

Educating Business Students About Sustainability: A Bibliometric Review of Current Trends and Research Needs

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Abstract There has been substantial growth of interest in sustainability in business, management and organisational studies in recent years. This article applies Oswick's (J Manag Spirit Relig 6(1):15–25, 2009) method of bibliometric research to ascertain how this growth has been reflected in scholarly publishing, particularly as it relates to business and management education over the 20 years 1994–2013. The research has found that sustainability as a general topic in business and management studies, as evidenced by scholarly publishing, has accelerated rapidly both in terms of items published and cited. In the mid-2000s, the emphasis of books published in this area began to change from one which advocated 'sustainable development' to one which viewed sustainability as a management practice which could help businesses and society simultaneously. The literature on sustainability within the field of management and business education has been smaller, but has enjoyed a similar growth rate which accelerated sharply in the most recent 5 years of the dataset. Most of the scholarly, peer-reviewed articles analysed tend to advocate the inclusion of sustainability on business school curricula, or to demonstrate the various ways in which faculty have integrated sustainability-related principles in their teaching. A smaller amount of research has been undertaken on the learning experiences of the 'recipients' of these approaches. There is evidence of an extensive variety of approaches used by educators, but the most significant research need which presented is for more empirically driven studies on how and why business and

management students engage with the principles of sustainability.

Keywords Sustainability · Management education · Bibliometrics · Business education

Introduction

Sustainability continues to grow in importance in management, organisational and business studies (Parboteeah et al. 2012). Kelley and Nahser (2014) have recently pointed out that although the United Nation's Principles of Responsible Management Education initiative highlighted the important role of management and business educators in developing globally minded, responsible managers and business leaders, significant challenges remain to the introduction of sustainability into mainstream of management education. This article aims to contribute to this line of investigation, by analysing bibliometric data on published research in relation to (1) the growth of the sustainability discourse within business, management and organisational studies in both quantitative and qualitative terms and (2) sustainability education in the field of management. The focus of this latter point is on published research on education in sustainability in business and management studies, rather than on teaching practices. In doing so, the article attempts to provide an overview of how the field has developed over 20 years (1994–2013). It focuses on how the field of management education has engaged with this growth.

This article applies the most utilised definition of sustainability (Parr 2009) which was first offered by Gro Harlem Brundtland who saw sustainable development as "meeting the needs of the present without compromising

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the ability of future generations to meet their own needs” (World Commission on Environment and Development 1987, p. 16). Although sustainability in the management context is often discussed solely in terms of “green” issues, it does not represent the entirety of the sustainability concept. This is not to denigrate the importance of environmental ethics in relation to business and management education. Holland and Albrecht (2013) report that environmental concerns are among the most important of business ethics scholars and teachers. The environment, although important, is one component of the concept of corporate sustainability which “takes into account every dimension of the business environment: social, economic, and cultural, as well as natural” (Werbach 2009, p. 8). Werbach asserts that the four components of sustainability must be treated as “co-equal”; organisations and managers who focus on only succeeding in one or two of these areas will ultimately fail in all. Others have argued that other components (such as aesthetics or the psychological sustainability of employees or consumers) should also be taken into account (Marshall and Toffel 2005).

Although sustainability has been a central concern in fields such as geography, sociology and development studies for decades, the relatively recent interest from management studies can be seen to stem from the various social, environmental and economic crises facing the world (Currie et al. 2010), and the fact that sustainability offers managers and businesses opportunities for alleviating these crisis. The sustainability of the environment, society and economy is now a mainstream concern which is increasingly addressed in the curricula of business schools. For example, in 2007, the deans and directors of the top 50 global MBA programs in the *Financial Times* rankings reported that a majority of business schools required at least one ethics, corporate social responsibility or sustainability course be covered as part of the curriculum, and that there was a noticeable trend toward the inclusion for sustainability courses (Christensen et al. 2007). This is a significant change from 17 years previously when the inclusion of courses on social issues or business ethics was much a much lower priority on business school curricula: Bassiry (1990) found that “Only 21 % of [119] undergraduate programmes and 16 % of [80] graduate programs listed Business and Society as a core course... Even less curricular emphasis was given to course on “Business Ethics”... Among the surveyed institutions, only 5 % of the undergraduate and 9 % of the graduate programs classified Business Ethics as a core course” (Bassiry 1990, p. 803). Since that time the number of conferences (both for managers and academics), books, calls for papers and job notices which appeal to the “sustainable” appear to have proliferated.

