What do citation patterns reveal about the outdoor education field? A snapshot 2000–2013

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Abstract

This study considered what insights into outdoor education (OE) research and scholarship could be gleaned from citation indices and patterns. Citation *indices* have long been used as ranking tools in the physical sciences, and more recently have been used in humanities and social sciences. High citation measures indicate high research impact, although the converse is not necessarily true because research can have impact unrelated to citations, especially in a small practical field such as OE, and citation indices cannot be used for cross-discipline comparisons without considering variations in citation patterns between fields or disciplines. Citation data can also be used for purposes other than ranking. One aim of this article is to consider what OE citation *patterns* indicate about the distinctiveness of OE as a field. We wanted to use citation data to inform our understanding, as researchers, of the nature and structure of OE discourse. In particular, we made use of citation tools to look at not only which OE work had been cited but also where citation impact occurred. The study examined the most-cited OE research and scholarship published from 2000 to 2013. We attempted to answer the following questions: (1) What do citation patterns indicate about OE research impact outside the field? (2) Does where OE research is published predict where its citation impact, if any, will be? (3) Do citation patterns point to the existence of a single OE literature, or several? (4) Do citation impacts provide insight into how, if at all, the OE field progresses? Using Google Scholar data, Publish or Perish software, and searches for "outdoor education," we obtained 1,446 articles or other sources. Using Zotero software, we reviewed and analysed these articles and works. We found strong support for an argument that OE discourse constituted a distinct research community clustered around the *Australian Journal of Outdoor Education* (now the *Journal of Outdoor and Environmental Education*), the *Journal of Adventure Education and Outdoor Learning,* and the *Journal of Experiential Education.* Most published OE work is never cited, and a small number of well-cited works form patterns of citation. We were surprised by the number of theses in the citing works, and found that with the exception of a few articles any impact of OE research and scholarship outside of the OE journals, theses, or OE conferences, is highly diffuse.

Keywords: outdoor education literature, literature reviews, bibliometrics, experiential education

Introduction

The expanding reach and availability of citation data, particularly due to Google Scholar (GS), have made citation metrics — and patterns — more accessible in the social sciences and humanities and more meaningful, provided differences between disciplines or fields are understood (Harzing, 2013). Citation measurement, long established in the physical sciences, has only recently become mainstream in the social sciences and humanities, in part due to the advent of GS. In some fields and in some institutions citation measures are used to infer the impact of a particular journal or individual academic (LSE Public Policy Group, 2011), but citation data can also serve other purposes. Whether or not citation metrics are important to academic careers in OE, citation data can also be used to help understand the nature of academic discourse in the field, which is the aim of this article.

There is considerable literature on citation metrics. We have relied on Harzing's (2013) work, which has a particular focus on the use of GS data in smaller or marginal fields of study. GS is important because in a field like OE it picks up any and every citation it can find, as distinct from indexing citations only in a specific set of journals. We refer readers interested in the more arcane aspects of citation metrics to Harzing (2013) and the literature she cites.

While we expect this article will have some relevance for those interested in the application of citation metrics in ranking exercises, our primary aim was to use citation data and tools to better understand the OE literature. In trying to understand the ebb and flow of ideas in the OE field, citation patterns do not reveal which ideas are most significant — that requires a review of both the cited works and the citations in context — but they do indicate where the most influential ideas might be found.

To the best of our knowledge, there has been no previous research on citation patterns in OE journals or publications. There have been previous reviews of OE research (see, for example, McKenzie, 2000 or Rickinson et al., 2004), and Thomas, Potter, and Allison (2009) have published a broad overview of the content of the *Australian Journal of Outdoor Education* (AJOE),[1] the *Journal of Adventure Education and Outdoor Learning* (JAEOL), and the *Journal of Experiential Education* (JEE).

The most basic citation measure is a count of the number of times a publication (article, paper, book, or thesis) has been cited in the scholarly or

research literature. A well-cited publication will accrue citations over time, and in some cases could continue to be regularly cited many years after it was first published. More complex citation measures can be applied if assessing the impact of a particular journal or a particular academic. One such measure is the h-index: a widely used and robust measure of the impact of an opus, of either an individual or a journal. The h-index is defined such that an author (or journal) with an h-index of 16 (for example) has 16 publications with 16 or more citations.[2] Unlike a publication count, the h-index discounts papers that are not cited. Unlike a simple tally of citations, the h-index is undistorted by one or two very highly cited publications — an increase in h-index requires both more citations and more publications (Harzing, 2013). H-index is sufficient for the purposes of this article but in ranking exercises alternative indices can be used to give more credit to very highly cited papers, to adjust for an inherent h-index bias against junior academics (a senior academic could have a large and growing h-index without having produced any worthwhile research for a decade), and to adjust for multiple authorship (Harzing, 2013). Some measures adjust for self-citation but accounting for self-citation embedded in multiple authorship is complex, and according to Harzing (2013) citation ranking is rarely altered as a result. Most authors follow lines of enquiry and naturally cite their previous work, and except in fields where authors can contribute to a large number of multiple authored papers annually, few authors publish enough for self-citation to be a distortion.

