Bibliometric Analysis of Academic Research in Education for Sustainable Development in the Field of Tourism

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ABSTRACT

An increase is occurring year on year, especially from 2019, in publications related to education for sustainability development (ESD) in the field of tourism. The objective of this paper is to analyse how the concept of sustainability is present in education in this area. To this aim, this article carries out a bibliographic review of the existing scientific literature on the presence of sustainability in tourism training. As an empirical part of the work, a bibliometric review of the works published in the Scopus database on sustainability in tourism education is proposed. Through evaluation and relational methods, it is intended to know the reality of this trend in tourism education. The analysis carried out shows that publications related to ESD in the field of tourism started focusing on the environment to shift on economic and social issues with the passage of time, and that there is greater attention to EDS on university education.

KEYWORDS

Academic Research, Database, Development, Education, Scopus, Sustainability, Tourism

INTRODUCTION

Growing concern about environmental issues and the spread of the concept sustainability is helping to put pressure on governments, businesses, groups and individuals to find solutions that move towards a more sustainable relationship with the planet. A key element in achieving sustainability goals is education. Thus, in response to environmental problems, the educative sector, especially at university level, has integrated in the curricula sustainability contents to support the development of knowledge. This trend is particularly necessary in tourism and hotel education because the tourism and hotel industry is responsible for a significant environmental impact (Styles et al., 2015).

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Although there are multiple definitions of sustainability, as well as ways of understanding it and, despite criticism from different cultures of the Western concept of sustainability, increased awareness of sustainability can be linked to several United Nations global conferences, starting with the 1972 United Nations Conference on the Human Environment, which established the United Nations Environment Programme and created a set of 26 principles to address sustainability. Principle 19 described the need for environmental education both within and outside formal education to “broaden the basis of enlightened opinion and responsible behaviour on the part of individuals, businesses and communities” (UNEP, 1972).

Education in sustainability has received increased attention in higher education (Maragakis et al., 2016; Westerman et al., 2016), combining several new materials with current sustainability assessments in the classroom to inspire critical thinking among students that has not yet been fully explored (Thomas, 2009). In addition, the objectives of education include training people who can work in enterprises that offer economically profitable, socially responsible and environmentally viable services. Therefore, schools, and especially universities, should design curricula that develop students’ skills in critical thinking and anticipate the implications of their actions, along with a sense of ethics and empathy.

According to Cupitt and Smith (2012, p. 5) ESD should provide students with “the ability to solve problems through the integration of knowledge, leading to a general understanding or a vision of the world with long-term visions and an integration of values”. However, the reality is somewhat removed from this intention, graduating many students without such skills. Carp (2013), Blewitt (2013) and Sterling (2013) also point out parallels between the goals for education in general and ESD and suggest that current approaches to education do not achieve these goals. A potential reason for this in the case of tourism could be that curriculum design is based on weak conceptualization of sustainability (e.g., triple result) as opposed to sound conceptualization of sustainability (Ferreira et al., 2017).

At the present time, the body of knowledge about what constitutes sustainability in education is attracting interest. However, the advancement of education for sustainability in teaching and learning practices seems frustrated in many fields of study, including tourism (Boyle, 2017). Research on what is included in tourism, hospitality and events programmes in higher education consistently reports that, while sustainability as a subject for tourism education is much discussed, it is not well integrated into existing programs (Fidgeon, 2010). This paper aims to deepen this topic, therefore, the objective of this paper is to analyse how the concept of sustainability is present in education in the field of tourism, especially at university level. To this end this article carries out a bibliographic review of the existing scientific literature on the presence of sustainability in tourism training, field chosen for this paper as one of the industries where sustainability is most necessary today. As an empirical part of the work, a bibliometric review of the works published in the Scopus database on sustainability in tourism education is proposed. Through evaluation and relational methods, it is intended to know the reality of this trend in tourism training.

THEORETICAL REVIEW

Analysis and Evolution of Education for Sustainable Development (ESD)

The evolution of ESD has been parallel to the evolution of sustainable development, conditioned by the growing concern for sustainability. This development could not be analysed without focusing on the multitude of international conferences, forums, reports, etc. most of them sponsored by the United Nations, that have tried to solve environmental, social and economic problems with less or more success. Since the United Nations Conference on the Human Environment (also known as the Stockholm Conference) on 1972 to the December 2020 COVID-19 recovery, focus of UN General Assembly special session, efforts have been made to address these problems, but the
pandemic has shown that much remains to be done. From the evidence of non-achievement of the millennium development goals to the decline of the global economy, and a setback in achieving the SDGs. (United Nations, 2020), there has been a lack of success of global agreements on sustainability (Hales & Jennings, 2017).