Critics have pointed out that the existence of so many different understandings and definitions of sustainability are counterintuitive (Marshall and Toffel 2005), unsuitable for (Ferdig 2007) or inappropriate to (Parr 2009) organisational or corporate contexts. By the mid-1990s, there were over 100 definitions of the term sustainability (Marshall and Toffel 2005), which resulted in a range of stakeholders and “providers” becoming involved in the area. This creates a danger that the concept of sustainability will become confusing for managers who wish to lead responsibly. The first aim of this paper is to clarify what sustainability has come to mean in the practice and study of management education, learning and related areas. It aims to make a relevant contribution through analysing and presenting bibliometric data on the growth rate of sustainability in business and management studies. It is particularly interested in unpacking the research implications of this growth in a way that is relevant to business faculty in their roles as researchers and teachers.

Theoretically, this paper is grounded in concerns raised by Starik et al. (2010) and Whiteman et al. (2013) that mainstream business and management studies arrived somewhat late to the topic of sustainability in the early 1990s. “Since this time, especially in the past decade, attention to business sustainability has expanded significantly. However, most of this attention has yet to be integrated at any level into most business school courses and programs” (Starik et al. 2010, p. 377). Rapid growth in interest in a topic can often lead to confusion about its ontological roots and research projects. There is still a significant lacuna in relation to understandings of how management education variously “does” sustainability. This paper aims to address this by asking two related questions. The first question is “how has sustainability grown in the field of business management and organizational research?”. The second question that arises from this is “how has this growth influenced the teaching of sustainability in management education?”.

Method

Wang et al. (2012) recently discussed how scientometric research could enhance the understanding of organisational and human resource development research, particularly in relation to “knowledge structure, research topics and evolving fronts” (p. 501). The place of sustainability within management studies is one such “evolving front” and shares many characteristics with the study of workplace spirituality which has undergone something of a rapid phase of development in recent years. As with the topic of sustainability, the pace of this development was

such that it has led to a lack of clarity about the nature of the growth which the field had undergone, and how it was “done” by managers in practice (Benefiel 2003). Oswick (2009) attempted to address this gap in knowledge in the field of workplace spirituality by conducting a bibliometric analysis of published material on the topic. The aim of this type of bibliometric analysis was to produce “a longitudinal aggregation of published material to establish emergent trends” (p. 16). This meta-analysis of texts then provided the grounds for a more “micro-level” analysis of the main themes and tropes in these texts.

Oswick adopted a two-pronged approach to the bibliometric analysis stage of his research. The first of these was to utilise the British Library’s Online Public Access Catalogue (OPAC) over the last 20 years to identify books in which the word “spirituality” appeared either in the main title or sub-title, and which were listed within the “business and management” subject area. Secondly, the Social Sciences Citation Index (SSCI) was similarly analysed over a 40-year period to determine publication and citation rates. Wang et al. (2012) have claimed that listing in the SSCI “has become a synonym of quality for all social science journals” (p. 509), due to its evolution as an indexer and rater of leading peer-reviewed social science research outlets over a number of decades.

These search strategies proved effective in demonstrating the growth of the *idea* of spirituality in management discourse (both for the more general management audience in terms of monographs, and for the community of academic researchers who produce and cite peer-reviewed research articles). The next analytical stage involved a more detailed thematic analysis of books by narrowing the focus to “workplace spirituality”, than spirituality in general. The monographs which were identified as a result of this search were then isolated for more specific thematic analysis, following Boje (2001). This thematic analysis allowed Oswick to identify three dominant themes evident in the monographs and provided a picture of the “state-of-play” of a new field of practice and area of study as it was developing, and assisted in outlining possible areas where future research might also be undertaken.

The research discussed in this article aims to do the same thing for the field of sustainability in management by replicating Oswick’s method for bibliometric and thematic analysis. Both the BL OPAC and SSCI searches were undertaken using the search term “sustain*”. The “*” wildcard character was employed to ensure that the maximum level of variation in titles and sub-titles could be identified (such as “sustaining”; “sustainability”; “sustainable”, etc.). Following this, the themes of the articles that were specific to management and business education were analysed.

Results

Monographs on Sustainability

Whereas Oswick’s search of the British Library’s OPAC returned 72 books over the two decades from 1989 to 2008, a search related to sustainability in the business and management subject area over the 20 years between 1994 and 2013 returned 347 titles in total. Titles returned for years before this time-frame and were excluded from the analysis. It must be noted that this figure does not represent a straightforward “hit” report. Duplicate copies of titles which were published in other formats were excluded. Every title and abstract/description (where available) was checked to see if it referred to the current understanding of sustainability. Titles which used variants of the work “sustain” in order to reflect continuing business activities (such as “How to sustain your competitive advantage”) were deemed inappropriate to the spirit of the research and were also excluded. When the data had been analysed some 152 items were removed and the remaining 195 titles published between the beginning of 1994 and the end of December 2013 (a 20-year range) were analysed. The results appear in Table 1.

