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Trends in Scientific Publishing on Sustainability in Higher Education

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Abstract

It is widely acknowledged that research and publications in peer reviewed journals offer important metrics in describing the academic outputs of higher education institutions on one hand, and their societal impacts on the other. Peer review is a well-tested method for quality control and has been successfully deployed over many decades in academic journals worldwide. But despite the fact that publications on matters related to sustainable development offer solid evidence of academic activity and excellence, there is a dearth of literature in this field. In order to address this need, the European School of Sustainability Science and Research (ESSSR) and the Inter-University Sustainable Development Research Programme (IUSDRP) have undertaken the World Survey on Sustainability Publishing and Research in Higher Education (WSSSP-HEI). The paper has two main aims. The first is to document and showcase trends in scientific publishing on matters related to sustainable development. The second aim is to contribute to a greater understanding of this rapidly growing field, by describing the latest developments and the role played by some of the journals active in this area. Consistent with these aims, this paper focuses on publications on sustainability in higher education, describes the methods used in the study and some of its results. It can be seen that despite the intrinsic value of research on sustainable development in higher education as a whole, and of publications in this field in particular, such practices are not as widely developed as one could expect. This paper discusses the possible reasons and also outlines some measures via which higher education institutions may be able to take more advantage of the many opportunities that publishing on sustainability offers to them.

Keywords: publications; publish or perish; sustainability articles; sustainability books; higher education

1 Introduction: Scientific publications on Sustainability in Higher Education

The engagement of higher education institutions (HEIs) worldwide in sustainable development (SD) was highlighted for the first time in the 1972 Stockholm Declaration on the Human Environment. Ever since, HEIs have engaged in several global initiatives

41 and expressed their commitment to SD in a variety of national and international
42 declarations, agreements and conventions (Lozano et al. 2013). The related actions and
43 results have been increasing and reflect the growing number of publications on the topic
44 of sustainability in higher education.

45 At the outset, it is relevant to outline some of the work definitions to the main
46 terms deployed in the study. The first term to be defined, namely "sustainability in
47 higher education", refers to matters related to sustainable development in a higher
48 education context. In other words, this term describes sustainability-related
49 components of relevance to tertiary education. The second term which should be
50 defined is "sustainability". Here it is used to describe socio-ecological process
51 via which a holistic view of nature and a balanced use of natural resources is
52 advocated, so as to achieve societal gains.

53 Finally, the term "sustainability publishing" is herewith used, in order to focus on
54 publications whose main subject and focus is on sustainable development. Therefore,
55 the very specific nature of this paper means that the focus is not on publications on
56 general issues or matters of wider interest, but quite focused on sustainable
57 development.

58 Sustainability in higher education has a potential influence on the exchange of
59 information between various aspects of sustainability (Davin 2015). In this sense, the
60 publications on sustainability in higher education have been deeply involved in themes
61 related to the role of HEIs: education, campus operations, community
62 engagement/outreach, and governance (Kapitulcinová et al. 2017).

63 Most publications show reports and case studies regarding the initiatives and
64 activities for sustainability. These initiatives take different applications and cover
65 multiple areas. Beringer and Adombent (2008) emphasize that sustainability research in
66 the higher education spectrum is broad, with scientific inquiry taking many different
67 forms and pathways regarding research paradigms, designs, methodology practical
68 goals and aspirations. In another study, Caniglia et al. (2017) analyze the transnational
69 collaboration for sustainability in higher education, identifying the main research
70 activities as virtual research, single projects multiple projects, and visiting scholars
71 projects. The authors' research found a low frequency of these activities, and they argue

72 that it may be due to the low research rate in international partnerships, or because
73 individual researchers are preferred to institutional partnerships.

74 An increasing number of studies point out sustainability in higher education in
75 general, including discussions about the barriers and challenges for implementing
76 sustainability in HEIs (Aleixo et al. 2019; Ávila et al. 2017). Some publications cover
77 conceptual descriptions, practical experiences and parallels among the variety of
78 sustainability assessment tools (Shriberg 2002; Caeiro et al. 2013), and other
79 publications address university rankings (Torabian 2019).

80 There are several specific research areas within sustainability in HEIs which have
81 experienced significant growth in the last few years. Three of these areas include the
82 Living Labs methodology, Climate Change Education, and SDGs implementation.

83 A growing focus of research in the field of sustainability in higher education is the
84 utilization of ‘Living Labs’ which aid HEIs in conducting research that has relevance to
85 society and which addresses real-world sustainability issues (Leal Filho et al. 2019a).
86 Research on living labs and sustainability indicates that technological innovation needs
87 to be interwoven with social and cultural aspects over a long time period in order to
88 achieve the required outcomes (Von Geibler 2014). The research work is usually
89 published as case studies. It includes wide-ranging domains in sustainability, such as the
90 implementation of solar-powered schools (REGSA 2016), the formation and evolution
91 of university degrees (Mifsud 2014) and the utilization of open and distance learning
92 (Nicolau et al. 2018).

93 Research on the role of HEIs and climate change has increased during the last
94 decade due to the scientific, social, environmental and political challenges that the
95 phenomenon has created on the entire biosphere. The most common approach utilized
96 by HEIs in this area appears to be the embedding of climate change education in their
97 curricula and the research framework employed to achieve this (Leal Filho et al. 2019b).
98 A further area of enquiry focuses on students and universities that specialize in climate
99 change adaptation expertise and mitigation tools (Hill et al. 2019).

100 A relatively new area which is seeing a lot of growth and publications is the study
101 of the relevance, relationships and possible implementation strategies to achieve the UN
102 Sustainable Development Goals (SDGs) within HEIs. (Leal Filho 2019c). HEIs are
103 working to incorporate the ambitious 17 goals into their agendas and policies and to

104 achieve the SDGs. Due to the multi-stakeholder platform and the participation from
105 numerous institutions, there are multifaceted opportunities for research and publications
106 both in work evaluation and in capacity building (Shiel et al. 2015).

107 Several HEIs have developed a wide range of initiatives in order to embed
108 sustainability within their organization. These can be broadly categorized under
109 education, outreach, research, operations, and governance (Lozano et al. 2015). All
110 these possibilities are the reasons why publications on sustainability in higher education
111 in the databases have increased, both in terms of the scope of the subject and their
112 geographical range during the last decade.