Citation indices can be applied to individual academics or to journals. Table 1 provides a comparison of the h-index of the three main OE journals with *Environmental Education Research* (EER) and *Annals of Tourism Research* (ATR). The OE field is relatively small. Thus, when the snapshot was taken AJOE had published 17 post-2000 articles with 17 or more citations, while EER had published 54 post-2000 articles with 54 or more citations in the same period (only one AJOE article had more than 54 citations).

Table 1. *OE-Related Journals Compared With Journals From Environmental Education and Tourism, Citations to Articles Published From 2000–2013*

	Number of papers	**Number of citations**	**h-index**
AJOE*	107	967	17
JAEOL	197	1,484	21
JEE	457	4,325	33
EER	>1,000	15,485	54
ATR	>1,000	54,590	127

Note: *AJOE articles were not all captured by GS in 2013. Including three stray well-cited articles (see Table 11) would bring the h-index to 20.

Citation counts are a reliable indicator of impact (Harzing, 2013) although a little-cited work could have impact in other ways.

Citation metrics cannot generally be compared between disciplines or fields (Harzing, 2010). Compared to larger fields, the OE field is characterised by a small number of journals published infrequently, which means citations generally accrue slowly and in small numbers. The only exception would be if an OE work attracted large numbers of citations from outside the field. It is problematic to compare citations across fields because the overall size of the field affects potential numbers of citations as do publication rates — citations to any article are limited by the number of potentially citing articles and how quickly they appear. Another way to put the overall size (and potential impact) of OE in perspective is to compare it to a single paper or the opus of a single academic. One very well-cited article in the environmental education literature (Dunlap & Van Liere, 2008, orig 1978) has 2,539 citations[3] at the time of writing, which is more than the total number of citations to all articles published by the JAEOL from 2000. An OE article could not obtain that number of citations even if every article from 2000 in JAEOL, the JEE, and the AJOE cited it. At the time of writing, sociologist Frank Furedi, sometimes cited in OE work, had an h-index of 31 and total citations of 6,744. Differences in rates, patterns, and quantity of citations across fields reflect, at least in part, the size of each field and their respective histories.

This study examined the most-cited OE research and scholarship published from 2000 to 2013. It considered the following questions: (1) What do citation patterns indicate about OE research impact outside the field? (2) Does where OE research is published predict where its impact, if any, will be? (3) Do citation patterns point to the existence of a single OE literature or several? (4) Do citation impacts provide insight into how, if at all, the OE field progresses?

Method

We recorded a snapshot (November 2013) of citations and citation data to OE articles published from 2000, using Publish or Perish software and GS data. GS does not permit searches based on the number of citations, and will not sort by citation, but does provide citation numbers and a hyperlink to the set of citing articles. Publish or Perish searches comprehensively using GS advanced search functions, calculates the h-index and other metrics, and allows sorting and

filtering. We collected citations to articles in the JAEOL, JEE, AJOE, *New Zealand Journal of Outdoor Education* (NZJOE), *Journal of Outdoor Recreation, Education, and Leadership* (JOREL), and the papers from the *Coalition for Education in the Outdoors* (CEO) conferences. We also conducted a search for articles with "outdoor education" in the title, from any source (OE), and recorded citations and citation data for those.

We further examined the citations to the most-cited articles in each publication. For JAEOL, AJOE, and OE we chose the 10 most-cited papers. In the case of JEE we chose the 10 most-cited articles not on service learning or cooperative learning in a university. Overall, JEE papers had more cites than JAEOL papers, which in turn had more than AJOE, with the tenth most-cited papers having 58, 30, and 22 cites respectively. In the case of OE, we chose the 10 most-cited papers not already included. That search found AJOE articles that GS had not recorded as AJOE papers. We have noted those papers as AJOE articles, but we have included them as "OE" rather than AJOE because that is how GS found them and we did not want to arbitrarily correct some GS deficiencies when it was beyond our capacity to correct them all. We were particularly interested in citations of AJOE papers, but it should be borne in mind that a different project, which considered papers with x or more citations regardless of where published, would have included relatively fewer AJOE papers and many more JEE papers.

We located each of the selected articles in GS, then used the "cited by" link to find all citing articles. We captured the results of those searches using Zotero. Zotero downloads GS metadata into a searchable database with an iTunes-like interface to build collections and sub-collections. We needed to capture the search results because citation data changes continuously as citing works are published and GS discovers them.

The CEO, JOREL, and NZJOE had relatively few citations so instead of the 10 most cited we considered any work cited eight or more times. In order to find highly cited articles published elsewhere, we conducted a general search for the phrase "outdoor education" in the title and included the 10 most-cited publications not already included (OE).

This process allowed us to examine not only the most-cited OE work, but also to analyse the citing works. We collected 1,446 articles or other sources which GS had recorded citing one or more of the most-cited articles. We then checked and tidied the metadata in Zotero because GS data is imperfect. We found books listed as journals published by ProQuest and sources listed as journal articles with no journal name recorded. In each case, we examined either the article or the webpage referring to it to correct the metadata. Most of the adjustments we made involved reclassifying books or journal articles as theses. At the end of that process there remained approximately 20 articles with uncertain bibliographic information, and a similar number not in English which we did not check. We adjusted metadata in Zotero but did not revisit and manually edit the search results recorded in Publish or Perish.