Although there is significant variation in the number of books published over the time period, it is important to

Table 1 An aggregation of books published on sustainability in the fields of business and management listed on the British Library OPAC from 1994 to 2013

Period (5 years)	Year (no. of books)	Total books
1994–2002	1994 ($n = 7$)	$n = 39$ (20 %)
	1995 ($n = 4$)	
	1996 ($n = 9$)	
	1997 ($n = 7$)	
	1998 ($n = 12$)	
1999–2003	1999 ($n = 13$)	$n = 68$ (35 %)
	2000 ($n = 15$)	
	2001 ($n = 19$)	
	2002 ($n = 10$)	
	2003 ($n = 11$)	
2004–2008	2004 ($n = 1$)	$n = 7$ (4 %)
	2005 ($n = 0$)	
	2006 ($n = 1$)	
	2007 ($n = 2$)	
	2008 ($n = 3$)	
2009–2013	2009 ($n = 4$)	$n = 81$ (42 %)
	2010 ($n = 6$)	
	2011 ($n = 24$)	
	2012 ($n = 21$)	
	2013 ($n = 26$)	

note that the scope of, and rationale for, these works has also varied. Until 2004 most of the works which treated sustainability alongside business and management tended to be written from the “sustainable development” perspective. This means that they tended to present and discuss research about the extent to which corporations were aligning their strategies with the principles of sustainability. A smaller amount of texts in the years up until 2004 were “manual-type” publications which advised readers on how to include sustainable principles in professional or managerial practices (such as accounting or operations management). With the exception of a handful of texts published post-2004, the vast majority of business and management texts viewed sustainability as a management practice that could simultaneously help businesses, communities, society and the natural environment. One example is the work of Jim Collins (2001) who differentiated “great” companies from “good” companies on the grounds that they had demonstrated sustainable, rather than fast, rates of growth.

Peer-Reviewed Research on Sustainability in Management and Business Studies on the SSCI

The SSCI permits searching of terms and words found in the title of articles alone, and within its topic (which comprises the items abstract, keyword *and* title). When the term “sustain*” was searched in the title field of the SSCI for the timeframe, 16, 178 articles were returned, of which 10,882 hits were for articles. There has been steady growth in the number of articles with “sustain*” in article titles and topics (see Table 2). In 1994, 186 articles had “sustain*” in the title. In 2013 this number had increased almost 8 times to 1483. Similarly, over half (53 %) of the articles which included “sustain*” in the articles topics appeared in the last 5 years of the analysis ($n = 29,829$ for 2009–2013).

Due to the scale of the articles returned for sustain* in both the topic and title fields, it was not possible to address the issue of over-identification in the same way that the items returned for British Library OPAC search above. It was possible to conduct this form of analysis in the portion of articles which were particularly concerned with exploring how sustainability has treated business and management education (see the section of this article titled Peer-Reviewed Publications on Sustainability in the context of Management and Business Education).

It is important, however, to address the issue of potential over-identification in relation to the 10,882 articles returned for the ‘sustain*’ title search. Of the 188 SSCI categories returned for this search, 6 of the ‘top ten’ categories (Environmental Studies, Environmental Sciences, Planning Development, Ecology, Geography, and Public

Environmental Occupational Health) represent fields of study that are traditionally associated with environmental and ecological sustainability concerns accounted for almost 64 % of the articles returned.