What is now known as ESD began as EE (Environmental Education), with the aim of students learning the need to protect the environment. From the 1987 Brundtland Report, titled ‘Our Common Future’, there is a shift toward sustainable development in education (Kopnina, 2020), and a gradual introduction of the social and economic dimension, beyond the environmental dimension, both in the conceptualisation of the SD and ESD.

The higher education has played an important role in support of sustainable development since the early 1990s (Mallow et al., 2020) in conjunction with the World Conference on Education for All where about 1,500 delegates from 155 countries and representatives of some 150 governmental, non-governmental and intergovernmental organizations adopted the World Declaration on Education for All that begins by stating that “Every person child, youth and adult shall be able to benefit from educational opportunities designed to meet their basic learning needs” (United Nations, 1990). The Agenda 21 (1992) moved ESD closer towards social and economic issues (Sinakou et al., 2019) continuing the trend of focusing on the three dimensions of sustainability and not just on the environment. In 2000, The World Education Forum expected to be a boost drive for education for all and resolve the inequalities in educational provision (United Nations, 2000), trying to meet the education needs for all by 2015 by redefying strategies and setting goals. United Nations declared on 2005 the Decade of ESD, with the objective of mobilize the educational resources to create a more sustainable future (UNESCO, 2005), is when social and economic aspects of sustainability are reaffirmed jointly with the Johannesburg Declaration. In 2014, at the end of the Decade of ESD the UNESCO World Conference on ESD recognized ESD as a key element of quality education and a crucial enabler for sustainable development, launched the Global Action Programme (GAP) from 2015 to 2019 to set the future of ESD (UNESCO, 2015). In 2015, the 2030 Agenda was approved by The United Nations recognizing the important of education in achieving their targets, education was explicitly recognized in the 2030 Agenda the Sustainable Development Goal (SDG) 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. Is possible to find also references to education in most of the SDGs (United Nations, 2015). On 2019 UNESCO adopted a new global framework, entitled Education for Sustainable Development: Towards achieving the SDGs (ESD for 2030), for the implementation of the ESD beyond the GAP, covering the period 2020-2030. The lasts UNESCO World Conference on Education for Sustainable Development was scheduled to be held in 2020 but due to the Covid-19 pandemic was delayed to 2021 being held by telematics.

Despite ‘there is international consensus that achieving sustainable development is essentially a process of learning” (UNESCO, 2002, p. 7) and that ESD is a key to enable of all SDG and the capacity of empower learners with knowledge, skills, values and attitudes (UNESCO, 2015), these achievements are tarnished by criticism on several grounds of the very concept of sustainability. This criticism is due to be a transversal concept that allows multiple interpretations and planning, depending on different disciplines; social and cultural contexts; ethical aspects, etc (Sinakou et al., 2019). Sustainability means “many different things to many different people” (Hatipoglu et al., 2014), and the Western interpretation of SD has been considered for some people highly anthropocentric, hegemonic, failed on recognition of ecological justice and nonhumans’ rights (Kopnina, 2020b); even an ‘oxymoron’ (Sinakou et al., 2019). The principal contradiction is based a sustainable development on economic growth, when economic growth is the root of environmental unsustainability (Kopnina, 2020). Degrowth in both population and consumption is essential (Hales & Jennings, 2017), but none of United Nations documents mention a degrowth. Alternatives to neo-liberal and neo-colonial growth models (Everingham & Chassagne, 2020) include, in addition to degrowth, the recovery of traditional knowledge (Unceta, 2014); intellectual reflection (Gudynas & Acosta, 2011); self-management; the use of local resources (Unceta, 2014); social justice; equality; democracy; circular economy supporting
women’s (reproductive) rights and family planning (Kopnina, 2020); recognition of nonhuman rights and ecological justice in conservation and education (Kopnina, 2020b). On education, an alternative to a uniform “education for all” can be the “ecocentric education”, the “ecopedagy” or the Indigenous learning that focuses on ecological values (Kopnina, 2020), and offers more than the unreflective quest for economic growth or the optimism of denial espoused by the SDGs (Kopnina, 2020b).

Although there has been considerable progress in the incorporation SD into the curricula of higher education institutions (HEIs) (Lozano et al., 2019), there are two challenges that universities face (Torres, 2021): to incorporate the SDGs into the training process and to provide people with professional and personal skills and capabilities to ensure that future leaders, decision-makers, teachers, innovators, entrepreneurs, and citizens have knowledge (SDSN, 2017) to face the challenges posed by the achievement of a sustainable tackling the world’s complex problems (Trad, 2019). Incorporate the SDGs into the training process is not an easy task, a combination of different pedagogical approaches is needed to develop SD competence (Lozano et al., 2019), and is difficult for teachers to integrate the three dimensions (environment, economy and social). For these reasons, neither teachers nor students hold a holistic view of the SD concept (Sinakou et al., 2019) that would allow to have their own interpretation of the SD concept in different scenarios and cultures, and to be critical and/or innovative to implement the sustainability in their future professions. Teachers experience some barriers, as there are difficulties in integrating sustainability into an already overcrowded curriculum, lack of time, knowledge, skills, resources (Anyolo et al., 2018), little support (Sinakou et al., 2019) or a lack of innovative approaches by teachers who train teachers (Hales & Jennings, 2017).