Publish or Perish software provided a suite of citation metrics for each citation search, such as overall number of papers matching the search criteria (up to 1,000), citation indices, citations per year for each paper, and total number of citations. Zotero allowed us to review and analyse the *citing* articles and works.

We restricted our study to publications dated 2000 or later. The figure was somewhat arbitrary, but too recent a date does not give enough time for citation numbers to build, and too early a date would generate a study more weighted to past publications that have had more time to accrue citations.

We selected papers based on overall number of citations. This produces a bias towards earlier publications, which have had time to accrue more citations but is consistent with our aim to examine the impact, rather than potential impact, of work published from 2000.[4] Table 2 shows how the selection of articles for JAEOL would change if the criterion was "most cites per year" rather than "most cites." Five articles

Table 2. *JAEOL Most Cites Per Year Articles Published 2000–2013 (November 11, 2013)*

Article	Cites/year	Rank by total citations 1–10
(Neill & Dias, 2001)	9.77	1
(Brookes, 2003a)	5.82	2
(Lugg, 2007)	5.00	7
(Sandell & Öhman, 2013)	5.00	-
(Brookes, 2003b)	4.27	3
(Harrison, 2010)	4.25	-
(Sandseter, 2009)	4.20	-
(Mygind, 2009)	4.14	-
(Mygind, 2007)	3.80	-
(Russell, 2006)	3.75	10

would remain in the list with two at different ranks, and five different articles would be included. Four of the new inclusions would be by Scandinavian authors.

We took snapshots of citations in early November 2013 (GS collects citations automatically and continuously) and archived Publish or Perish results and statistics in spreadsheets. Using the GS search for citing articles, we harvested citing articles and metadata using Zotero into separate files for each cited article (with one exception, discussed below).

Results

As in most fields, in OE citations are concentrated in the most-cited articles. Table 3 shows the percentage of citations attributed to the 10 most-cited articles in JAEOL, AJOE, and JEE, which accounted for 32%, 37%, and 18% of the total citations to articles in each journal, respectively, for articles published 2000–2013. For both JEE and JAEOL, the mode (most common) number of citations is zero. AJOE was a special case because AJOE articles at the time did not consistently have a unique URL, and in many instances are only found by GS because they have been cited. Zero citation impact, which most articles have, does not mean zero impact, but one would have to seek evidence for impact elsewhere; for example, an article might have impact in the field or might be used as a teaching resource.

Most articles and theses published in the OE field are never cited. The remainder of this article focuses on the relatively small number of published works that appear, based on citation counts, to have had a relatively high impact.

Impacts of the most-cited works from 2000–2013

Removing duplicates (due to a work citing more than one of the most-cited articles) left 1,446 works that cited at least one of the 50 selected articles. A little over 50% of the citing works were journal articles. The number of theses surprised us: 445, or 31% of all citations were in theses. Books or book sections comprised 6% of citing works.

We were also surprised by the modest percentage of citations from articles in OE journals — 27% of all citations, with another 8% from environmental education journals. The remainder of the journal citations were from a wide range of fields and a large number of journals — we counted over 300 different titles (an exact figure is difficult to determine because GS data is incomplete on some citing works and because we did not attempt to translate non English citations to confirm the source was a journal). Scanning the theses' titles suggested most dissertations contributing to the citations were not specifically focussed on OE — 14% of the theses had the word "outdoor" in the title.

It was beyond the scope of this project to examine the content of citing articles in detail, but Table 4 shows the frequencies of selected words in the titles of all citing works. The relative frequencies accorded with our general impressions of the field, but the overall low frequency of even the most common supports the observation that overall citation impact from the OE field is so dispersed that impact is possibly the wrong word. While we do not doubt that the impact of certain

Table 3. *OE Publications (2000–2013) Citations, H-Index, Percentage of Citations Attributed to 10 Most-Cited Papers*

	Total citations	h-index	Papers	% of citations in 10 most-cited papers	% of papers	Median cites/paper	Mode cites/paper
JAEOL	1,484	21	197	32%	5%	3	0
AJOE*	967	17	107	37%	9%	n/a	n/a
JEE**	4,544	34	460	18%	2%	3	0
NZJOE from 02	85	5	49	67%	20%	1	0
JOREL from 09	35	3	115	63%	9%	0	0
CEO conference	175	5	87	38%	11%	0	0

Note: *GS misses AJOE papers that do not have a unique URL, or which have incomplete metadata, especially if not cited. **Includes papers unrelated to OE. Assuming only half the JEE articles are OE-related, the % of citations would be 36.

individual papers would be coherent, overall numbers of citations to OE work outside the field is greater than we expected but also more scattered than we expected.

Table 4. *Words in Titles of Citing Works*

In title	Number	% of all citations
Educat . . .	440	30%
Outdoor	269	19%
Environment . . .	169	12%
Adventur . . .	150	10%
Outdoor Education	107	7%
Place	98	7%
Therap . . .	78	5%
Cultur . . .	57	4%
Social	55	4%
Criti . . .	34	2%
Camp	33	2%
Risk	21	1%
Safe	3	<1%

Separating citations by peers in OE journals from other citations — does the OE field progress?

We were intrigued by the relatively small citation impact within the OE field that well-cited OE articles could have. To understand this further, we looked at citations *to* the 10 most-cited articles in JAEOL, AJOE, and JEE *in* each of those journals (Table 5, Table 6, and Table 7 — see pages 17 and 18); we called the sum of the three contributions "OE impact," representing citation by peers in OE journals.