As a means of testing the degree to which possible over-identification of sustainability articles occurred in the general data on articles published in the SSCI on sustainability the author supplied keywords contained within the most cited SSCI articles returned in the 1994–2013 timeframe which contained ‘sustainab*’ (in order to attempt to generate a more specific set of results for analysis by removing references to ‘sustaining’ etc.) in the topic field were subjected to a co-word analysis. Co-word analysis is ‘a method of extracting words from the articles of corresponding subject fields, calculating the co-occurrence frequency of each word pair and obtaining correlations between words’ (Cho 2014, p. 388). The most cited 5650 SSCI articles with sustain* in the topic field published between 1994 and 2013 were identified and returned for analysis. This number was chosen as it represents just over 10 % of the entire number of articles returned in the SSCI which were returned for the general sustain* = topic search ($n = 56,474$). The topic field contains abstracts, titles and keywords. All articles were reviewed and 4980 articles which did not include sustainab* as a keyword were removed from the test dataset. This should not be taken to read that only 670 articles in this dataset were pertinent to the topic of sustainability. Many did discuss areas related to sustainability, but did not index it as a key word. When these 670 articles were reviewed, the ten most commonly occurring keywords which co-occurred with sustain* were: sustainable development ($n = 152$); management ($n = 60$); climate change ($n = 56$); environment ($n = 49$); indicators ($n = 44$); policy/policies ($n = 44$); governance ($n = 35$); energy ($n = 27$); sustainable tourism ($n = 26$); adaptation ($n = 22$), and; resource-based view (22).

Although this is not a comprehensive co-word analysis of the overall field of sustainability as a social scientific research field, it is presented here to indicate the central areas where sustainability-related research has been focused until now. More importantly, it highlights the need for a detailed modelling of sustainability research within the social sciences, which is discussed towards the end of this article. Oswick’s (2009) analysis did not address the fact that publications recorded in the SSCI grew in general as a result of more journals being included as the index grew over time (ThomsonReuters 2010), and more articles were published in these journals (Wang et al. 2012). As such, it is not enough to simply demonstrate that articles on sustainability are increasingly published and cited without considering whether the proportion of these articles (relative to all SSCI articles in peer-reviewed publications) has

Table 2 Journal articles on sustainability indexed in all SSCI categories 1994–2013

Year	All articles in SSCI	Number of articles with sustain* in the title (all SSCI categories)	Number of articles with sustain* in the title (all SSCI categories) as proportion of all SSCI articles	Number of articles with sustain* in the title, abstract or a keyword (all SSCI categories)	Number of articles with sustain* in the title, abstract or a keyword (all SSCI articles)	Number of articles with sustain* AND educat* in the title (all SSCI categories) as proportion of all SSCI articles	Number of articles with sustain* AND educat* in the title, abstract or a keyword (all SSCI categories)	Number of articles with sustain* AND educat* in the title, abstract or a keyword (all SSCI articles)	
1994	65,464	186	0.2841	852	1.3015	0	0.0000	61	0.093181
1995	71,864	223	0.3103	1055	1.4681	4	0.0056	79	0.10993
1996	76,899	213	0.2770	1081	1.4057	5	0.0065	92	0.119637
1997	74,122	220	0.2968	1166	1.5731	4	0.0054	102	0.137611
1998	74,103	236	0.3185	1240	1.6733	6	0.0081	124	0.167335
1999	75,984	241	0.3172	1308	1.7214	4	0.0053	111	0.146083
2000	79,164	258	0.3259	1487	1.8784	5	0.0063	155	0.195796
2001	77,902	247	0.3171	1591	2.0423	4	0.0051	136	0.174578
2002	75,734	242	0.3195	1537	2.0295	6	0.0079	152	0.200702
2003	80,310	326	0.4059	1795	2.2351	12	0.0149	165	0.205454
2004	77,169	325	0.4212	1748	2.2652	9	0.0117	188	0.243621
2005	86,736	408	0.4704	2295	2.6460	10	0.0115	213	0.245573
2006	95,499	477	0.4995	2555	2.6754	23	0.0241	266	0.278537
2007	108,014	578	0.5351	3099	2.8691	31	0.0287	334	0.309219
2008	124,240	703	0.5658	3627	2.9193	41	0.0330	430	0.346104
2009	142,035	865	0.6090	4493	3.1633	49	0.0345	548	0.38582
2010	154,081	1054	0.6841	5356	3.4761	69	0.0448	625	0.405631
2011	165,551	1207	0.7291	6064	3.6629	57	0.0344	770	0.465113
2012	174,002	1390	0.7988	6603	3.7948	68	0.0391	799	0.45919
2013	183,173	1483	0.8096	7313	3.9924	85	0.0464	931	0.508263

also grown. Bibliographic data on the proportion of SSCI articles concerned with sustainability over the timeframe of this research project is included in Tables 2 and 3 demonstrates that there has been a significant growth of general interest in sustainability within the social sciences. For example in 1997 0.2841 % of articles published in the SSCI included sustain* in their title, and 1.3015 % included sustain* as a title, abstract or included as a key word. By 2013 this proportion had increased to 0.8096 % for articles with sustain in the title, and 3.9924 % for articles with sustain* in the title, abstract or included as a key word. Although the proportion of articles with sustain* and educat* was smaller, increases in their proportion were also recorded. Articles with sustain* and educat* in the title of all SSCI categories accounted for 0 % in 1994, and this gradually increased to 0.0464 % in 2013. The proportion of articles with sustain* in the abstract, title or included as a key word increased in all but 3 years (1999, 2001 and 2012), rising from 0.093181 % in 1994 to 05.08263 % in 2013.

