Examining the Scholarly Literature: A Bibliometric Study of Journal Articles Related to Sustainability and the Arts

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Abstract: The Arts shows great promise in working toward a sustainable future as they can have a significant influence on the development of cultural norms. Using bibliometrics, this study uncovers the current body of scholarly literature related to the intersection of sustainability and the Arts. The results show that while there are very few articles (n = 77) published in scholarly journals related to this area, the number of manuscripts and the number of journals publishing manuscripts related to this subject area is increasing. Further, while there is no one individual who stands out to date as a leader in this field, the results show that Australia and Canada have produced the most published articles. Finally, this study demonstrates that scholarly articles related to the Arts and sustainability are mostly being published in well-established interdisciplinary sustainability-related journals and journals associated with the field of education for sustainable development. The results of this study give a more definitive answer to the question: what scholarly literature resources currently exist on the intersection of the Arts and sustainability and offers the scholarly community a better idea of what and how those involved in this area are publishing and mobilizing knowledge regarding their work.

Keywords: The Arts; sustainable development; sustainability; bibliometrics

1. Introduction

The planet is in crisis, and the survival of humanity is contingent on making significant changes to the way that humans live on earth so that we can live more sustainably and in harmony with the planet [1,2]. The Anthropocene is a new (albeit somewhat contested) era in which humans have drastically changed the functioning of the planet [3]. It is also an era in which many sustainability scholars hope to solve and fix the problems that humans themselves have created. Yet despite wide public recognition that sustainability and environmental issues are putting the future health of humanity in peril [4], and the balance of scientific evidence that demonstrates the scale and gravity of our environmental problems [5], society has been slow to respond. Scientists have been extremely effective in diagnosing our global sustainability problems, yet science has largely failed to develop effective and implementable solutions. While scientific research has demonstrated the obvious solutions to environmental issues (i.e., in the case of climate change, humanity simply needs to reduce greenhouse gas emissions), the realization of solutions is impeded by social and political realities, a lack of ecological literacy amongst decision-makers, and often an absence of will on the part of society. Frequently technical fixes to global sustainability problems are suggested and/or implemented rather than instigating more radical solutions that are essential for a transformative, fundamental, and ultimately sustainable change in the way humanity lives on the planet [6].

One of the barriers to developing effective and transformative societal solutions is that people have been enculturated to think and live in a relationship with the world in a way that is truly unsustainable [7].
Any solution to the sustainability crisis must, therefore, involve changing that culture. It is only when culture changes that the solutions identified by science can be realized. As Ehrlich and Ehrlich [8] suggest, it is essential that humanity rethink its relationship with the planet and its place in the ecosphere. Further, Packalen argues that a sustainable future is only attainable if we culturally transform our entire society [9].

Tabara et al. argue that one of the key challenges for working toward a sustainable future is to “move from the traditional focus on the research question about ‘what is the problem’, to exploring the question of ‘who is the solution’ and to better understand of the role of agency.” [10] (p. 809). In that light, there is a growing recognition that the Arts can play a critical role in creating this cultural change needed to transition to a sustainable future [9,11]. The Arts (i.e., visual and performing arts) shows great promise in working toward sustainability as they can have a significant influence on the development of cultural norms through informal and non-formal forms of education. In the past, the Arts have been used as tools in social change and social innovation agendas like poverty alleviation, health promotion, and social justice [11]. Packalen suggests that the Arts are effective as they have the ability to communicate ideas, visions and existential experiences in a way that other ways of learning cannot [9]. The Arts often target emotions and challenge beliefs, which makes it a potential powerhouse medium for the sustainability movement [12].