113 The analysis of publications shows that the journals which most commonly
114 published on this subject are the *International Journal of Sustainability in Higher*
115 *Education*, the *Journal of Cleaner Production*, *Sustainability*, *Environmental Education*
116 *Research and Quality Management in Higher Education*. Besides those, more than 98
117 other journals include publications on the subject.

118 The selection of journals for publication is linked to many factors. Authors are
119 increasingly publishing in open access journals and are responsive to library funding
120 initiatives. However, the prestigious closed access journals still range high on the wish-
121 list of the authors. Another aspect is the Impact Factor of the journal, which indicates
122 the most extensive exposure and reach of the peer community (Nariani and Fernandez
123 2012).

124 Even though publications on issues related to sustainable development offer
125 substantial evidence of academic activity and excellence, there is a dearth of literature
126 related to this topic and a lack of studies which give a broad view of worldwide
127 publications over time. In order to address this need, the European School of
128 Sustainability Science and Research (ESSSR) and the Inter-University Sustainable
129 Development Research Program (IUSDRP) have undertaken the World Survey on
130 Sustainability Publishing in Higher Education (WSSSP-HEI). The objective of this
131 study was to shed some light on the nature of publications on sustainability, with
132 information which may enhance both the current and future potentials in this field.

133 There are three main factors which outline the relevance of this research. The first,
134 is that the complexity of sustainability publishing makes it sometimes difficult to
135 understand its true nature and usefulness. Secondly, sustainability publishing entails

136 environmental, social and economic elements which are broad and difficult to precisely
137 define. Finally, it encompasses various fields of academic research that aim to address
138 various issues, from the natural environment and ecosystems, to human behaviour,
139 financial elements and technical issues, among others.

140 This paper takes all these items into account. It has two main aims. The first is to
141 document and showcase trends in scientific publishing on matters related to sustainable
142 development. The second aim is to contribute to a greater understanding of this rapidly
143 growing field, by describing the latest developments and the role played by some of the
144 journals active in this area. Apart from showcasing some of the trends in scientific
145 publishing on sustainability in higher education, this paper also presents an overview of
146 measures via which higher education institutions may be able to take more advantage of
147 the many opportunities that publishing on sustainability offers to them.
148

149 **2 The role of peer review in quality assurance in higher education and its** 150 **links with sustainable development**

151 Peer review requires a collegiate approach between editors, reviewers and authors
152 that, in the advancement of disciplines and professions, necessitates due courtesy,
153 empathy and diligence from all (Desselle et al. 2019). The importance of publishing for
154 tenure, promotion and entry-level positions is recognized by authors (Teele and Thelen
155 2017), and they regard the contribution of peer reviewers beneficial for developmental
156 feedback (Atjonen 2019), constructive comments (Roll 2019), and improvements to
157 manuscript quality, readability and accuracy (Rowley and Sbaffi 2018). Editors across
158 disciplines agree that the peer review process should critically assess manuscripts for
159 clarity of thought, objectivity and knowledge (Pollock 2019), quality and
160 methodological rigor (Roll 2019), novelty and significance (Alexandratos et al. 2017),
161 and it should demonstrate clear links to the aims and scope of the journal (Pollock 2019;
162 Alexandratos et al. 2017; Roll 2019). Furthermore, as a measure of performance, editors
163 see the “publication of peer-reviewed evaluations as the gold standard in reporting
164 impact” (Font et al. 2019 p. 7).

165 However, authors, reviewers and editors are part of a system that protects
166 opinions, methods and innovations by promoting an ‘in-crowd’ (Frijters and Torgler
167 2019 p. 1286). Authors have been accused of assessing publication value by impact
168 factors or prestige, rather than the rigor and quality of each peer reviewed submission
169 (Schimanski and Alperin 2018). Reviewer expertise and experience are also open to
170 criticism, being blamed for the exercise of power, gatekeeping, paradigm contradiction

171 and insufficient expertise (Atjonen 2019), as well as for providing descriptive praise or
172 criticism, instead of practical guidance for improvement of manuscripts (del Fierro et al.
173 2018). Even though peer reviewers are impartial experts (Roll 2019), there is
174 recognition by editors that the peer review process is not without bias (Pollock 2019).
175 With single-blind, double-blind, triple-blind, quadruple-blind and open peer review
176 approaches in use, there is a need for improvement in transparency, accountability,
177 quality and further research on the peer review process (Haffar et al. 2019).

178 Editors rely on reviewer efficacy and effectiveness, but with peer reviewed
179 scientific outputs continuing to increase, this impacts experienced reviewers (Curtain et
180 al. 2019). Increasingly multi-tasking, these reviewers are becoming time-challenged,
181 which leads to delays (Sonne and Alstrup 2019), demotivated, due to repeated rejection
182 of the same paper (Drvenica et al. 2019), and concerned that quality cannot be
183 guaranteed as the process is not functioning well (Curtain et al. 2018). Editors are clear
184 as to the reasons for rejection under peer review, these being factors of poor journal fit,
185 lack of insight, fatal flaws, or lack of development (Pollock 2019), or factors of error,
186 language, or lack of explanation or mechanisms (Alexandratos 2017). However, with
187 the pressure for authors to publish and the high levels of rejection from legitimate
188 scholarly journals, there is motivation to publish in predatory journals (Alrawadieh
189 2018), cite rejected papers (Sonne and Alstrup 2019), trade authorship and fake peer
190 review (FPR) (Rivera 2019).

191 The legitimacy and credibility of scientific knowledge is dependent on the quality
192 process of peer review. If the speed of spurious news delivery via mass and digital
193 communications impacts negatively on societal knowledge, then this will influence
194 public health, environmental and medical science (Sonne and Alstrup 2019). A key
195 strategy of climate science denialism is the creation of fake controversies (Hansson
196 2017). Therefore, a healthy peer reviewed debate is required not only to advance
197 knowledge but to highlight errors, inaccuracies and misinformation (Hall et al. 2015a).
198 This is clearly demonstrated in a debate over several papers on climate change
199 scepticism: “Climate change and tourism: Time for environmental scepticism” (Shani
200 and Arad 2014); “No time for smokescreen scepticism: A rejoinder to Shani and Arad”
201 (Hall et al. 2015a); “There is always time for rational scepticism: Reply to Hall et al”
202 (Shani and Arad 2015); and “Denying bogus scepticism in climate change and tourism

203 research” (Hall et al. 2015b). The final response suggests that the “obfuscation of
204 scientific research” can have long-term negative consequences for policy and action in
205 relation to climate change (Hall et al. 2015b p. 352). This has a direct impact on the
206 achievement of the Sustainable Development Goals.