The SSCI index arranged these articles into numerous categories. 188 categories were returned for the “sustain*” title search, and 215 for the topic search. Perhaps unsurprisingly, and as mentioned above, the categories of environmental studies and environmental science returned the most “hits” in each field. Both the categories of “business” and “management” featured in the “top ten” of both the title and topic searches. 5 categories related to business and management were identifiable in the records in both title and topic searches. The title search results category findings were: Management ($n = 866$); Business ($n = 708$); Operations Research Management Science ($n = 164$); Business Finance ($n = 93$), and; Industrial Relations Labour ($n = 22$). The topic search results category findings were: Management ($n = 3877$); Business ($n = 2851$); Operations Research Management Science ($n = 794$); Business Finance ($n = 513$), and; Industrial Relations Labour ($n = 235$). In total, business-related articles accounted for 17.4 % of the social science articles with sustainability in the title, and 14.6 % of articles with

Table 3 Journal articles on sustainability indexed in management-related SSCI categories 1994–2013

Year	All SSCI articles	Number of articles with sustain* in the title (management SSCI categories)	Number of articles with sustain* in the title (management SSCI categories) as proportion of all SSCI articles	Number of articles with sustain* in the title, abstract or a keyword (management SSCI categories) as proportion of all SSCI articles	Number of articles with sustain* AND educat* in the title (management SSCI categories) as proportion of all SSCI articles	Number of articles with sustain* AND educat* in the title (management SSCI categories)	Number of articles with sustain* in the title, abstract or a keyword (management SSCI categories) as proportion of all SSCI articles	Number of articles with sustain* in the title, abstract or a keyword (management SSCI categories) as proportion of all SSCI articles
1994	65,464	7	0.0107	0.1023	0.0000	0	3	0.0046
1995	71,864	13	0.0181	0.1225	0.0000	0	5	0.0070
1996	76,899	19	0.0247	0.1222	0.0000	0	3	0.0039
1997	74,122	18	0.0243	0.1525	0.0000	0	4	0.0054
1998	74,103	28	0.0378	0.1552	0.0000	0	6	0.0081
1999	75,984	27	0.0355	0.1566	0.0000	0	4	0.0053
2000	79,164	28	0.0354	0.1933	0.0000	0	7	0.0088
2001	77,902	32	0.0411	0.2105	0.0000	0	7	0.0090
2002	75,734	19	0.0251	0.2113	0.0000	0	7	0.0092
2003	80,310	39	0.0486	0.2241	0.0000	0	4	0.0050
2004	77,169	34	0.0441	0.2371	0.0000	0	5	0.0065
2005	86,736	52	0.0600	0.2848	0.0000	0	8	0.0092
2006	95,499	27	0.0283	0.2513	0.0000	0	3	0.0031
2007	108,014	55	0.0509	0.2972	0.0019	2	13	0.0120
2008	124,240	75	0.0604	0.3220	0.0000	0	16	0.0129
2009	142,035	132	0.0929	0.4133	0.0014	2	22	0.0155
2010	154,081	195	0.1266	0.4550	0.0071	11	41	0.0266
2011	165,551	196	0.1184	0.4784	0.0036	6	54	0.0326
2012	174,002	245	0.1408	0.4598	0.0017	3	42	0.0241
2013	183,173	197	0.1075	0.4460	0.0011	2	31	0.0169

sustainability in the article, title and key word. These business-related articles are summarised in Table 3.

The proportion of articles in with sustain* in the title of articles listed in the management SSCI categories increased from 0.0107 % in 1994 to 0.1075 % in 2013. The increase of this proportion of articles was most noticeable between the years 2007 and 2012. Similarly the number of articles which were published between 1994 and 2013 with sustain* in the title, keyword or abstract increased each year, with the exception of 2006 and 2013. In general, sustainability has accounted for a considerable proportion of the amount of work conducted in this area, and this proportion has grown over the timeframe of this article.

