to gather the papers for the proposed analysis, as well as the different perspectives regarding this concept that underly those investigations, which were not more in-depth assessed in this research. This analysis emerges, consequently, as an avenue for future researchers in this field, which may include the analysis of the specific scope and purposes of learning sustainability matters in accounting courses as well as how this concept can be possibly understood differently or through divergent levels of relevance by several stakeholders, such as students, professors, HEIs and society in general.

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