207 In consideration of the impact of Higher Education Institutions (HEIs) on
208 sustainable development, there was a noted increase in publishing between 2005-2017
209 (Findler et al. 2018). Over half of the 113 peer reviewed journal articles representing the
210 ‘state of knowledge’ were submitted in the final four years (Findler et al. 2018).
211 Furthermore, a fragmented discourse was identified across a wide journal base, although
212 the ‘Journal of Cleaner Production’ and ‘International Journal of Sustainability in HE’
213 had the highest contributions (Findler et al. 2018). Special issues might account for
214 some of the fragmented discourse: “Evidence for upscaling existing SDGs policies and
215 programmes in African countries” (Okonofua 2016); “Work-based and vocational
216 education as catalysts for sustainable development” (Wall and Hindley 2018). However,
217 movement beyond peer reviewed special issues is needed. The Journal of Sustainable
218 Tourism’s editorial team reflected on how their publication could help authors achieve
219 more impact with their research, resulting in a decision to “ask all authors to frame their
220 submitted articles against the Sustainable Development Goals” (Font et al. 2019 p. 9).
221 Nevertheless, there is overall a lack of strategies that promote international research
222 (Caniglia et al. 2017) and publication. This paper seeks to contribute to this discussion.

223

224 **3 Methodology**

225 In order to assess the trends of scientific publishing on sustainability in Higher
226 Education, the World Survey on Sustainability Publishing in Higher Education
227 (WSSSP-HEI) was undertaken. It was divided into two parts: research (I) and
228 publishing (II). The part on research will be the subject of another paper. Regarding part
229 (II), the methodological steps included the survey development (definition of questions,
230 pre-test and preparation of final version), survey dissemination, and data analysis. Each
231 step is detailed as follows.

232 The questionnaire had an initial section on demographic details, enquiring
233 respondents for details of their universities (name, department, and country) and their

- 234 age group, gender and background (Education, Social Sciences, Natural Sciences,
235 Engineering & Technology and Other). In the sequence, the questions related to the:
- 236 a) Number of book chapters on matters related to sustainable development (SD) in
237 higher education (HE) published by the respondent over the past five years;
 - 238 b) Number of books on matters related to SD in HE edited or co-edited and
239 published by the respondent over the past five years;
 - 240 c) Number of articles on matters related to SD in HE published by the respondent
241 in journals which are peer-reviewed and have an impact factor over the past five
242 years;
 - 243 d) Journals in which the respondents usually publish their research (e.g. Journal of
244 Cleaner Production; Int. J. of Sustainability in Higher Education; Int. J. of
245 Sustainable Development and World Ecology, among other options);
 - 246 e) Areas on SD in HE the papers usually focus on (i.e. Sustainability in higher
247 education in general, campus greening, teaching issues, research issues);
 - 248 f) Main reasons for choosing a journal/book to publish their research.

249 The questions were initially prepared by the authors and pre-tested by
250 researchers and professors working the social and environmental sciences, and with
251 expertise in sustainability in higher education, hence catering for a wide range of
252 perspectives.. The final survey (Appendix A) was then disseminated online (through
253 Google Forms) to all members of the Inter-University Sustainable Development
254 Research Programme (IUSDRP, [https://www.haw-hamburg.de/en/ftz-
255 nk/programmes/iusdrp.html](https://www.haw-hamburg.de/en/ftz-nk/programmes/iusdrp.html)), a network of universities committed to sustainability. The
256 Programme has over 140 member universities, and the participants who receive the
257 communications are members of administrative sectors or researchers/professors
258 actively involved in matters related to SD in their organizations, thereby ensuring the
259 reliability and validity of this methodological approach.

260 The online survey remained active from June to October, 2019 and collected 103
261 responses from 43 different countries. Simple descriptive statistics to summarize and
262 discuss the collected data was used for the analysis. The results will be presented
263 following each survey section.

264

265 **4 Results and Discussion**

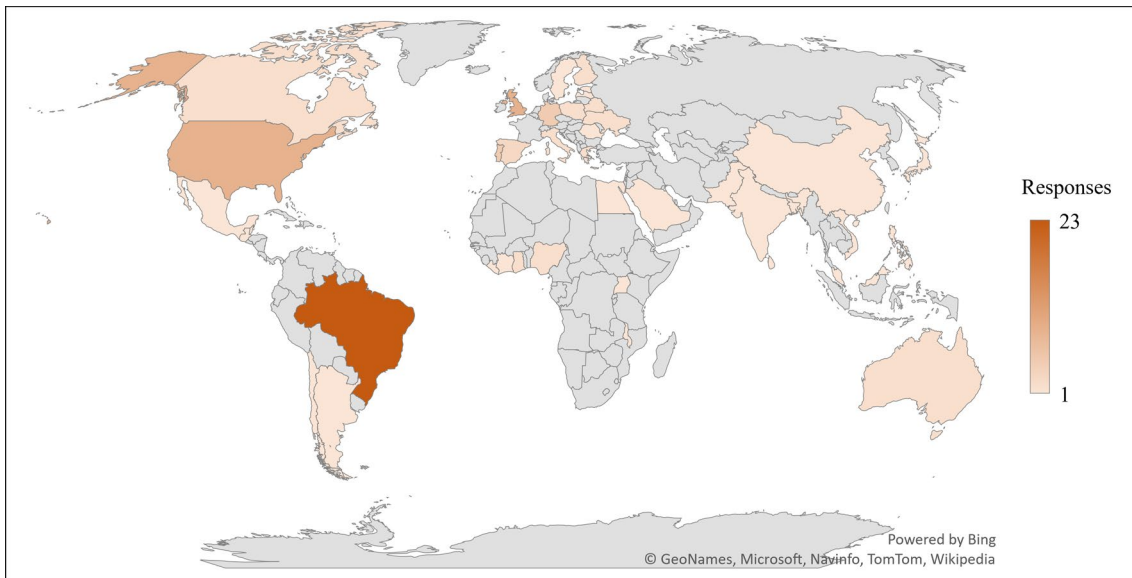
266 This section starts by describing the trends in scientific publishing on
267 sustainability in higher education collected from the worldwide survey. By the end, it
268 presents an overview of measures that universities and researchers can adopt to improve
269 their publishing opportunities.