The proportion of impact attributable to the three OE journals, which is arguably an indication of discursive connections in the OE field, varied greatly between articles. Only some of the well-cited articles were well-cited *in* the OE journals. Five articles owed 5% or less of their citations to the OE journals. Only four had 40% or more, all but one in JAEOL.

Can an academic field progress if research and scholarship does not build on, or connect with the work of those who have gone before? We found only 15 articles that had been cited 10 or more times — not a large number — by peers in the OE journals. We cannot conclude anything from this fact alone, but it left the impression of OE discourse consisting of many contributions offered but not taken up.

Do the three OE journals represent three separate discourses?

We wondered to what extent the three OE journals served a single academic community. We thought that cross-citation between the three journals would be evidence of that, although the small numbers of citations in the OE journals, even to the most-cited work, rendered this part of our study somewhat sketchy.

Citations from OE journals to JAEOL articles were mostly from JAEOL itself (Table 5), and citations from OE journals to JEE were mostly from JEE itself (Table 7). In contrast, citations from AJOE contributed only weakly to citations of AJOE articles — AJOE articles were cited by the OE journals in very similar proportions to JAEOL articles, with both citations by JAEOL and JEE articles outnumbering those by AJOE articles. We think this suggests that AJOE occupied a similar, but more modest, place in OE discourse to JAEOL.

Overall, cross-citation between the journals was modest. Table 8 shows how many of the OE journal articles earned four or more citations from each of the other journals. Only about half of the most-cited articles in each of the three journals received more than three citations from either of the other two journals. About one third of all citations to articles in the three journals 2000–2013 were captured by this study. We think it is unlikely that the pattern of citation to the less-cited articles would show a higher level of cross-journal citation overall.

Table 8. *Number of Included Articles Published in One of the Three Journals (Rows) With Four or More Citations in One of the Other Journals (Columns)*

	Articles cited more than four times in		
	JAEOL	AJOE	JEE
JAEOL	9	2	4
AJOE	6	2	1
JEE	4	1	8

Table 5. *JAEOL Most-Cited Articles Published 2000–2013*

Article	Cites	JAEOL	AJOE	JEE	OE impact	
(Neill & Dias, 2001)	125	4	2	4	10	8%
(Brookes, 2003a)	63	13	4	4	21	33%
(Brookes, 2003b)	47	11	3	1	15	32%
(Loynes, 2002)	41	10	1	3	14	34%
(Davidson, 2001)	38	1	-	1	2	5%
(Nicol, 2003)	37	8	5	4	17	46%
(Lugg, 2007)	35	4	1	2	7	20%
(Brown, 2002)	35	4	1	9	14	40%
(Nicol, 2002)	31	9	3	1	13	42%
(Russell, 2006)	30	4	-	3	7	23%
Totals	**482**	**68**	**20**	**32**	**120**	**25%**
% of OE impact in each journal		**57%**	**17%**	**27%**		

Note: OE impact is % of citations by articles in the three OE journals.

Table 6. *AJOE Most-Cited Articles Published 2000–2013*

Article	Cites	JAEOL	AJOE	JEE	OE impact	
(M. D. McKenzie, 2000)	122	10	2	16	28	23%
(Stewart, 2004)	37	8	5	-	13	35%
(Martin, 2004a)	33	4	1	2	7	21%
(Pryor, Carpenter, & Townsend, 2012)	29	-	-	1	1	3%
(Hovelynck, 2001)	26	3	-	2	5	19%
(Zink & Boyes, 2006)	25	4	-	-	4	16%
(Lugg, 2004)	25	6	4	2	12	48%
(Brown, 2008)	24	6	1	1	8	33%
(Brymer & Gray, 2006)	22	1	1	-	2	9%
(Davis, Rea, & Waite, 2006)	22	1	-	-	1	5%
Totals	**365**	**43**	**14**	**24**	**81**	**22%**
% of OE impact in each journal		**53%**	**17%**	**30%**		

Note: Due to GS metadata gaps, three AJOE articles are included in Table 10.

Table 7. *JEE Most-Cited Articles Published 2000–2013, Excluding Three Clearly Not OE-Related*

	Cites	JAEOL	AJOE	JEE	OE impact	
(M. McKenzie, 2003)	112	10	-	15	25	22%
(Russell, 2001)	105	4	-	8	12	11%
(Estes, 2004)	78	2	1	4	7	9%
(Quay, 2003)	77	2	2	3	7	9%
(Allison & Pomeroy, 2000)	77	4	4	9	17	22%
(Breunig, 2005)	73	-	-	4	4	5%
(Hubbs & Brand, 2005)	66	-	-	2	2	3%
(Goldenberg, McAvoy, & Klenosky, 2005)	62	2	-	9	11	18%
(Garst, Scheider, & Baker, 2001)	60	1	-	6	7	12%
(Baldwin, Persing, & Magnuson, 2004)	58	4	-	7	11	19%
Totals	**768**	**29**	**7**	**67**	**103**	**13%**
% of OE impact in each journal		**28%**	**7%**	**65%**		

Note: Table represents 2% of JEE articles from 2000 and 18% of citations to JEE articles.