Sustainability in Tourism Education

The concept of sustainability has been extended to different areas, including tourism. One of the most popular definition of Sustainable Tourism is the definition made by Carbone in the book Making Tourism More Sustainable (UNWTO, 2005, p.24), according to this definition, “Sustainable Tourism is Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities”. This definition is complemented by the twelve aims that address economic, social and environmental impacts in a sustainable tourism plan, each of one equally important (UNWTO, 2005): Economic Viability; Local Prosperity; Employment Quality; Social Equity; Visitor Fulfilment; Local Control; Community Wellbeing; Cultural Richness; Physical Integrity; Biological Diversity; Resource Efficiency; and Environmental Purity. These twelve aims made the definition global in scope, making it possible to apply sustainable management to all forms of tourism and to all destinations, including mass tourism, avoiding making sustainability a characteristic and exclusive of certain types of tourism and/or destinations. In the area of Tourism not only the 2030 Agenda, but also the International Year of Sustainable Tourism for Development in 2017 (UNWTO, 2017), have in recent years driven the development of Sustainable Tourism. In Figure 1 it is possible to observe a timeline with the main milestones of SD, EDS and sustainable tourism from 70’s until nowadays. In the 2030 Agenda (United Nations, 2015), there are explicit references to sustainable tourism in the following goals:

- Goal 8.9: By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products.
- Goal 12.b: Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products.
- Goal 14.7: By 2030, increase the economic benefits to small island developing states and least developed countries from the sustainable use of marine resources, including through the sustainable management of fisheries, aquaculture and tourism.

Tourism is one of the largest industries in the world, and responsible for a significant environmental impact (Styles et al., 2015) and, although industry could use sustainability
to legitimize current unsustainable practices (Baum et al., 2016), tourism has the potential of contributing to local development while protecting natural environment and preserving cultural heritage at all territorial levels (Akinci et al., 2018; Hatipoglu et al., 2014). Therefore, it is necessary to focus on sustainability education that the future tourism workforce is being received at all educative levels, because is this workforce that would play an effective role in the implementation of sustainable tourism policies (Akinci et al., 2018), and they would have to address the complexities of sustainability within the tourism industry (Baum et al., 2016). Is possible to define sustainability education in tourism as “any level of education or training related to environmental, socio-cultural, and economic issues in the conduct of tourism enterprise and tourism development” (Hatipoglu et al., 2014, p.3).
Many tourism programs do not have a critical dimension (Hales & Jennings, 2017) therefore, as in the EDS in general, it is necessary create holistic and transformational skills in this topic (Akinci et al., 2018) and the use of active and experiential learning for developing students’ critical thinking skills to understand the complexity of sustainable tourism (Akinci et al., 2018; Baum et al., 2016; Lund-Durlacher, 2015). The use of social media, group discussions, problem-based learning, service learning, case studies and collaborative learning; watching films or reading newspapers are some recommendations to successfully include sustainability in tourism studies, as well as cooperation among tourism students, tourism sector managers and tourism educators (Akinci et al., 2018). However, it is not just a matter of including sustainability content in curricula (Lund-Durlacher, 2015), or of teachers being able to correctly convey such content. Educational organizations also need to have a commitment to the effective implementation of sustainability, through the research, the engagement with the local communities, with initiatives to make campuses more sustainable (Mallow et al., 2020) and by stimulating action-taking and sustainable behavior among their students, faculty and staff (Lund-Durlacher, 2015).

During the last years, there has been a growing body of literature about SD and EDS. The objective of this paper is to analyse through a bibliometric analysis of academic research how the concept of sustainability is present in education in the field of tourism, especially at university level.

MATERIALS AND METHODS

For this purpose, a comprehensive bibliometric analysis is carried out that includes two main techniques, evaluative methods, and relational methods (Benckendorff & Zehrer, 2013; Koseoglu et al., 2016). Thus, the bibliographic information of the articles collected was organized, classified, and summarized in an Excel spreadsheet. Then, word frequency analysis and analysis of key topics were applied to explore the contents and relationships between the research topic and its associated topics and methods. Word frequency analysis and content analysis method were used to quantify qualitative data (Schreier, 2012).