270

271 *4.1 Demographic details*

272 Figure 1 shows the 43 countries represented in the study, and the intensity in the
273 number of responses. From the Americas, the participant countries were Argentina,
274 Bahamas, Belize, Brazil, Canada, Chile, Guatemala, Mexico and USA; from Africa:
275 Cote d'Ivoire, Egypt, Ghana, Liberia, Malawi, Nigeria and Uganda; from Asia/Oceania:
276 Australia, Bangladesh, China, Hong Kong, India, Japan, Malaysia, Pakistan,
277 Philippines, Saudi Arabia, Sri Lanka and Vietnam; and from Europe the participant
278 countries were Belarus, Estonia, Finland, Germany, Greece, Italy, Latvia, Malta,
279 Poland, Portugal, Romania, Spain, Sweden, Ukraine and the UK.

280 Figure 1. Countries which participated in the survey (and intensity of the number of
281 responses)



282

283 Source: Prepared by the Authors

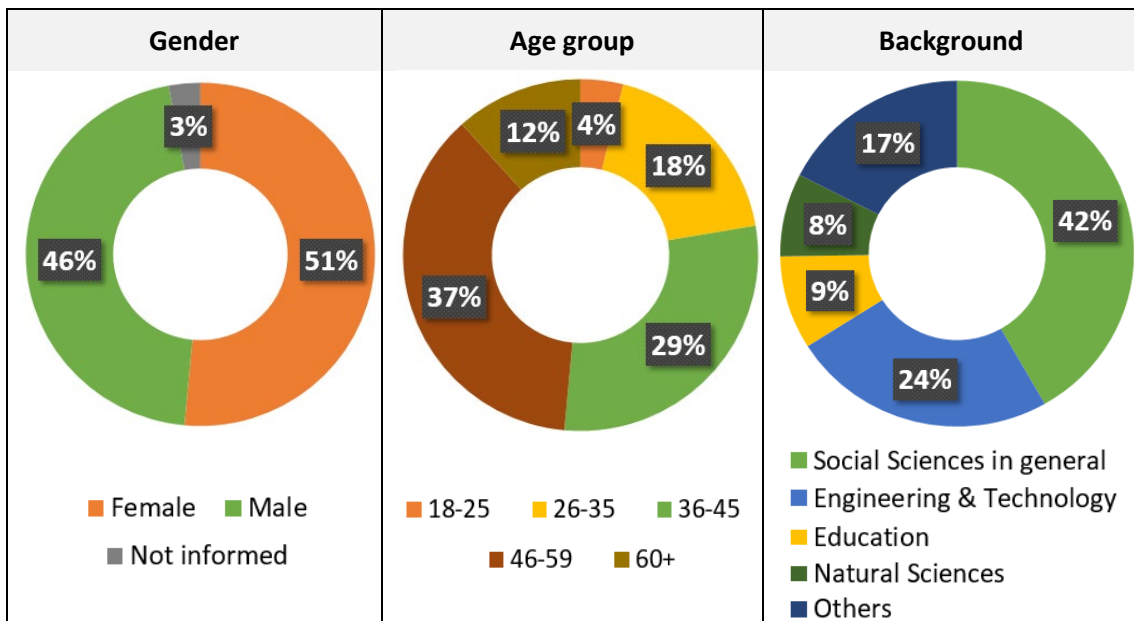
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285 Figure 2 summarizes the sample demographic details: when it comes to gender,
286 51% of the respondents are female, 46% are male, and 3% preferred not to state.
287 Regarding the age group, the survey received responses from all levels: 4% in the age

288 group of 18-25, 18% between 26-35 years of age, 29% between 36-45 years of age.
 289 The majority of the sample, 37%, is between 46-59 years of age; only 12% are 60 years
 290 of age or more. Regarding background, more than 40% are from the social sciences,
 291 and more than 20% from engineering and technology. Other areas, such as education
 292 and natural sciences, are represented by a lesser proportion.

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 299

300 Figure 2. Sample demographic details (gender, age group and background)



301

302 4.2 Number of publications

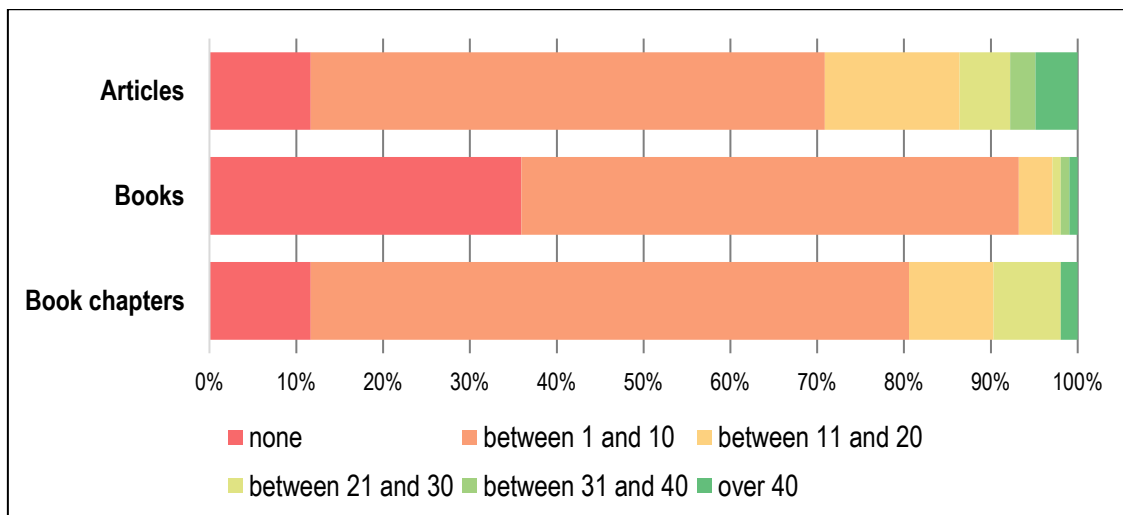
303 Publications are relevant for researchers in order to share their studies and get
 304 recognition from their peers. From a practical point of view, they are often used when
 305 decisions on promotion or tenure are to be taken. The primary modalities include
 306 publishing books, book chapters or journal articles. The survey started by asking the
 307 respondents to indicate the number of books and book chapters on matters related to
 308 sustainable development in higher education that were published by them over the past

309 five years, as well as the number of articles published in peer reviewed journals in the
 310 same period. Figure 3 summarizes the responses for the three types of publication,
 311 including the percentage of responses according to the number of publications in the last
 312 years.