The cross-citation rates (Table 8, p. 16) and the percentage of OE impact of a given paper in the other two journals (Table 5, Table 6, and Table 7) might partly be explained by paradigmatic (methodological) differences between North America and the United Kingdom (UK)/Europe. In the management literature, Bengtsson, Elg, and Lind (1997) argued that a gap existed between European and North American approaches to research that reflected methodological differences. In analysing the logic used by North American reviewers of European papers, Bengtsson et al. (1997) observed that reviewers applied nomothetic criteria (as if all manuscripts were statistical studies of populations) when evaluating idiographic research (case studies, historical studies, and scholarly discussion). They noted that reviewer reliance on nomothetic criteria could have been largely due to cultural factors shaping approaches to research, especially in the United States (US) where positivist research paradigms had had a dominant role for a long time. What was true of management literature in 1997 might not be true of the OE literature post-2000, but we surmise that the nomothetic/idiographic distinction might have some explanatory power in a study that examined the OE discourse, but that is not something we could determine from our examination of the metadata.

Although our analysis of citations did not include author nationality, Thomas et al. (2009) observed that between 1998 and 2007 in the JEE 79% of authors were affiliated with the US with 4% from UK/Europe. In the JAEOL between 2000 and 2007, 43% of authors were affiliated with the UK/Europe and 29% from the US (Table 9, Table 10). Rates of citation are linked to rates of publication, which as Bengtsson et al. (1997) argue, are shaped by sociocultural influences such as methodological-paradigmatic dispositions of editors and reviewers.

Rather than revealing distinct discourses clustered nationally, or other structures, we found patterns of citations derived from relatively few papers and that overall numbers of citations within and between the main OE journals were small. Only an examination of the actual cross-journal citations would determine whether such citations were passing mentions or more detailed engagements.

Table 9. *Author Nationality for Papers in the JAEOL, AJOE, and JEE for Given Time Periods (Adapted From Thomas et al., 2009)*

	JAEOL 2000-2007*	**AJOE** 1998-2007	**JEE** 1998-2007
Total papers	70	106	167
Author affiliation^	**(% of total)**	**(% of total)**	**(% of total)**
Asia/Middle East	3	2	1
Australia	13	72	5
Canada	6	4	8
Europe	9	2	2
New Zealand	7	8	2
UK	34	8	2
USA	29	4	79

Note: *JAEOL commenced in 2000, hence different time periods. ^Papers with multiple authors from different countries were coded on affiliation of first author.

Table 10. *Articles With "Outdoor Education" in Titles, 2000–2013, Excluding Those Counted Elsewhere*

	Cites	**JAEOL**	**AJOE**	**JEE**	**OE impact**
(Woodhouse & Knapp, 2000)	122	2	-	-	2
(Brookes, 2002)	85	15	3	3	21
(Gilbertson, 2006)	60	2	1	5	8
(Moseley, Reinke, & Bookout, 2002)	56	-	-	-	0
(Bogner, 2002)	47	-	-	-	0
(Wattchow & Brown, 2011)	43	8	3	3	14
(Adkins & Simmons, 2002)	40	-	-	1	1
(P. G. Payne, 2002)*	39	5	4	4	13
(Brookes, 2004)*	31	9	-	2	11
(P. Payne & Wattchow, 2008)*	30	3	1	-	4
Totals	**553**	**44**	**12**	**18**	**74**
% of impact in OE journals /OE field		**8%**	**2%**	**3%**	**13%**

Note: *AJOE articles.

OE discourse and impacts outside JAEOL, AJOE, and JEE

In order to locate publications outside the three main journals, we searched for articles in any publication with "outdoor education" in the title. In order to obtain the 10 in Table 10, 11 articles already included were passed over. The final 10 included three AJOE articles from university websites that did not include the journal name in the metadata. (Since all of the tables were limited by what GS advanced search would find, we left these articles where GS found them.) No fourth or fifth important journal for OE discourse emerged from this search.

We checked "outdoor learning" as a search term, which picked up Rickinson et al. (2004) 264 cites, Dillon et al. (2006) 129 cites, and some other articles not already considered that were more focussed on outside the classroom activities, as distinct from "the outdoors." Although OE has fuzzy boundaries, we decided that to move away from the definition of OE determined by our interest in AJOE, JAEOL, and JEE would require a different study.

We applied our search to the NZJOE, proceedings of the CEO, proceedings of the International Outdoor Education Research Conference (IOERC), and the JOREL. Only two articles had been cited 20 or more times, so rather than consider the 10 most cited we selected any article with eight or more citations (Table 11).

Certainly, monographs or articles with an OE focus published in the wider educational or other literature can be well-cited (Table 10), but publication in conference proceedings or OE journals other than AJOE, JAEOL, or JEE appears to be associated with modest numbers of citations at best.