The data collection procedures were carried out in June 2021 and consisted of a search for papers on “sustainability in tourism education”, written in English and published in the Scopus database until June 2021. The Scopus database was chosen as a data source because it was one with the largest set of citation data and high-quality abstracts of peer-reviewed literature on the web (Bosman et al., 2006). To filter the studies on the subject, the search was limited to works that contain “sustainability + tourism + education” (STE) within their title, abstract and keywords. A total of 526 jobs are thus obtained. This sample is used for quantitative analysis. For the content analysis it is decided to analyse the most recent works, published in 2021, knowing the most current trends in this field. In this case the sample amounts to 45 works, being one of the years with more publications in this field (considering that it has not finished the year). Of those 45, after discarding those that do not focus exclusively on ETS, the sample is reduced to 17. In addition, a correlation coefficient analysis through the Pearson $\rho$ statistics was carried out with the most frequently researched topics in this sample (n=17), using keywords, titles and abstracts and topic publication patterns. The Pearson correlation coefficient test measures the statistical relationship, or association, between those continuous variables. It is single reliability measure indicator, which is determined by the following expression (the relationship between covariance and product standard deviations of each variable):

$$\rho = \frac{1_{xy}}{1_x 1_y}$$

Coefficient values can range from +1 to -1, where +1 indicates a perfect positive relationship, -1 indicates a perfect negative relationship, and a 0 indicates no relationship exists.
RESULTs

Productivity and Impact Metrics

The data analysed show a growing trend in the work on STE especially from 2019. Only in the last 3 years (2019-2021) 35.7% of research in this field been published. And it should be noted that the year 2021 has only been analysed until June. The maximum value so far has been reached in the year 2020, with a total of 100 works, being the average of the previous decade of 34 annual publications (Table 1).

In terms of journal productivity, as shown in Figure 2, Sustainability clearly has the highest number of publications (44), followed by Journal Sustainable Tourism (28), Journal of Teaching in

Table 1. Academic publications of STE

<table>
<thead>
<tr>
<th>Year</th>
<th>No. Publications</th>
</tr>
</thead>
<tbody>
<tr>
<td>2021</td>
<td>45</td>
</tr>
<tr>
<td>2020</td>
<td>100</td>
</tr>
<tr>
<td>2019</td>
<td>43</td>
</tr>
<tr>
<td>2018</td>
<td>39</td>
</tr>
<tr>
<td>2017</td>
<td>33</td>
</tr>
<tr>
<td>2016</td>
<td>36</td>
</tr>
<tr>
<td>2015</td>
<td>36</td>
</tr>
<tr>
<td>2014</td>
<td>29</td>
</tr>
<tr>
<td>2013</td>
<td>22</td>
</tr>
<tr>
<td>2012</td>
<td>32</td>
</tr>
<tr>
<td>2001-2011</td>
<td>103</td>
</tr>
<tr>
<td>1992-2000</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>526</strong></td>
</tr>
</tbody>
</table>

Figure 2. The most publishing journals contributing to the area of STE (more than six articles published)

Source: Scopus (2021)
Travel and Tourism (15) and Journal of Coastal Research (14). Two other publications: Iop Conference Series Earth and Environmental Science, and Worldwide Hospitality and Tourism Themes, surpass 10 publications.

Regarding the thematic category of the journals in which most of the articles were published, “Social Sciences” leads the ranking with 301 articles, followed by “Business, Management and Accounting” (214 articles), and “Environmental Science” (213 articles). The remaining categories represent less than 60 items each. The results of publications on sustainability in tourism education by thematic category are summarized in Figure 3.

The articles were also analysed in terms of the geographic location of the research institutions to which their authors are associated. Figure 4 shows the main countries in terms of the number of articles published in STE. It is noteworthy that United States has the best publishing record, with 78 articles. The second most prolific country is Australia, which has contributed 66 articles during

Figure 3. Top subject categories of journals ordered by published articles on STE (more than 20 articles published)
Source: Scopus (2021)

Figure 4. The most prolific countries in the field of STE
Source: Own elaboration from Scopus (2021)
the period under review. Then Spain and United Kingdom with 37 jobs. With significantly lower production, Italy, China, Indonesia, Malaysia and Turkey, between 15 and 24 jobs.

Finally, the sample was analyzed in terms of the most prolific authors. To do this, not only the number of articles published by each author was considered, but also the number of citations received by each article and author, since it is a more accurate indicator of the impact factor of the authors and articles. As shown in Table 2, these two variables are not always directly proportional. For example, Seraphin, N. is the author who published most articles about STE, however, is the second with the lowest number of citations. Authors such as Higgins-Desbiolles, F. or Saayman were cited significantly more, with Higgins-Desbiolles, F. being the most influential author with 81 citations.