313 Interestingly, the majority of the respondents in the sample stated to have
 314 published less than ten publications or none, regardless of the type of publication,
 315 during the last years. For books, however, the percentage of respondents which
 316 indicated “none” is higher than the other groups (>35%). For book chapters and articles,
 317 this percentage was approximately 10%. On average, among all types of publications,
 318 journal articles are more commonly published, reaching almost 10% of responses in the
 319 categories “between 31 and 40” and “over 40,” while the same categories resulted in
 320 only 2% for books and book chapters. Although the peer review process for books and
 321 book chapters might be slightly less complicated, authors may prefer publishing journal
 322 articles for reasons associated with the evaluation of scholarship in general (Arnăutu
 323 and Panc 2015; Schimanski and Alperin 2018), curriculum scores and demands from
 324 graduate programs (Dyke 2019; Harris 2015; Rawat and Meena 2014). Additionally,
 325 books demand coordinated efforts and support from the publisher (Cortada 2017).

326

327 Figure 3. Results on the number of book chapters, books and articles published by the
 328 respondents



329

330

331

4.3 Main journals

332 The survey also intended to find out in which journals the respondents usually or
333 frequently publish their research. Among the given options, two were the most
334 indicated: *International Journal of Sustainability in Higher Education* (indicated by
335 39% of the respondents) and *Journal of Cleaner Production* (indicated by 37% of the
336 respondents). This is one of the key results from this analysis. It indicates that these
337 options as the most preferred ones to publish studies related to sustainability in higher
338 education, and virtually dominate the sustainability in higher education conversation.

339 Looking into the journals which address environmental management performance
340 issues at HEIs, Guenther and Ross (2020) corroborate these results by indicating that
341 the majority of publications are published in the *International Journal of Sustainability
342 in Higher Education* (IJSHE) (45%) and *Journal of Cleaner Production* (JCP) (41%),
343 with only around 14% of literature being published in various other journals (Guenther
344 and Ross, 2020).

345

346 These include journals such as "Environment and Sustainable Development"
347 (16%) and "Journal of Environmental Management" (15%).

348 An additional 48 responses were received in the option "Others," where
349 respondents could mention journal titles not presented

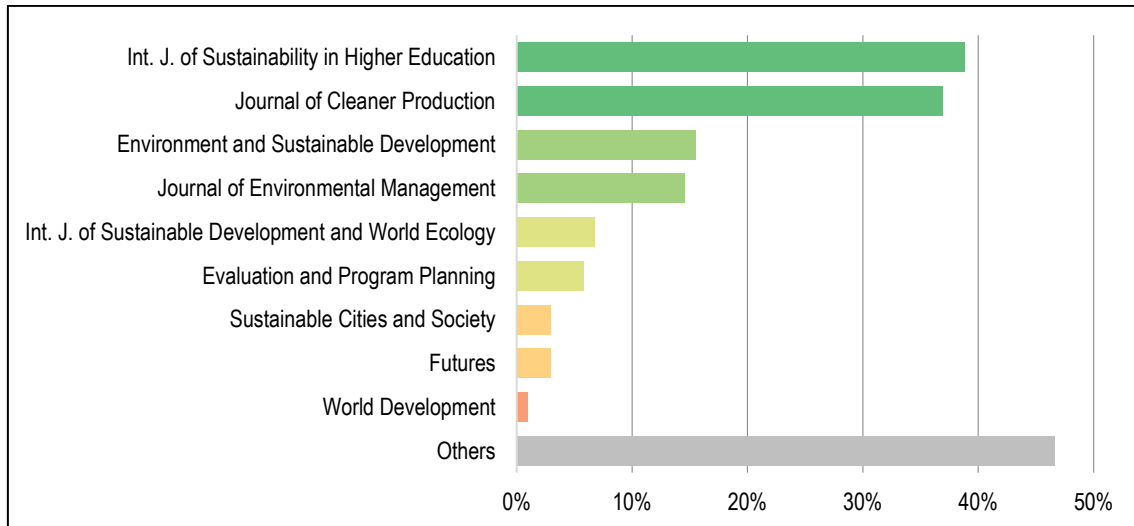
350 in the offered options. Of these, the most recurring journal was "Sustainability",
351 with eight mentions. This is also a

352 key result, since these periodicals account for about a third of the journals
353 mentioned sample.

354 Other journals refer to climate change and educational issues, in addition to
355 energy and sustainability challenges in general. It can also be highlighted the presence
356 of local/national journals, which publish papers in other languages (such as Spanish and
357 Portuguese). Figure 4 presents these results.