Before examining how management education has engaged with sustainability, it is important to summarise and reflect on the following facts which have been elicited by this bibliometric analysis of the SSCI. Most of the business books on sustainability published in the previous two decades had an explicit focus on *sustainability* rather than *management*. The books which have been published in more recent years demonstrate a greater concern with assisting managers on how to *do* sustainability for strategic and organisational motives rather than solely for social or environmental reasons. More of these books have been published over the last 2 years of this analysis than any other time period. Of the peer-reviewed research articles on sustainability in fields related to business and management over 50 % of publications were recorded for the most recent 5 years of the analysis (2010–2012). If the above bibliometric data on sustainability as a topic within business and management studies can be taken as indication of the level of interest in the subject amongst managers and researchers, it may not be hyperbolic to suggest that the field has experienced an exponential rate of growth in recent years.

This article now turns to address the following question: what are the implications of such strong growth rates in publications and research interest in sustainability for business education and management educators?

Peer-Reviewed Publications on Sustainability in the Context of Management and Business Education

In his thematic analysis of the workplace spirituality literature, Oswick focuses on books to distil the main themes discussed by them. However, the analysis discussed in this article demonstrates a much higher degree of publication growth and citation activity in relation to sustainability amongst peer-reviewed research articles. It makes practical sense, therefore to anchor the analysis of what the literature on business and management educations “says” about this

rapidly growing portion of the literature, whilst making reference where appropriate to important monographs. The right-hand column on Table 3 (above) demonstrates that the title search returned 285 topic (title, abstract and keywords) for sustain* and educat*. These articles were then analysed as follows.

The first stage of analysing the data involved ensuring that the article set collected was complete. A title, subject, keyword and abstract search was conducted in relation to the subjects of business and management on the Business Source Complete (TM) database. This search produced 9 valid peer-reviewed articles which were not replicated in the original search results. These were added to the cohort of papers for analysis. Finally, for completeness, a search for “sustain*” in title fields was also undertaken in relation to the three journals recognised as being “core” (Beatty and Leigh 2010) management pedagogy journals (*Academy of Management Learning & Education*; *Management Learning* and *Journal of Management Education*) and in the top ten specialist business ethics journals (Albrecht et al. 2010): *Journal of Business Ethics*; *Business Ethics Quarterly*; *Business and Society*; *Business Ethics*; *A European Review*; *Business and Society Review*; *Journal of Corporate Citizenship*; *Journal of Business and Society*; *Corporate Governance: An International Review*; *Corporate Governance: The International Journal of Business and Society*; and *Business and Professional Ethics Journal*. This process added 55 articles from the management pedagogy journal and 67 from the business ethics journals. However, many of these articles referred to sustainability and education in ways which did not meet the second research objective of this paper, that is, “how has the growth of the sustainability discourse in business and management studies influenced the teaching of sustainability in the field of management education?” With this in mind, items which did not directly discuss sustainability in the context of management or business education were deselected from the dataset. This process resulted in the identification of 73 articles for analysis.

Before reporting results it is important to point out that the research for this article did not search for terms such as “environment” and “nature” for a practical reason. Although sustainability is often understood in public discourse as equating to environmental or natural sustainability, in development and management studies this is considered a limiting perspective. Environmental sustainability may be a key pillar on which sustainability is appreciated and understood, but as mentioned above, nature is just one component amongst others required for sustainability (Werbach 2009; Marshall and Toffel 2005).

73 articles were recovered which discussed sustainability in the context of management and business education. This amount represents 1.15 % of the total number of

research publications in peer-reviewed journals with sustain* as a topic over the timeframe of the research. The growth rate in peer-reviewed publications mirrors that of the general publication rate reported in Tables 2 and 3. 13.7 % of the articles selected for analysis (which discuss business/management education and sustainability) were published between 1994 and 2008; 86.3. % were published in the 5 years between 2009 and 2013. The intensification of research activity on sustainability in business and management research has been mirrored in the literature which focuses on business/management education, albeit at a smaller scale.

It is important to address an important ‘structural’ point as to the reasons why a smaller amount of research publications on sustainability education in business has been published. Most academic researchers are incentivised to publish in higher impact journals as determined by various national and international ranking systems. Whereas sustainability research is often published in highly ranked journals, research on educational practices in business fields is less likely to make its way to the highest tiers of journal quality rankings. For example, the Chartered Association of Business School’s *Academic Journal Guide* (2015) affords only one management education journal (*Academy of Management Learning & Education*) a ranking of 4, and one (*Management Learning*) a ranking of 3. By comparison, 4 journals in the field of Accounting (*Accounting Review*, *Accounting*, *Organizations and Society*, *Journal of Accounting and Economics*, and *Journal of Accounting Research*), all receive 4* ratings denoting recognition as ‘world-wide exemplars of excellence’ (p. 7). No 4* ranking is afforded to any journal in the *Management Development and Education* division.