**Word Frequency Analysis**

The frequency of words was first analyzed through keyword counts, which were carried out in the 526 articles, resulting in a total of 4,270 words, with an average of 4.2 keywords per document. The sample of words from the 526 titles included 6,995 words. The sample of abstracts included 119,160 words. Articles, prepositions, and pronouns have been dispensed with for the analysis of these words. Table 3 summarizes the most common words in titles, abstracts, and keywords. As expected, “tourism”, “sustainability” and “education” top the ranking, followed by “development” and “management”.

**Key Theme Analysis**

To analyse the key themes over time, a temporal analysis of the abstracts of the 526 articles is carried out. There are 5 periods since the first publication in 1992:

- 1992-2000
- 2001-2005
- 2006-2010
- 2011-2015
- 2016-present (June 2021)

The first period, prior to the present century, only presents 8 published works. These early works, apart from one published in 1999, do not focus on the concept of sustainability applied to tourism.

**Table 2. Most prolific and influential authors on STE**

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Author</th>
<th>Absolute Frequency</th>
<th>%</th>
<th>Total Citations</th>
<th>No. of First Authorship Papers</th>
<th>Publication Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seraphin, H.</td>
<td>5</td>
<td>0.09</td>
<td>8</td>
<td>5</td>
<td>2020-2021</td>
</tr>
<tr>
<td>2</td>
<td>Hales, R.</td>
<td>4</td>
<td>0.08</td>
<td>41</td>
<td>1</td>
<td>2015, 2017, 2019-2020</td>
</tr>
<tr>
<td>3</td>
<td>Deale, C.S.</td>
<td>3</td>
<td>0.06</td>
<td>16</td>
<td>2</td>
<td>2010, 2015, 2020</td>
</tr>
<tr>
<td>4</td>
<td>Gretzel, U.</td>
<td>3</td>
<td>0.06</td>
<td>52</td>
<td>1</td>
<td>2011, 2014, 2017</td>
</tr>
<tr>
<td>5</td>
<td>Higgins-Desbiolles, F.</td>
<td>3</td>
<td>0.06</td>
<td>81</td>
<td>1</td>
<td>2015, 2019</td>
</tr>
<tr>
<td>6</td>
<td>Jennings, G.</td>
<td>3</td>
<td>0.06</td>
<td>44</td>
<td>2</td>
<td>2010, 2015, 2017</td>
</tr>
<tr>
<td>7</td>
<td>Mullins, P.M.</td>
<td>3</td>
<td>0.06</td>
<td>24</td>
<td>3</td>
<td>2014, 2018</td>
</tr>
<tr>
<td>8</td>
<td>Saayman, M.</td>
<td>3</td>
<td>0.06</td>
<td>54</td>
<td>0</td>
<td>2013, 2014, 2017</td>
</tr>
<tr>
<td>9</td>
<td>Skanavis, C.</td>
<td>3</td>
<td>0.06</td>
<td>30</td>
<td>1</td>
<td>2010, 2013, 2019</td>
</tr>
<tr>
<td>10</td>
<td>Wilson, E.</td>
<td>3</td>
<td>0.06</td>
<td>46</td>
<td>1</td>
<td>2013-2015</td>
</tr>
<tr>
<td>11</td>
<td>Yavarzadeh, M.</td>
<td>3</td>
<td>0.06</td>
<td>7</td>
<td>0</td>
<td>2012</td>
</tr>
</tbody>
</table>
education, but on sustainability in the management of tourism processes or in rural planning. The most common terms in these early investigations are tourism, management, sustainability, and development. The period 2001-2005, in which research almost tripled compared to the previous period, 22 works, does introduce the terms learning and training as part of the research linked to sustainability. In addition, a specific article on “British postgraduate courses in tourism” was published in 2001. Most of the work is still linked to sustainable tourism, ecotourism, and rural environments. The most prominent terms in this period continue to be tourism, sustainability, and development, to which are added education, environmental, ecotourism or community. The period 2006-2010, with 51 papers (more than double the previous period), presents greater presence of studies on training, education or even knowledge (25%), but most continue to focus on aspects more related to the environment and management. The terms that stand out in this period are tourism, development, sustainability, education, environmental, management, ecotourism, and as novelties, forest, local or conservation. In the period 2011-2015, the number of jobs amounted to 149. While the number of publications is increasing, the number of STE specific papers is increasing too, although work on sustainability continues to appear in much more generic terms, with particular emphasis on management, the natural environment and ecotourism, emerging more current currents such as renewable energy or pollution. In this period the terms of the previous one are maintained, adding social and economic. Finally, the current period, 2016-present, the most prolific with 296 jobs, incorporates a greater number of jobs related to education. The main