358

359 Figure 4. Journals preferred by the respondents for publishing



360

361 *4.4 Areas and reasons*

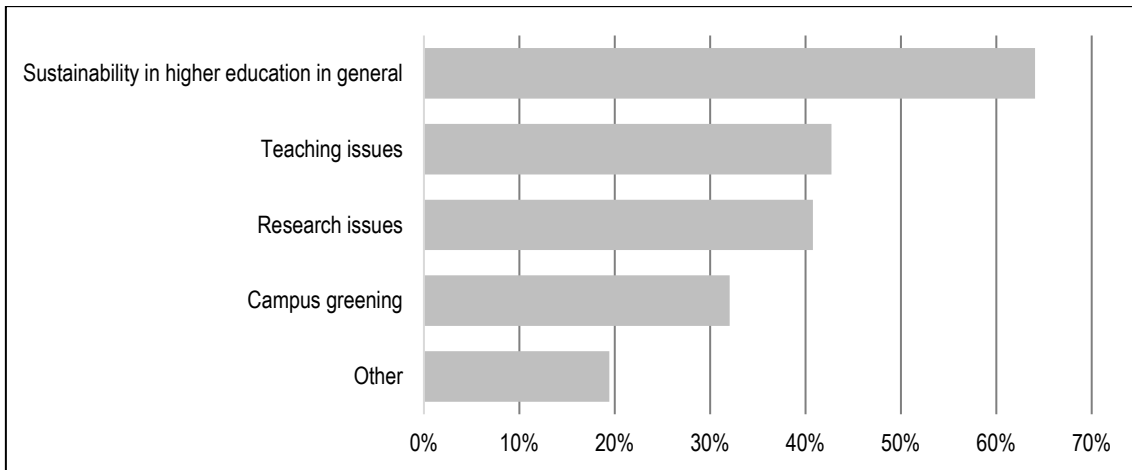
362 When asked about the areas of sustainable development in higher education that
 363 the published papers usually focus on (Figure 5), the respondents indicate Sustainability
 364 in general as the most common topic (>60% of responses). This was already expected at
 365 a certain point, since several studies may not fall under a specific approach on teaching,
 366 research or campus operations. With around 40% of the responses, the following most
 367 common areas are: **teaching and research issues**, which include teaching techniques
 368 and innovative approaches for teaching education for sustainable development
 369 (Hermann and Bossle 2020; Lozano and Young 2013) and **challenges and**
 370 **opportunities** for researching sustainability (Barbosa-Póvoa et al. 2018; Salvia et al.
 371 2019; Turnheim et al. 2020), among others. Campus greening was indicated by 32% of
 372 the sample. However, its contribution towards publications on the topic might increase,
 373 mainly due to recent publications which support this matter [e.g. “Books Universities as
 374 Living Labs for Sustainable Development - Supporting the Implementation of the
 375 Sustainable Development Goals” (Leal Filho et al. 2020) and “Towards Green Campus
 376 Operations - Energy, Climate and Sustainable Development Initiatives at Universities”
 377 (Leal Filho et al. 2018)].

378 The option “Other” contained further interesting results. The respondents included
 379 topics such as the Sustainable Development Goals, climate change efforts, sustainable
 380 procurement at universities, sustainable consumer behaviour, in addition to others that
 381 may represent connections with society in general and local communities (capacity

382 building, social innovation, global citizenship, urban mobility and poverty, religions and
383 sustainability, psychological aspects and sustainable construction projects).

384

385 Figure 5. Areas of SD in HE the papers usually focus on



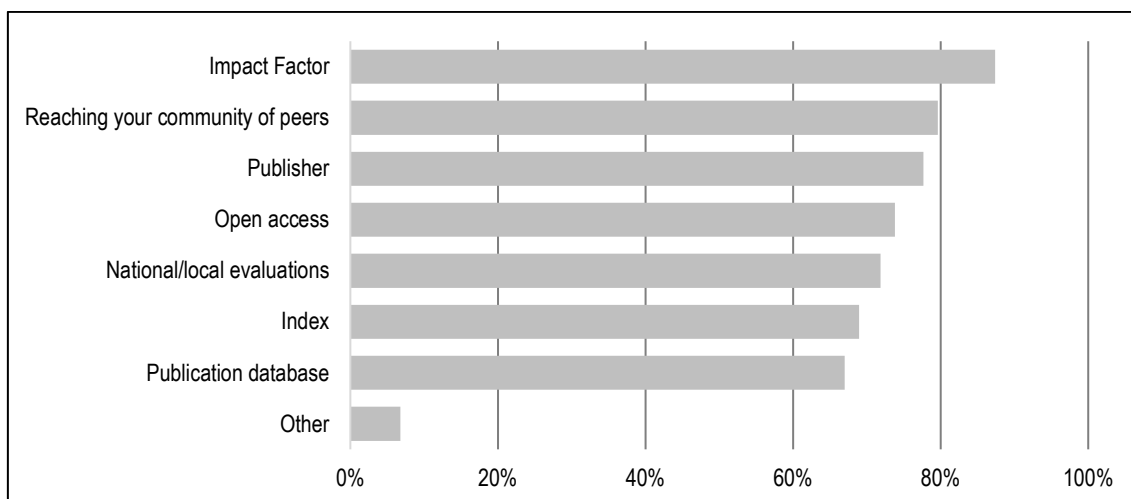
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387

388 As already touched upon, one may wonder about the reasons for choosing a
389 certain journal/book to publish a study. In this regard, Figure 6 shows the main reasons
390 indicated by the respondents for choosing a publication. Impact factor should be
391 highlighted as the most mentioned reason (indicated by 87% of the respondents).
392 Reaching the community of peers (80%) and the publisher (78%) were the next most
393 indicated reasons, followed closely by the Open Access availability (74%). **This is also**
394 **a key result.** The least indicated reasons (but still indicated by 67-72% of the sample)
395 are national/local evaluations, Indexes and publication databases. An additional seven
396 comments (7%) were included in the space for “Other” responses, and they are related
397 to the adherence of the paper subject to the scope of the journal/book, the ease in
398 handling the publication (probably meant by the respondent as the steps of submission
399 and peer review until getting the study finally published) and the case of being invited
400 by peers to submit studies to a publication.

401

402 Figure 6. Main reasons for choosing a journal/book to publish research



403

404

405 *4.5 Discussion*

406 The results indicate that the reasons behind the choice of where to publish may
 407 vary, and they depend on the relevance that authors give to specific factors. Although
 408 the publishing process used to take a rather long time in the past (depending on the
 409 publisher, type of publication, and peer review process, among others), this is not so
 410 today. Many publishers are able to make an accepted paper available with a DOI and
 411 ensure they can be cited a few weeks after being accepted. The advantages of this new
 412 trend are innumerable.