Table 11. *Post-2000 Articles Cited Eight or More Times in the NZJOE, CEO, or IOERC. No Such Articles Were Found for the JOREL (Post-2009 Only)*

Article	Publication	Cites
(Zink, 2003)	NZJOE	12
(Irwin, 2008)	NZJOE	8
(Neill, 2002)	CEO	67
(Bunting & Donley, 2002)	CEO	20
(Sibthorp, Paisley, Furman, & Gookin, 2008a)	CEO	10
(Sibthorp, Paisley, Gookin, & Furman, 2008b)	CEO	9
(Gough & Sellers, 2004)	IOERC	11
(Jones, 2004)	IOERC	10
(Wattchow, 2004)	IOERC	10
(Hales & Watkins, 2004)	IOERC	9
(Martin, 2004b)	IOERC	8

Concluding discussion

The patterns of OE research citations that we have examined involved a mixture of expected and somewhat surprising results. The three journals, JAOEL, AJOE, and JEE, are the primary vehicles for publication of well-cited OE research. No fourth or fifth important OE journal became apparent through our analysis. Although AJOE was a smaller journal, it published at least its share of well-cited articles, commensurate with its size. Citation within and between the three main journals is modest and largely centred on a few articles. Theses represented 31% of all citations, indicating that postgraduate research is an important aspect of the growing field. However, a high proportion of theses were from outside OE. The vast majority of papers receive zero citations, many citations are by theses that are not themselves cited, or citations by journals that might only cite one or two OE articles in a decade.

Citation impact within, or outside, the field varied greatly between well-cited articles. Bearing in mind that there have been very influential books and articles published prior to 2000, a review of articles that appear, based on citations, to have shaped the field would involve a small set of articles. A somewhat different but equally small set of articles would be involved in a review of OE articles that have had impact outside the field.

In answer to the questions, we began with: (1) Except for a modest impact in the environmental education field, OE publications as a whole have made no distinct impact in other fields. Citations from outside the field tend to be one-off citations of a particular article, although a very small number of articles have attracted large numbers of citations from outside the field. (2) With one or two exceptions, highly cited articles were published in AJOE, JAEOL, JEE or in larger journals in adjacent fields. Most articles are never cited. The few most-cited articles were dispersed among different publications. (3) If citations are used as a guide to the structure of OE discourse, we found that each of the journals tended to function as a somewhat distinctive discourse, with very modest citations across publications. We were intrigued to find that only some of the most-cited articles were highly cited within the OE field. (4) To the extent that development of the field should be visible in citation patterns, only 19 articles had more than 10 citations from within the OE field itself. The existence of those articles indicates that the field could have developed since 2000, and we think a literature review of those articles could be informative.

There are good reasons to be careful not to over-interpret citation data. It is of limited value without also reviewing the content of the cited articles, but at the same time reviewing content alone without considering citation impact is also limited. Publication impact can occur without a citation impact. Some discourse occurs behind the scenes — reviewers and editors benefit from reviewing manuscripts, and sometimes-interesting discussions occur as part of the reviewing process. Impact occurs on the floor of conferences. Articles that are used as part of undergraduate or other courses could have considerable impact not reflected in citations. Articles can have impact in the profession.

There is a circularity to citations in that the most-cited articles tend to be ranked higher by GS, and therefore appear towards the top of any search result. Nevertheless, we are persuaded that to understand the OE literature, or literatures, attention to if and how any article has been cited is an important consideration, and that citation patterns can at least inform the questions with which the literature can be approached, even if providing only partial answers.

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Notes

1. The name of the Australian Journal of Outdoor Education was changed to the Journal of Outdoor and Environmental Education in 2016.

2. "I propose the index h, defined as the number of papers with citation number ≥ h, as a useful index to characterize the scientific output of a researcher" (Hirsch, 2005, p. 16,569).

3. May 2, 2016

4. The AJOE commenced in a peer-reviewed format in 1998, the JAEOL in 2000, and the JEE in 1978. See Thomas et al. (2009) for an overview of the histories of the respective journals.

References

Adkins, C., & Simmons, B. (2002). Outdoor, experiential, and environmental education: Converging or diverging approaches? ERIC Digest. (EDO-RC-02-1). From ERIC Clearinghouse on Rural Education and Small Schools.

Allison, P., & Pomeroy, E. (2000). How shall we "know?" Epistemological concerns in research in experiential education. *Journal of Experiential Education, 23*(2), 91–98.

Baldwin, C., Persing, J., & Magnuson, D. (2004). The role of theory, research, and evaluation in adventure education. *Journal of Experiential Education, 26*(3), 167–183.

Bengtsson, L., Elg, U., & Lind, J.-I. (1997). Bridging the transatlantic publishing gap: How North American reviewers evaluate European idiographic research. *Scandinavian Journal of Management, 13*(4), 473–492.

Bogner, F. X. (2002). The influence of a residential outdoor education programme to pupil's environmental perception. *European Journal of Psychology of Education, 17*(1), 19–34.

Breunig, M. (2005). Turning experiential education and critical pedagogy theory into praxis. *Journal of Experiential Education, 28*(2), 106–122.

Brookes, A. (2002). Lost in the Australian bush: Outdoor education as curriculum. *Journal of Curriculum Studies, 34*(4), 405–425.

Brookes, A. (2003a). A critique of neo-Hahnian outdoor education theory. Part one: Challenges to the concept of 'character building'. *Journal of Adventure Education and Outdoor Learning, 3*(1), 49–62.

Brookes, A. (2003b). A critique of neo-Hahnian outdoor education theory. Part two: 'The fundamental attribution error' in contemporary outdoor education discourse. *Journal of Adventure Education and Outdoor Learning, 3*(2), 119–132.