<table>
<thead>
<tr>
<th>TOP 15 Words on Titles</th>
<th>N=6,995</th>
<th>TOP 20 Words on Abstracts</th>
<th>N=119,160</th>
<th>TOP 16 Keywords</th>
<th>N=4,270</th>
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<td>Rank</td>
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<td>Sustainable</td>
<td>131</td>
<td>1.87%</td>
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<td>Sustainability</td>
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<td>1.56%</td>
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<td>Education</td>
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<td>Education</td>
<td>90</td>
<td>1.29%</td>
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<td>Development</td>
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<td>Management</td>
<td>69</td>
<td>0.99%</td>
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<td>Sustainable</td>
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<td>Development</td>
<td>69</td>
<td>0.99%</td>
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<tr>
<td>6</td>
<td>Ecotourism</td>
<td>48</td>
<td>0.69%</td>
<td>7</td>
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<tr>
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<td>Study</td>
<td>47</td>
<td>0.67%</td>
<td>8</td>
<td>Management</td>
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<tr>
<td>7</td>
<td>Environmental</td>
<td>47</td>
<td>0.67%</td>
<td>9</td>
<td>Local</td>
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<td>Case</td>
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<tr>
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<td>0.39%</td>
<td>11</td>
<td>Ecotourism</td>
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<tr>
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<td>Role</td>
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<td>Heritage</td>
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<td>Community</td>
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<td>Paper</td>
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<td>Rural</td>
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<td>0.30%</td>
<td>15</td>
<td>Areas</td>
</tr>
<tr>
<td>13</td>
<td>Industry</td>
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<td>0.30%</td>
<td>16</td>
<td>Students</td>
</tr>
<tr>
<td>13</td>
<td>Learning</td>
<td>21</td>
<td>0.30%</td>
<td>17</td>
<td>Analysis</td>
</tr>
<tr>
<td>14</td>
<td>Local</td>
<td>20</td>
<td>0.29%</td>
<td>18</td>
<td>Activities</td>
</tr>
<tr>
<td>15</td>
<td>Students</td>
<td>19</td>
<td>0.27%</td>
<td>19</td>
<td>Conservation</td>
</tr>
<tr>
<td>15</td>
<td>Hospitality</td>
<td>19</td>
<td>0.27%</td>
<td>20</td>
<td>Industry</td>
</tr>
</tbody>
</table>
terms of previous periods (tourism, sustainability, education, development, environmental, local, social, economic, etc.) are maintained and some specific terms related to education are added, such as higher education, responsible management education, ecotourism education, regional planning education or didactic education of tourist professionals (Figure 5).

Content Analysis

For the content analysis, as mentioned in the methodology of the work, the sample last year (2021) of 45 works will be used. From them, to focus on the main objective of this work, those that directly analyse sustainability in tourism education will be selected, reducing the sample to 17 publications (Table 4). The abstracts of the 17 works are analysed, looking for the key topics of study. It follows that the research on sustainability in tourism education focuses mostly on university education, which is therefore the level that arouses the greatest interest. The key themes are sustainable teaching techniques, the application of sustainability to the tourism sector, the perception of sustainability by tourism students, what is the state of sustainability in tourism education or how education itself can influence the sustainable behaviour of tourists.

Correlation Analysis

The next step was to correlate the main topics of the most recent articles with keywords, titles and abstracts to find possible correlations of words and find out which topics are searched together. Table 5 shows a highly significant correlation (p value=1) between the terms tourism and sustainability, students and economy, students and teaching, management and teaching or economic and teaching. High correlations are also found (with p value of 0.99) between tourism and students, tourism and management, tourism and economic, tourism and teaching, sustainable and students, sustainable and economic, sustainable and management. In general, the correlations are high between the analysed terms, being common the use of several of them in the same work.

Figure 5. Key theme timeline 2011-2021
### Table 4. Content analysis of the most recent STE publications (n=17)