Given the promise of the Arts in the sustainability movement, it is surprising that very few published scholarly works are associated with the topic [13]. While Wright and Kent found over two million articles related to environment and/or various derivations of the term sustainability, and just under two million articles associated with the Arts (using a multitude of keyword searches including fine art, poetry, music, theatre, drama, dramatic arts, dance, performing art, visual art, craft, ceramics, sculpture, etc.), only 21 of the articles they retrieved referred to both. In other words, only a small number of articles that were available in the scholarly databases were relevant to the intersection of the environment, sustainability, and the Arts [13]. Wright and Kent, consequently, suggested that if scholarly works related to the intersection of the Arts and sustainability do exist in the scholarly databases, then there is no common vocabulary used by artists and/or scholars to make it possible for traditional bibliographic indexing to identify these works in academic databases. They further hypothesize that while more works related to the intersection of the Arts and sustainability may exist, they may be located outside of conventional scholarly mediums (e.g., websites, playbills, exhibition catalogues, and other grey literature), and, therefore, not accessible through traditional databases.

Inspired by the work of Wright and Kent, this study attempts to uncover the current body of literature related to the intersection of sustainability and the Arts in the scholarly databases using an updated and better-informed set of keywords with which to search for articles. It should be noted that this paper is part of a larger research program that also involves an examination of the grey literature in the Arts and sustainability [14]. The results of this particular study give a more definitive answer to the question: what scholarly literature resources currently exist on the intersection of the Arts and sustainability. The results offer the scholarly community a better idea of what and how those involved in this field are publishing and mobilizing knowledge regarding their work.

2. Methods

Bibliometry is the quantitative study of document-related processes and the exploration of publication statistics. Bibliometric studies can be used to examine issues such as dispersion of references, concentration of papers within a given field, hierarchical dependency between fields, and links between fields [15,16]. This bibliometric study tracks and documents published scholarly journal articles related to the intersection of sustainability and the Arts, and then analyzes them according to type of publication, journal title, author(s), country and institutional affiliation of the author(s), and keywords used. It should be noted that this paper focuses on searching for scholarship related to the arts and sustainability, and does not address arts practice or documents related to arts practice located outside of conventional scholarly mediums (e.g., websites, playbills, exhibition
catalogues, and other grey literature), and, therefore, not accessible through traditional databases. The following section outlines the methodological procedures that we undertook for this study.

First, to locate journal articles related to the Arts and sustainable development in the databases, we began with a search of multidisciplinary databases. Building on the work of Wright and Kent [13], we developed a new set of keywords, based on in-depth interviews with individuals currently involved with work at the intersection of sustainability and the Arts [17]. Using the new keywords, we searched over 15 databases for articles. For each of the articles retrieved we manually inspected them to determine their relevance to our topic. Keywords that did not bring in relevant articles were discarded, and databases that did not produce relevant articles were also discarded. After significant trial and error with using a number of keywords (including climate, climate change, ecology, environment, environmental humanities), and a manual evaluation of the articles that were retrieved, we settled on a final set of search terms and the final databases that would be used (see Table 1 for search and keyword strategy for journal article searching). The databases that were chosen to remain were chosen because of their extensive coverage of tens of thousands of journals that include broad treatment of the environment, sustainability, the Arts, and interdisciplinary scholarship, and because of their initial return of relevant articles in trial searches. The databases selected include Agricultural & Environmental Science, Web of Science, Scopus, and JSTOR.

Table 1. Journal search strategies.

| Searching Source                        | Search Terms                                                                 |
|-----------------------------------------|-----------------------------------------------------------------------------|
| Multidisciplinary Databases:            | (sustainability OR “sustainable development” OR environment*) AND “the Arts” |
| • Agricultural & Environmental Science |                                                                             |
| • Environment Complete                  |                                                                             |
| • JSTOR                                 |                                                                             |
| • Scopus                                |                                                                             |
| • Web of Science                        |                                                                             |
| Specialized Journals:                   | (sustainability OR “sustainable development” OR environment*) AND “the Arts” |
| • Environment, Development and Sustainability |                                                  |
| • Journal of Cleaner Production         |                                                                             |
| • Sustainability                        |                                                                             |
| • International Journal of Sustainability in Higher Education |                                              |
| • International Social Science Journal  |                                                                             |
| • The International Journal of Social, Political and Community Agendas in the Arts |                                               |
| • The International Journal of the Arts in Society |                                           |
| • The Goose: A Journal of Arts, Environment, and Culture in Canada |                                               |