413 All these elements reiterate the advantages academics may have, by being aware
 414 of the publishing opportunities in the topic of sustainability in higher education. The list
 415 below presents some insights on how to take more advantage of these opportunities,
 416 based on the authors' experience:

- 417 a) Participate in national and international sustainability networks: these networks
 418 work as complex and integrated spaces for universities and researchers who
 419 share a common goal to support each other. Partnerships for publications and
 420 projects are among their advantages and purposes (Bixler et al. 2019; Keeler et
 421 al. 2016). The IUSDRP, for example, has among its aims to “catalyse and
 422 facilitate the production of high-quality joint publications in indexed journals, as
 423 well as in ground-breaking books and book chapters, in cooperation with well-
 424 established publishers” (IUSDRP n.d.).
- 425 b) Subscribe to mailing lists on the topics of interest: through these lists,
 426 researchers can invite other colleagues to work on project proposals,

- 427 publications and even partnerships for events, for example. Calls for authors for
428 diverse publishing opportunities are common and frequent;
- 429 c) Contact editors and editorial teams of journals informing them of one's interest
430 to act as a reviewer: being available to act as a reviewer (given the topic reflects
431 the researcher expertise area) may increase one's chances to publish more – not
432 solely for gaining experience on the topic, but also for getting recognition in the
433 area (Verbeke et al. 2017);
- 434 d) Participate in conferences which lead to publications in journals/books: there are
435 other various reasons to choose conferences to attend and present research
436 results, but whenever appropriate and suitable, researchers may consider those
437 that promote high-impact publications.

438 These recommendations will assist authors in recognizing diverse publishing
439 possibilities and choosing the ones that respond to their main reasons for publishing.
440 These findings corroborate with Caniglia et al. (2017), specifically focusing on
441 communication strengthening and the collaborative process, which can contribute to
442 increasing the low research rate in international partnership.

443 Based on these contributions, the following framework is suggested to increase
444 the publication rate in sustainability in higher education (Figure 7).

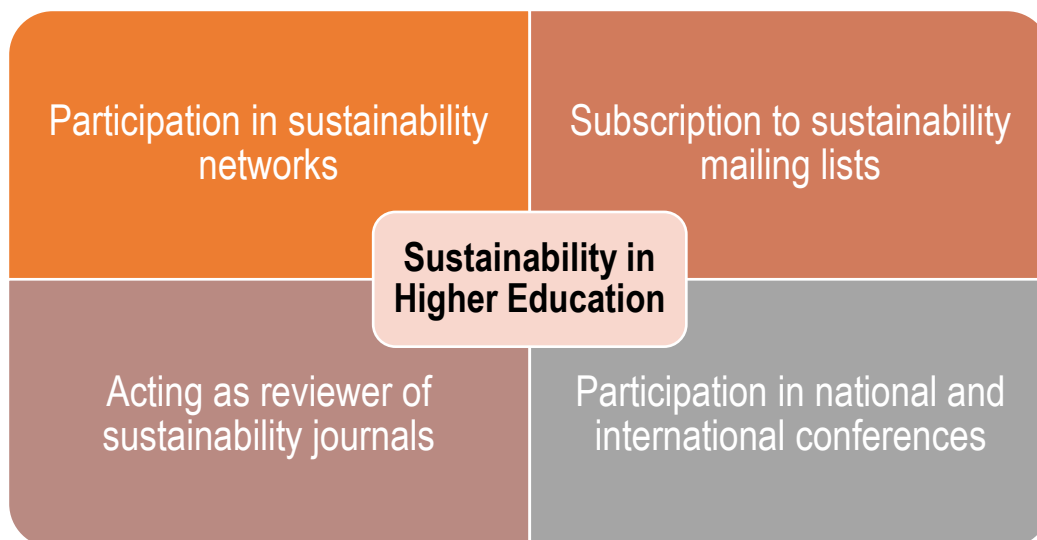
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449 Figure 7 - Framework to increase publications on Sustainability in Higher Education



450

451

452 From the framework, it can be seen that academics have many disadvantages
 453 when they work alone. By taking part on sustainability network and being kept informed
 454 about progresses in mailing lists, they can be kept abreast of the latest development, and
 455 access information they would not normally not become aware of. An example is the
 456 IUSDRP mailing list which can be accessed for free at: [https://www.jiscmail.ac.uk/cgi-](https://www.jiscmail.ac.uk/cgi-bin/webadmin?A0=IUSDRP)
 457 [bin/webadmin?A0=IUSDRP](https://www.jiscmail.ac.uk/cgi-bin/webadmin?A0=IUSDRP). It contains information on events, publishing opportunities
 458 and project calls, which academic staff may find very useful.

459 Also, academic staff may wish to act as reviewers in sustainability journals, being
 460 able to obtain information on recent research. Moreover, participation in international
 461 events, albei costly, often proves to be a good investment since many are in fact in-service
 462 training and offer the opportunity to meet individuals who are otherwise known from the
 463 literature. The current restrictions posed by the COVID-19 pandemic do not need to
 464 adversely affect communication or networking among academics: even though physical
 465 events cannot at present be easily organised or held, on-line events offer a good
 466 complement. This is not to say that on-line events could ever replace presence ones. But
 467 they do offer an alternative, until it is safe again to organised normal Symposia,
 468 Workshops or Congresses.

469

470

471 **5 Conclusions**

472 As this paper has shown, publications on matters related to sustainable development
473 are good indicators of academic activity and excellence. They provide valuable venues
474 for discussing issues pertaining to sustainable development, showing the plurality of
475 viewpoints and perspectives and documenting experiences.

476 Before dwelling on the conclusions, it should be reiterated that female participants,
477 (with 51%) had a slightly higher engagement in the study than their male counterparts.
478 Senior researchers, between 36 and 59 years of age, accounted for 65% of the
479 respondents, in the context of which the social sciences were twice as highly represented
480 in the study as engineering and technology.

481 The survey undertaken has identified a number of trends. The first one is that over
482 half of the 113 peer reviewed journal articles published and representing the 'state of
483 knowledge' were submitted in the last four years. This suggests an intensification of
484 research efforts, coupled with an increased in the willingness to submit this work to peer
485 reviewed journals. Secondly, there is a trend towards a fragmented discourse, i.e. a
486 discourse focusing on specific issues, thanks to the production of special issues. These,
487 however, present one advantage: they may address the concerted coverage of some topics
488 (e.g. sustainability governance, sustainability reporting), which may not otherwise be well
489 covered elsewhere. In addition, articles in journals are seen to be more popular than book
490 chapters. Furthermore, it is clear that two journals seem to dominate the conversation of
491 sustainability in higher education, with over 3/4 of all papers published on this subject
492 matter, namely the *International Journal of Sustainability in Higher Education* and the
493 *Journal of Cleaner Production*.

494 Whereas "sustainability" as a general term appears to be the most popular theme,
495 the study has shown that papers on teaching, research or campus operations are also
496 popular. Also, themes such as the Sustainable Development Goals, climate change and
497 sustainable procurement at universities, along with sustainable consumer behavior, are
498 increasingly popular topics.