The “top five” journals where sustainability was discussed in the context of business/management education were: *Journal of Management Education* ($n = 18$, 24.7 %), *Academy of Management Learning & Education* ($n = 17$, 23.3 %), *Journal of Management & Organization* ($n = 7$, 9.6 %), the *Journal of Business Ethics* ($n = 6$, 8.2 %) and *Journal of Corporate Citizenship* ($n = 6$, 8.2 %). It is important to point out, however, that this number was substantially bolstered by three journals publishing special issues related to the topic of sustainability in recent years. These were: *Academy of Management Learning & Education* (2010—volume 9, issue 3); *Journal of Management Education* (2009—volume 33, issue 3) and *Journal of Management & Organization* (2011—volume 17, issue 5). *Journal of Business Ethics* was the first of the “top five” journals to publish articles on sustainability and business education, and with the exception of *Journal of Management Education* (which published a relevant article in 2007) was the only one to publish articles ($n = 3$) prior to the high-growth period of 2009–2013.

This bibliometric analysis inquires into the peer-reviewed publications on sustainability in the context of business and management education. This article also asks who the development targets of this work were. In other words it asks “who are the intended beneficiaries of the content of these articles?” The majority ($n = 32$, 43.8 %) of these articles were written for business education *providers* (particularly at university or business school level), rather than learners. The second largest groups of beneficiaries ($n = 31$, 42.5 %) were academic researchers or teachers who were offered conceptual models or frameworks for integrating their teaching with principles of sustainability. Significantly less attention was afforded to students ($n = 9$, 12.3 %). Over 86 % of articles advocated means by which current educational practices could be improved. This demonstrates that the majority of peer-reviewed articles were less likely to make the significant contributions which highly ranked journals publish and reinforces the point made earlier about the lack of a structural incentive for publishing educational research in the field of business/management sustainability.

In many ways, the field of sustainability in the context of management education is typical of a field in development, as evidenced by the diverse array of methods it uses to teach management students and executives, and to research pedagogical practice. These methods are summarised in Table 4. When the central themes of these articles were analysed it became clear that they tend to adopt one of three different positions (*advocating*, *demonstrating* or *investigating*) in how they deal with integrating sustainability with management or business education. 42.5 % *advocate* greater inclusion of sustainability on business school curricula. This is often carried out from an ethical perspective that challenges the conditions which led to the global financial crisis. 37 % *demonstrate* various methods which management educators use to teach sustainability. The smallest proportion of the articles returned in this search (15 %) *investigates* how sustainability is “done” in business/management education. It is interesting that this theme accounts for the smallest section of the literature reviewed. Although the range of research methods applied is, naturally, smaller, the research methods used in this group of articles is also quite diverse and ranges across both qualitative and quantitative domains.

Limitations

This research is the first bibliometric analysis of sustainability in the context of the business and management peer-reviewed research literature. It represents an initial foray into a burgeoning field of inquiry, so it is important to highlight the limitations of the research. Firstly, as pointed

Table 4 Methods used in each thematic category

Theme of article	Advocating sustainability on business schools curricula	Demonstrating sustainability in business and management education (teaching approaches discussed)	Investigating sustainability in business & management education (research approaches discussed)
Methods	N/A	Action learning and/or action research; cura personalis; social entrepreneurship; organisational learning; “classroom-based” exercises (on topics such as triple-bottom line accounting, strategic decision-making and negotiating), service learning; taught modules on specific subjects, course designs (and advice on how to integrate these with module designs with other disciplines); reviews; training needs analysis; virtual learning networks; systems thinking; reflective practice; critical thinking; environmental assessment; holistic learning, development and pedagogical design; team-based learning; problem-based learning; mixed pedagogical methods, inquiry-based learning; simulations; experiential learning; sectoral analysis; economic analysis; case studies; personal accounts; site visits, and; cinematic reviews	Surveys/questionnaires; literature reviews and synthesis; ethnography; mixed methods; inductive research; interviews; analyses of module feedback; reflective practice reviews; action research; case studies; narrative research and documentary analysis

out above, the terms “nature” and “environment” were excluded to assist in the development of a more precise analysis of the sustainability discourse. However, given that there are now more calls for research which investigate forms of corporate and organisational sustainability which transcend “planetary ecological” boundaries (e.g. Whiteman et al. 2013), the exclusion of terms which are closely associated with the “environmental” pillar of sustainability should be re-assessed by similar future research.