Agricultural & Environmental Science, Environment Complete, Web of Science, and Scopus are key databases for environmental studies. Agricultural & Environmental Science collects journals around the world. Environment Complete collects journal articles and it covers various aspects of environmental studies, including ecology, environmental technology, public policy, social impacts, and urban planning. Also, Web of Science and Scopus can be used for searching journal articles related to arts. Web of Science Citation Index covers more than 5600 journals and its Arts & Humanities Citation Index covers more than 1140 journals. Scopus is one of the largest databases of peer-reviewed literature, covering sciences, social sciences, and the arts and humanities. JSTOR is a multidisciplinary database that collects 10 million journal articles, and it covers humanities, social science, and sciences. Journal articles about art and art history, performing arts, architecture, and music can be found in JSTOR. For the database search, a total of 444 were retrieved, but only 65 were considered relevant.
to our subject area (many articles looked at the sustainability of the arts from a financial perspective instead of from an environmental/ecological perspective).

In addition to the database search, we conducted searches of specialized journals (see Table 1). These journals were purposively selected based on their prior publication of articles related to sustainability and/or the Arts, as identified in our trial searches. The Journal of Cleaner Production is an international, transdisciplinary journal that focuses on sustainability research and practice. The journal Sustainability is an international journal that focuses on environmental, cultural, economic, and social sustainability. Environment, Development and Sustainability is an international, multidisciplinary journal covering environment and societal development. The International Journal of Sustainability in Higher Education focuses on sustainable development in higher education context, covering sustainable development, planning, and policies. The International Social Science Journal spans social sciences and other disciplines. The Goose is a Canadian journal that covers multiple fields including environmental literature and art, ecocriticism, Eco theory, and green cultural studies.

Using the keywords established for the search of the multidisciplinary databases (above), we also searched the specialized journals. For each of the articles retrieved, we manually inspected them to determine the relevance of the article to our topic. If the article was not relevant to our query, then it was discarded. It should be noted that if the article was already present in our collection from the database search, it was still included in the count of articles retrieved in the specialized journals (Table 2). For the specialized journal search, a total of 377 were retrieved, but only 30 were considered relevant to our study. Table 2 illustrates the distribution of results for each database or journal.

| Database/Journal                                      | No of Records Returned | No of Relevant Documents (Including Duplicates) |
|------------------------------------------------------|------------------------|-------------------------------------------------|
| Agricultural & Environmental Science                 | 76                     | 21                                              |
| Environment Complete                                  | 16                     | 9                                               |
| JSTOR                                                 | 33                     | 6                                               |
| Scopus                                                | 21                     | 3                                               |
| Web of Science                                        | 298                    | 26                                              |
| Journal of Cleaner Production                         | 232                    | 11                                              |
| Sustainability                                        | 70                     | 7                                               |
| Environment, Development and Sustainability           | 5                      | 0                                               |
| International Journal of Sustainability in Higher     | 34                     | 5                                               |
| Education                                             |                        |                                                 |
| International Social Science Journal                  | 22                     | 1                                               |
| The International Journal of Social, Political and    | 10                     | 2                                               |
| Community Agendas in the Arts                        |                        |                                                 |
| The Goose: A Journal of Arts, Environment, and        | 4                      | 4                                               |
| Culture in Canada                                     |                        |                                                 |
| Total                                                 | 821                    | 95                                              |

Finally, the 95 relevant articles were reviewed and duplicates (n = 18) were discarded. The abstracts for each article were recorded, and the articles were analyzed using bibliometric techniques. Articles were analyzed in Excel, extracting information for each article with regards to journal title, article title, author(s), country and institutional affiliation of the author(s), and keywords used. In addition, the abstracts were read and coded using a posteriori coding techniques to determine if there were any major emerging trends and/or keywords used in the articles.