Brookes, A. (2004). Astride a long-dead horse. Mainstream outdoor education theory and the central curriculum problem. *Australian Journal of Outdoor Education, 8*(2), 22–33.

Brown, M. (2002). The facilitator as gatekeeper: A critical analysis of social order in facilitation sessions. *Journal of Adventure Education and Outdoor Leadership, 2*(2), 101–112.

Brown, M. (2008). Comfort zone: Model or metaphor. *Australian Journal of Outdoor Education, 12*(1), 3–12.

Brymer, E., & Gray, T. (2006). Effective leadership: Transformational or transactional? *Australian Journal of Outdoor Education, 10*(2), 13–19.

Bunting, C. J., & Donley, J. P. (2002, January). *Ten years of challenge course research: A review of affective outcome studies.* Paper presented at the 6th Coalition for the Education in the Outdoors Research Symposium, Bradford Woods, Indiana.

Davidson, L. (2001). Qualitative research and making meaning from adventure: A case study of boys' experiences of outdoor education at school. *Journal of Adventure Education & Outdoor Learning, 1*(2), 11–20.

Davis, B., Rea, T., & Waite, S. (2006). The special nature of the outdoors: Its contribution to the education of children aged 3–11. *Australian Journal of Outdoor Education, 10*(2), 3–12.

Dillon, J., Rickinson, M., Teamey, K., Morris, M., Choi, M. Y., Sanders, D., & Benefield, P. (2006). The value of outdoor learning: Evidence from research in the UK and elsewhere. *School science review, 87*(320), 107–111.

Dunlap, R. E., & Van Liere, K. D. (2008). The "New Environmental Paradigm." *The Journal of Environmental Education, 40*(1), 19–28. doi: 10.3200/JOEE.40.1.19-28

Estes, C. A. (2004). Promoting student-centered learning in experiential education. *Journal of Experiential Education, 27*(2), 141–160.

Garst, B., Scheider, I., & Baker, D. (2001). Outdoor adventure program participation impacts on adolescent self-perception. *Journal of Experiential Education, 24*(1), 41–49.

Gilbertson, K. (2006). *Outdoor education: Methods and strategies*: Human Kinetics, Champaign Il.

Goldenberg, M., McAvoy, L., & Klenosky, D. B. (2005). Outcomes from the components of an outward bound experience. *Journal of Experiential Education, 28*(2), 123–146.

Gough, N., & Sellers, W. (2004). *Re/de/signing the world: Postructuralism, deconstruction and "reality" in outdoor/environmental education research.* Paper presented at the International Outdoor Education Research Conference: Connections and disconnections: Examining the reality and rhetoric, Bendigo, Victoria, Australia.

Hales, R., & Watkins, M. (2004). *The potential contribution of phenomenography to study individuals' meanings of environmental responsibility*. Paper presented at the International Outdoor Education Research Conference: Connections and disconnections: Examining the reality and rhetoric, Bendigo, Victoria, Australia.

Harrison, S. (2010). "Why are we here?" Taking "place" into account in UK outdoor environmental education. *Journal of Adventure Education & Outdoor Learning, 10*(1), 3–18.

Harzing, A.-W. (2010). *The Publish or Perish book*: Tarma Software Research, Melbourne, Australia.

Harzing, A.-W. (2013). A preliminary test of Google Scholar as a source for citation data: A longitudinal study of Nobel prize winners. *Scientometrics, 94*(3), 1057–1075.

Hirsch, J. E. (2005). An index to quantify an individual's scientific research output. *Proceedings of the National Academy of Sciences, US*, 16569–16572.

Hovelynck, J. (2001). Beyond didactics: A reconnaissance of experiential learning. *Australian Journal of Outdoor Education-Vol, 6*(1), 4–12.

Hubbs, D. L., & Brand, C. F. (2005). The paper mirror: Understanding reflective journaling. *Journal of Experiential Education, 28*(1), 60–71.

Irwin, D. (2008). Weaving the threads: Challenges encountered while educating for sustainability in outdoor education. *New Zealand Journal of Outdoor Education: Ko Tane Mahuta Pupuke, 2*(3), 36–53.

Jones, M. (2004). *Disconnections between outdoor programs and education principles.* Paper presented at the International Outdoor Education Research Conference: Connections and disconnections: Examining the reality and rhetoric, Bendigo, Victoria, Australia.

Loynes, C. (2002). The generative paradigm. *Journal of Adventure Education & Outdoor Learning, 2*(2), 113–125.

LSE Public Policy Group. (2011). *Maximising the impacts of your research: A handbook for social scientists*. London, England: LSE Public Policy Group.

Lugg, A. (2004). Outdoor adventure in Australian outdoor education: Is it a case of roast for Christmas dinner? *Australian Journal of Outdoor Education, 8*(1), 4–11.

Lugg, A. (2007). Developing sustainability-literate citizens through outdoor learning: Possibilities for outdoor education in higher education. *Journal of Adventure Education & Outdoor Learning, 7*(2), 97–112.

Martin, P. (2004a). Outdoor adventure in promoting relationships with nature. *Australian Journal of Outdoor Education, 8*(1), 20–28.

Martin, P. (2004b). *Outdoor education for human/nature relationships.* Paper presented at the International Outdoor Education Research Conference: Connections and disconnections: Examining the reality and rhetoric, Bendigo, Victoria, Australia.