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Theme</th>
</tr>
</thead>
</table>
| Higher education and the sustainable tourism pedagogy: Are tourism students ready to lead change in the post pandemic era? | Minguez C., Martínez-Hernández C., Yubero C. | • Sustainable tourism pedagogies  
• Students’ professional skills  
• Higher Education                                                                 |
| The implementation of the Principles for Responsible Management Education within tourism higher education institutions: A comparative analysis of European Union countries | Seraphin H., Yallop A.C., Smith S.M., Modica G. | • Tourism higher education  
• Responsible Management Education  
• Sustainability and the tourism industry                                                                 |
| Field environmental philosophy: A biocultural ethic approach to education and ecotourism for sustainability | Tauro A., Ojeda J., Caviness T., Moses K.P., Moreno-Terrazas R., Wright T., Zhu D., Poole A.K., Massardo F., Rozzi R. | • Novel educational methodology  
• Ecotourism practices  
• Tourism and experiential education  
• Education and conservation practices at different scales |
• Proposals of sustainable citizenship around the world  
• Communication on Twitter to educate the new eco-conscious audience |
| Country performance analysis of swiss tourism, leisure and hospitality management research | Cardoso L., Araújo A.F., Santos L.L., Schegg R., Breda Z., Costa C. | • Swiss higher education in tourism and hospitality  
• Prominent topics  
• Sustainability performance through strategic management of destinations |
| Tracing the trends in sustainability and social media research using topic modeling | Lee J.H., Wood J., Kim J. | • Social media  
• Sustainable consumer behavior  
• Sustainable community  
• Sustainable tourism  
• Education for sustainability |
| Survey of Japanese Medical Schools on Involvement of English-speaking Simulated Patients to Improve Students’ Patient Communication Skills | Ashida R., Otaki J. | • Healthcare environment  
• Medical education  
• Medical students’ patient communication skills |
| The impact of educational tourism on economic growth: A panel data analysis | Hussein S.H., Kasairi S., Ismail F. | • Impact of educational tourism on economic growth |
| Tracing the complexity-sustainability nexus in a small Mediterranean island: implications for hospitality and tourism education | Rezapouraghdam H., Akhshik A. | • Tourism and hospitality students discern sustainability |
| Participation in ecotourism education, gender and place of residence as determinants of attitudes towards sustainable tourism | Pasek M., Ratkowski W. | • Attitudes of students to realizing Sustainable Tourism  
• Women are characterized by more positive ecological attitudes than men |
| Sustainability in urban and regional planning education in Turkey | Karadeniz B., Barut M., Unlú Oztürk C., Tatlı P. | • The status of sustainability across Urban and Regional Planning (URP)  
• The contents of sustainability courses |
| Training in patrimonial and didactic education of tourist professionals. Pillars to contribute to sustainable development | Peñafiel R.G., Hernández Carretero A.M., Sánchez Martín J.M. | • The conceptions of students and graduates in Tourism and Primary Education about the need to control teaching strategies by professionals from tourist institutions |
| Pedagogical Sustainability Project Addressing Environmental Problems in Cabo Frio, RJ, Brazil | Pereira R.C.S., Pereira S.C., Dinis M.A.P., Gouveia L.B. | • To develop a sustainability and social responsibility project using pedagogical dynamics  
• Involving the discipline of Fundamentals of Tourism and Hospitality (FTH) of the Integrated High School Hosting Course (IHSHC). |
| Reforming tourism and archaeology education in palestine to meet industry expectations | Abahre J.S.H. | • Development of tourism and archaeology in higher education in Palestine |
| Learning through culinary tourism and developing a culinary tourism education strategy | Stone M.J., Migacz S., Wolf E. | • How destinations can get younger residents more interested in food and beverage  
• Education / formal education is one result |
| Educating sustainability through hackathons in the hospitality industry: a case study of Scandic hotels | Phi G.T., Waldesten T. | • Education for sustainability (Eis) in the hospitality sector  
• How the hospitality industry designs and executes sustainability hackathons within the context of Eis |
CONCLUSION

The terms sustainability, SD, and ESD, although used on multiple occasions, are transversal, constantly evolving, sometimes contradictory and challenged from multiple spheres and cultures. Its development has paralleled society’s growing interest in the environment, social justice, human rights, ecology, animal protection or democracy. There has been a growing body of literature addressing and discussing these terms, and specially in Tourism due to the great environmental impact it produces. This is reflected in the year-on-year increase in publications related to ESD and specifically ESD in the field of Tourism, especially from 2019. Is significant the fact that only in 2020 the same number of publications that contain “sustainability + tourism + education” (STE) within their title (100), abstract and keywords have been practically produced as in the decade from 2001 to 2011 (103).

The bibliometric analysis carried out shows that most of the publications related to sustainability, tourism and education and indexed in Scopus have been published in 4 journals. and that there are several authors who are focusing their publications on ESD in the field of tourism. The thematic category of the journals in which most of the articles were published is “Social Sciences, followed by “Business, Management and Accounting”, and “Environmental Science”. The country with most articles published in STE is United States, followed by Australia, Spain and United Kingdom. The most common words in titles, abstracts, and keywords, are “tourism”, “sustainability” and “education”, followed by “development” and “management”. The key theme varies during the different analysed periods, being environment and management the preferred key theme until 2006 when the theme education begins to stand out until 2016 when there are many articles whose key theme is education. The correlations are high between the analysed terms, being common the use of several of them in the same work.