Some limitations to the study must be offered at this point. First, our search was limited to English-language articles. The study does not capture contributions made in non-English journals or through other legitimate academic dissemination tools, such as conference proceedings and grey literature. Second, it is possible that there are some English-language journal articles that pertain to the Arts and sustainability that do not use these terms in their title, keywords, or abstract, and were, therefore, left out of this dataset. The purpose of this study was to investigate articles that specifically (rather than peripherally) addressed the Arts and sustainability, so it is anticipated that this is not a significant limitation. Finally, while we coded the abstracts to get an idea of any major themes associated with the articles, the articles were not read in full. It is therefore possible that more themes than those revealed in our results below could be present.
3. Results

After removing duplicate articles, our dataset consisted of 77 individual articles from a total of 43 journals between the years 2000 and 2018. The results of the bibliometric analysis are presented below, interspersed with discussions regarding the evolution of the literature where the Arts and sustainability intersect.

3.1. Total Publications and Journals

The number of articles published between 2000 and 2018 related to the intersection of the Arts and sustainability was 77. The start date of 2000 was not an arbitrary date delineated by the research team, but rather the earliest publication date that we found in all of the articles that we retrieved. As is demonstrated in Figure 1, the number of articles related to the Arts and sustainability increased from 2000 to 2017 with a slight decrease in 2018. It is significant to note the trend toward more articles being published. It is anticipated that the upward trend will continue into 2018 in future investigations, but that some articles published in 2018 have not yet been picked up by the scholarly databases, thus explaining the small dip in the number of articles published.

![Figure 1. Number of articles related to sustainability and the Arts.](image)

The 77 individual articles were found in 43 different journals. Table 3 displays the journals with the most publications related to our subject of interest. The Journal of Cleaner Production contains 12 articles related to sustainability and Arts. Other journals that were considered in our analysis as having the most relevant articles were the International Journal of Sustainability in Higher Education \((n = 8)\), Sustainability \((n = 7)\), and The Goose \((n = 6)\). It is interesting to note that the top two publishing journals are very much associated with the domain of education for sustainable development (ESD), and not journals that are more generally associated with sustainability and/or sustainability and the Arts (in the case of The Goose). This trend is not surprising in that Wright and Kent found that many of the articles related to sustainability and the Arts were also correlated with keywords related to education, environmental education, and ESD [13]. Further, while The Goose is a small journal dedicated to environmental literature and art, ecocriticism, eco theory, and green cultural studies, there is no international journal currently dedicated to sustainability and the Arts, so it is anticipated that scholars wishing to publish manuscripts related to the subject would have to find other related journals to publish their work in, and might have opted for journals that are well known and established in the international sustainability education community.
Table 3. Journals with Most Articles Published.

| Journal                                           | Number of Articles |
|---------------------------------------------------|--------------------|
| Journal of Cleaner Production                     | 12                 |
| International Journal of Sustainability in Higher Education | 8                  |
| Sustainability                                    | 7                  |
| The Goose                                         | 6                  |

Table 4 shows the journals with the most publications in each given year of our study. As is demonstrated, the first 13 years of publications related to the Arts and sustainability shows top journals for the year publishing no more than a single article. However, Table 3 also shows a variety of journals in which arts and sustainability articles were published that did not end up being Top Journals overall. For example, the Journal of Cultural Studies published related articles in 2001 and 2002 but did not appear again as a top journal in subsequent years. Also, it is not until 2016 (with the slightly anomalous exception of 2013 and 2014) that a trend is seen toward any journal publishing more than one article on the subject matter. The overall increase in the number of journals publishing related articles may be explained by the growing recognition that the Arts has a pivotal role to play in creating a sustainable future, and as this becomes a relevant area of inquiry within sustainability scholarship, the number of journals publishing related articles has increased.