A second limitation is the extent to which the research in this paper stems from an English-language perspective. Although many articles state that business schools only really began to engage with sustainability as an issue around 1990, sustainability-related business offerings (courses, texts etc.) were available at least a decade earlier in non-anglophone countries. Additionally, many “non-western” cultures often have radically different perspectives on the relationship of humans with the natural world, and with each other, which may obviate the need for specific forms of sustainability education. This limitation could be addressed by developing a cross-national, multi-lingual project where scholars undertake bibliometric research on non-English language databases. Although English is the *lingua franca* of science and scholarship, acknowledging the contributions of scholarly communities at national level is in keeping with the “spirit” of sustainability as a global project.

This research has demonstrated that the amount of material on sustainability that has been published has increased rapidly in recent years. Some theorists have

confused sustainability with other areas of investigation in the field business ethics research. Sustainability has been associated with business and the environment, CSR and even corporate governance. As such, further bibliometric investigations could address this point to ensure that the most complete dataset possible is returned for analysis.

Due to the strong overall growth rate in peer-reviewed publications on the topic of sustainability within business and management studies in general over the last 20 or so years, there is an opportunity to conduct more detailed bibliometric studies on this emergent field. Although it is important to use this opportunity to clarify the sub-fields within the research which have developed most and where more work is needed, opportunities also exist to model the intellectual structure of this important domain in order to assist in understanding how the various knowledge domains within sustainability studies can inform each other (Cho 2014).

In the 1990s, most articles which appeared in peer-reviewed research journals on the topic of sustainability tended to be written from a sustainable development position, rather than a management position. The management academy’s engagement with the topic has resulted in a noticeable increase in the quality of writing and conceptualisation that is now happening in the broader management, organisation, and business studies field. The engagement of management scholars, in all fields, with the principles of sustainability has been energetic and has grown quickly. Most of the articles produced to date, however, focus on *championing* the cause of sustainability

in management education or on *demonstrating* the various pedagogical methods and approaches which have been used. Only 15 (20.5 %) of the 73 articles analysed collected or reviewed empirical data. Nine (12.3 %) were purely conceptual or advocated theoretical considerations. Thirty (41.1 %) described a pedagogical model, curriculum innovation or teaching approach. Nineteen (26 %) were opinion pieces, editorials or commentaries with no empirical basis or theoretical discussion. There is, therefore, a significant void with regard to our understanding of the experiences of students who engage with sustainability as part of their management or business education, and where such work is done, it sometimes is conducted on student evaluations. Although such work is important, there is a requirement that we develop a deeper understanding how sustainability can be embedded in teaching approaches with the broader field of business ethics instruction, and in other disciplines. This would suggest a need for (1) a greater understanding of the range and extent of sustainability-related teaching practices in business and management education and (2) more longitudinal research on business students experience with sustainability and richer data on how they negotiate the changes such forms of sustainable business education requires of participants. Writers such as Bebbington (2000) and Banerjee (2011) highlight how the success of implementing changes which support the principles of sustainability rest on broader systemic change. Given that students, as future managers, have the potential to impact the development of products and services, they hold potentially enormous power to make sure that sustainability “happens” and is a realistic option for the consumers of the products they will produce and the users of the services they will provide.

Conclusion

The rate at which research on sustainability in the field of management, organisational and business studies has been published in peer-reviewed research journals has increased sharply in recent years. Although published research on sustainability which is specific to management education represents a small proportion of this body of work, it has also experienced a similar growth rate. A large proportion of this published work either advocates greater levels of coverage of sustainability in business school curricula or demonstrates the various ways in which business school faculty have attempted to do this work. There is a broad array of pedagogical or developmental approaches recorded in the peer-reviewed research literature, but extant research on the results of these initiatives is rare. As such, this article asserts that there is a strong and diverse body of *practice* in relation to the field of sustainability and

management education, but this is not supported by a specific *research culture*. Additionally, most of the research appears to attempt to address management education *providers* rather than students (recipients). Sustainability and management education research needs to enhance our understanding of how students engage with sustainability-oriented management education programmes in ways which are conscious or the lived cultural realities of participants in such initiatives.

With the topic of sustainability increasing in interest to established areas of management practice and organisational scholarship, the research discussed in this article suggests that the field of management education can make a solid contribution to this emerging discourse. Re-focusing attention on how students and organisations actually engage with the concept of sustainability in their work is required to ensure that the field can be at the vanguard of this growing trend.

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