Content analysis of the articles published in 2021, shows that the research on sustainability in tourism education focuses mostly on university education, and that some of the key themes are sustainable teaching techniques, the application of sustainability to the tourism sector or the perception of sustainability by tourism students.

All these results confirm some of the expected information on the basis of the theoretical review, as the develop of the terms SD and ESD, that starts focusing on the environment to shift on economic and social issues with the passage of time. As well as an increasing presence of education in publications following the adoption of the ESD decade in 2005. The content analysis confirms that

<table>
<thead>
<tr>
<th></th>
<th>Tourism</th>
<th>Sustainability</th>
<th>Education</th>
<th>Pedagogies</th>
<th>Students</th>
<th>Management</th>
<th>Ecotourism</th>
<th>Hospitality</th>
<th>Economic</th>
<th>Teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tourism</td>
<td>1.00</td>
<td>1.00</td>
<td>0.95</td>
<td>0.74</td>
<td>0.99</td>
<td>0.99</td>
<td>0.87</td>
<td>0.98</td>
<td>0.99</td>
<td>0.99</td>
</tr>
<tr>
<td>Sustainability</td>
<td>1.00</td>
<td>1.00</td>
<td>0.93</td>
<td>0.67</td>
<td>0.99</td>
<td>0.99</td>
<td>0.85</td>
<td>0.96</td>
<td>0.99</td>
<td>0.99</td>
</tr>
<tr>
<td>Education</td>
<td>0.95</td>
<td>0.93</td>
<td>1.00</td>
<td>0.80</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
<td>0.99</td>
<td>0.98</td>
<td>-1.00</td>
</tr>
<tr>
<td>Pedagogies</td>
<td>0.74</td>
<td>0.67</td>
<td>0.80</td>
<td>1.00</td>
<td>0.76</td>
<td>0.69</td>
<td>0.61</td>
<td>0.44</td>
<td>-0.11</td>
<td>0.70</td>
</tr>
<tr>
<td>Students</td>
<td>0.99</td>
<td>0.99</td>
<td>0.98</td>
<td>0.76</td>
<td>1.00</td>
<td>0.92</td>
<td>0.99</td>
<td>0.99</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Management</td>
<td>0.99</td>
<td>0.99</td>
<td>0.98</td>
<td>0.69</td>
<td>0.92</td>
<td>1.00</td>
<td>0.92</td>
<td>0.99</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Ecotourism</td>
<td>0.87</td>
<td>0.85</td>
<td>0.98</td>
<td>0.61</td>
<td>0.99</td>
<td>0.92</td>
<td>1.00</td>
<td>0.96</td>
<td>0.92</td>
<td>0.92</td>
</tr>
<tr>
<td>Hospitality</td>
<td>0.98</td>
<td>0.96</td>
<td>0.99</td>
<td>0.44</td>
<td>0.99</td>
<td>0.99</td>
<td>0.96</td>
<td>1.00</td>
<td>0.99</td>
<td>0.99</td>
</tr>
<tr>
<td>Economic</td>
<td>0.99</td>
<td>0.99</td>
<td>0.98</td>
<td>-0.11</td>
<td>1.00</td>
<td>1.00</td>
<td>0.92</td>
<td>0.99</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Teaching</td>
<td>0.99</td>
<td>0.99</td>
<td>-1.00</td>
<td>0.70</td>
<td>1.00</td>
<td>1.00</td>
<td>0.92</td>
<td>0.99</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>
there is greater attention to EDS on university education. And, specifically to sustainable teaching techniques or the perception of sustainability by tourism students, both of them are ones of the most difficult matters to implement successfully EDS on university education.

It is hoped that the number of publications related to education and sustainability will continue to increase according with international consensus that achieving sustainable development is essentially a process of learning at a time when sustainability in its three dimensions: social, economic and environmental seems more necessary than ever.

LIMITATIONS AND FUTURE RESEARCH

Main limitation of this study are the delimitation of the work to be analysed through the selected database, Scopus. Although this is one of the most complete bases with the largest number of scientific and academic publications, there may be other works not indexed in this database that have been ignored. As a second limitation, mention the selected words for the filtering of works. The most significant words have been chosen for this study “Sustainability+tourism+education”, and the search has been extended to titles, keywords and abstracts, but there may be works linked to the topic that do not explicitly use these words.

Based on these two limitations, they are proposed as future research lines, first, a research that expands the number of papers analysed using other databases in addition to Scopus, for example, Web of Science. Also expand searches using various combinations of filtering words (education, sustainability, sustainable, tourism, tourist, training...). In addition, it is planned to expand the study with a second phase of primary data collection via survey of university education students in tourism, using items and scales that value the use of sustainability in tourism education.
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