McKenzie, M. (2003). Beyond "the outward bound process": Rethinking student learning. *Journal of Experiential Education, 26*(1), 8–23.

McKenzie, M. D. (2000). How are adventure education program outcomes achieved? A review of the literature. *Australian Journal of Outdoor Education-Vol, 5*(1).

Moseley, C., Reinke, K., & Bookout, V. (2002). The effect of teaching outdoor environmental education on preservice teachers' attitudes toward self-efficacy and outcome expectancy. *The Journal of Environmental Education, 34*(1), 9–15.

Mygind, E. (2007). A comparison between children's physical activity levels at school and learning in an outdoor environment. *Journal of Adventure Education & Outdoor Learning, 7*(2), 161–176.

Mygind, E. (2009). A comparison of children's statements about social relations and teaching in the classroom and in the outdoor environment. *Journal of Adventure Education & Outdoor Learning, 9*(2), 151–169.

Neill, J. T. (2002). *Meta-analytic research on the outcomes of outdoor education.* Paper presented at the 6th Biennial Coalition for Education in the Outdoors Research Symposium, Bradford Woods, IN.

Neill, J. T., & Dias, K. L. (2001). Adventure education and resilience: The double-edged sword. *Journal of Adventure Education & Outdoor Learning, 1*(2), 35–42.

Nicol, R. (2002). Outdoor education: Research topic or universal value? Part one. *Journal of Adventure Education & Outdoor Learning, 2*(1), 29–41.

Nicol, R. (2003). Outdoor education: Research topic or universal value? Part three. *Journal of Adventure Education & Outdoor Learning, 3*(1), 11–27.

Payne, P., & Wattchow, B. (2008). Slow pedagogy and placing education in post-traditional outdoor education. *Australian Journal of Outdoor Education, 12*(1), 25–38.

Payne, P. G. (2002). On the construction, deconstruction and reconstruction of experience in "critical" outdoor education. *Australian Journal of Outdoor Education, 6*(2), 4–21.

Pryor, A., Carpenter, C., & Townsend, M. (2012). Outdoor education and bush adventure therapy: A social-ecological approach to health and wellbeing. *Australian Journal of Outdoor Education, 9*(1), 3–13.

Quay, J. (2003). Experience and participation: Relating theories of learning. *Journal of Experiential Education, 26*(2), 105–112.

Rickinson, M., Dillon, J., Teamey, K., Morris, M., Choi, M. Y., Sanders, D., & Benefied, P. (2004). *A review of research on outdoor learning*. London, England: National Foundation for Educational Research and King's College.

Russell, K. C. (2001). What is wilderness therapy? *Journal of Experiential Education, 24*(2), 70–79.

Russell, K. C. (2006). Brat camp, boot camp, or……..? Exploring wilderness therapy program theory. *Journal of Adventure Education & Outdoor Learning, 6*(1), 51–67.

Sandell, K., & Öhman, J. (2013). An educational tool for outdoor education and environmental concern. *Journal of Adventure Education & Outdoor Learning, 13*(1), 36–55.

Sandseter, E. B. H. (2009). Characteristics of risky play. *Journal of Adventure Education & Outdoor Learning, 9*(1), 3–21.

Sibthorp, J., Paisley, K., Furman, N., & Gookin, J. (2008a). *Long-term impacts attributed to participation in wilderness education: Preliminary findings from NOLS.* Paper presented at the Ninth Biennial Coalition for the Education in the Outdoors Research Symposium, Bradford Woods, Indiana.

Sibthorp, J., Paisley, K., Gookin, J., & Furman, N. (2008b). The pedagogic value of student autonomy in adventure education. *The Journal of Experiential Education, 31*(2), 136–151.

Stewart, A. (2004). Decolonising encounters with the Murray River: Building place responsive outdoor education. *Australian Journal of Outdoor Education, 8*(2), 46–55.

Thomas, G., Potter, T., & Allison, P. (2009). A tale of three journals: A study of papers published in AJOE, JAEOL and JEE between 1998 and 2007. *Australian Journal of Outdoor Education, 13*(1), 16–29.

Wattchow, B. (2004). *Lived-experience in outdoor education: Explorations for the educational practitioner/researcher.* Paper presented at the International Outdoor Education Research Conference: Connections and disconnections: Examining the reality and rhetoric, Bendigo, Victoria, Australia.

Wattchow, B., & Brown, M. (2011). *A pedagogy of place: Outdoor education for a changing world*: Melbourne, Australia: Monash University Publishing.

Woodhouse, J. L., & Knapp, C. E. (2000). Place-based curriculum and instruction: Outdoor and environmental education approaches. ERIC Digest. *Charleston, WV: ERIC Clearinghouse for Rural Education and Small Schools.(ERIC Document Reproduction Services No. ED 448 012).*

Zink, R. (2003). Abseiling at 5, rafting at 10, what do we do with them when they are 15? Why pursuits might seem like an obvious choice for outdoor education. *New Zealand Journal of Outdoor Education, 1*(2), 56–62.

Zink, R., & Boyes, M. (2006). The nature and scope of outdoor education in New Zealand schools. *Australian Journal of Outdoor Education, 10*(1), 11–21.

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