499 The fact that nearly 90% of the authors indicated that the impact factor (followed
500 by Open Access) is the main criteria in the decision to publish in a particular journal
501 shows that these elements will also guide future decisions. This may be explained by the
502 fact that these indicators are used in decisions related to the tenure and promotion of

503 academics. Authors may benefit from accessing networks and mailing lists, and by
504 attending events and venues for accessing journals.

505 The research has some limitations. Firstly, the sample is too small to allow for a
506 broad extrapolation of the results. Secondly, its wide dissemination via various networks
507 is not a guarantee that it mobilized all concerned sustainability researchers. Nonetheless,
508 the data obtained offers a rough profile of how academic publishing on sustainable
509 development is perceived and practiced. Since the paper was not meant to cluster
510 responses among specific countries but to build a general profile instead, the purpose has
511 been achieved. It contains no specific geographical focus; rather, it needs to be
512 considered as a global study.

513 The present paper nevertheless provides a welcome addition to the literature since
514 it addresses the deficiency in studies on published research on matters related to
515 sustainable development. Its implications are two-fold: it offers a detailed overview of
516 the state-of-the-art on publications on sustainability in a higher education context,
517 outlining its main features. Also, it sheds light on the journals most active in the topic and
518 the level of emphasis they attach to various themes.

519 Methodologically, the approach used in this paper can be replicated and used in
520 similar studies, especially in those where a combination of qualitative and quantitative
521 data is important in order to allow a broader understanding of trends.

522 Looking forward, there are various measures via which higher education
523 institutions may be able to take more advantage of the many opportunities that publishing
524 on sustainability offers to them. Some of them are as follows:

525 * the SDGs offer universities good opportunities to document and promote their
526 works, be it in respect of policies or practical activities;

527 * authors should take more advantage of networks, mailing lists and conferences,
528 as a means of better engaging with their peers and accessing publishing opportunities;

529 * the specialist journals available and mentioned in this paper offer a solid basis for
530 scientific publishing, and have many published papers which may be used as reference
531 points.

532

533 As far as future steps are concerned, there is a perceived need for more research on
534 publishing trends which are specific to the social and natural sciences, since they adopt

535 different sustainability philosophies. In addition research is also needed on the extent to
536 which the SDGs are being taken into account in the context of scientific publishing. These
537 research gaps will be addressed in forthcoming studies being undertaken as part of the
538 newly-founded "The SDGs Academic Research and Publications Initiative" (SDG-
539 ARPI), whose details can be seen at: [https://www.haw-
540 hamburg.de/en/university/newsroom/news-details/news/news/show/new-research-
541 initiative-on-the-sdgs/](https://www.haw-hamburg.de/en/university/newsroom/news-details/news/news/show/new-research-initiative-on-the-sdgs/).

542 Overall, academic publications provide a valuable service in that they disseminate
543 case studies, projects and programs and report on the findings of studies and research on
544 sustainable development. As such, they are very important tools in fostering information
545 exchange and serve as a vehicle for the documentation and dissemination of what
546 government bodies, research agencies, international bodies, universities and aid agencies
547 are undertaking in the various pathways leading to a more sustainable world.

548

549 **Conflict of Interest**

550 The authors declare that they have no conflict of interest.

551

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721

722 **Appendix A.** Summary of the survey questions and response options

	Questions	Responses
Demographics	Name of your University:	
	Country:	
	Your age group:	<input type="radio"/> 18-25 <input type="radio"/> 26-35 <input type="radio"/> 36-45 <input type="radio"/> 46-59 <input type="radio"/> 60+
	Your gender:	<input type="radio"/> Female <input type="radio"/> Male
	What is your background?	<input type="radio"/> Education <input type="radio"/> Social Sciences in general (including politics, economics, arts, languages) <input type="radio"/> Natural Sciences <input type="radio"/> Engineering & Technology <input type="radio"/> Other
Number of publications	How many book chapters on matters related to sustainable development in higher education have been written and published by yourself/your team at your university over the past 5 years?	<input type="radio"/> none <input type="radio"/> between 1 and 10 <input type="radio"/> between 11 and 20 <input type="radio"/> between 21 and 30 <input type="radio"/> between 31 and 40 <input type="radio"/> over 40
	How many books on matters related to sustainable development in higher education have been edited or co-edited and published by yourself/your team at your university over the past 5 years?	<input type="radio"/> none <input type="radio"/> between 1 and 10 <input type="radio"/> between 11 and 20 <input type="radio"/> between 21 and 30 <input type="radio"/> between 31 and 40 <input type="radio"/> over 40
	How many articles on matters related to sustainable development in higher education have been published by yourself/your team at your university in journals which are peer-reviewed and have an impact factor, over the past 5 years?	<input type="radio"/> none <input type="radio"/> between 1 and 10 <input type="radio"/> between 11 and 20 <input type="radio"/> between 21 and 30 <input type="radio"/> between 31 and 40 <input type="radio"/> over 40

Main journals	In which journals do you usually publish? (multiple answers possible)	<input type="checkbox"/> Journal of Cleaner Production <input type="checkbox"/> Int. J. of Sustainability in Higher Education <input type="checkbox"/> Futures <input type="checkbox"/> Int. J. of Sustainable Development and World Ecology <input type="checkbox"/> Environment and Sustainable Development <input type="checkbox"/> Evaluation and Program Planning <input type="checkbox"/> World Development <input type="checkbox"/> Journal of Environmental Management <input type="checkbox"/> Sustainable Cities and Society <input type="checkbox"/> Other
	Which areas have the papers focused on in relation to sustainable development in higher education? (multiple answers possible)	<input type="checkbox"/> Sustainability in higher education in general <input type="checkbox"/> Campus greening <input type="checkbox"/> Teaching issues <input type="checkbox"/> Research issues <input type="checkbox"/> Other
Areas and reasons	Which are the main reasons for choosing a journal/book to publish your research? (multiple answers possible)	<input type="checkbox"/> Impact Factor <input type="checkbox"/> National/local evaluations <input type="checkbox"/> Open access <input type="checkbox"/> Publisher <input type="checkbox"/> Index <input type="checkbox"/> Publication database <input type="checkbox"/> Reaching your community of peers <input type="checkbox"/> Other

723