Table 4. Journal with the highest numbers of publication per year.

| Year   | Top Journals                                                                 | Article Per Journal |
|--------|------------------------------------------------------------------------------|--------------------|
| 2000   | Science and Engineering Ethics                                               | 1                  |
| 2001   | International Journal of Sustainability in Higher Education                  | 1                  |
|        | International Journal of Cultural Studies                                    | 1                  |
| 2004   | International Journal of Cultural Studies                                    | 1                  |
| 2008   | Australian Journal of Early Childhood                                        | 1                  |
| 2010   | Cultural Geographies                                                         | 1                  |
|        | Journal of Cleaner Production                                                | 1                  |
| 2011   | International Journal of Sustainability in Higher Education                  | 1                  |
|        | Journal of Agricultural Education and Extension                              | 1                  |
|        | Journal of Environmental Assessment Policy & Management                       | 1                  |
|        | Wiley Interdisciplinary Reviews                                              | 1                  |
| 2012   | Ride-the Journal of Applied Theatre and Performance                          | 1                  |
|        | Ecology and Society                                                          | 1                  |
|        | Science as Culture                                                           | 1                  |
|        | International Electronic Journal of Environmental Education                  | 1                  |
|        | International Journal of Sustainability in Higher Education                  | 1                  |
|        | International Journal of Technology Management                               | 1                  |
| 2013   | International Journal of Sustainability in Higher Education                  | 3                  |
| 2014   | Sustainability                                                               | 2                  |
| 2015   | Journal of Adventure Education and Outdoor Learning                          | 1                  |
|        | Arts and Humanities in Higher Education                                     | 1                  |
|        | Sustainability                                                               | 1                  |
|        | Journal for Nature Conservation                                              | 1                  |
|        | Cultural Studies of Science Education                                       | 1                  |
|        | Contemporary Music Review                                                    | 1                  |
|        | Ecosphere                                                                    | 1                  |
| 2016   | SpringerPlus                                                                 | 2                  |
|        | The Goose                                                                   | 3                  |
|        | Journal of Cleaner Production                                                | 3                  |
| 2017   | Journal of Cleaner Production                                                | 6                  |
|        | The Goose                                                                   | 3                  |
|        | Sustainability                                                               | 2                  |
| 2018   | Journal of Cleaner Production                                                | 2                  |
|        | International Journal of Cultural Policy                                     | 1                  |
3.2. Primary Publishing Authors

For each article retrieved, primary, and where applicable secondary, authors were recorded. In our analysis, each author was considered to have contributed equally to the manuscript and was given equal weight in terms of authorship. In total, 135 authors were associated with at least one article in our collection. Thirty-two of the articles were published by a single author, and 45 of the articles had two or more authors associated with the manuscript. Table 5 reveals the authors with the most articles related to sustainability and the Arts from 2000 to 2018. As is demonstrated, Curtis is the top published author in the area (n = 4), but no one person has dominated the field (with most authors associated with our 77 collected articles having only one publication regarding sustainability and the Arts associated with their publishing activities). This result can potentially be explained in two ways. First, we suggest that the field is only burgeoning in terms of scholarly literature, and that no one person has yet dedicated their scholarly practice to this field, but has rather published articles related to the Arts and sustainability on the periphery of their main area of research. Second, it is possible that those publishing scholarly literature in this area are doing so in other settings (i.e., the grey literature), or are not using the keywords that were used in this study to describe their research.

| Author         | Number of Articles |
|----------------|--------------------|
| Curtis, D. J.  | 4                  |
| Angeler, D. G. | 2                  |
| Shrivastava, P.| 2                  |
| Banting, P.    | 2                  |
| Reid, N.       | 2                  |
| Gabrys, J.     | 2                  |
| Yussuf, K.     | 2                  |
| Ivanaj, S.     | 2                  |
| Gray, T.       | 2                  |
| Kerber, J.     | 2                  |

When examining the current country of residence of the publishing authors, it was found that 20 different countries were represented by the 135 authors in the 77 articles retrieved. In terms of country of origin, the greatest number of articles were from authors in Australia, followed by Canada and the United States (Table 6). While we analyzed the institutional affiliation of each of the authors, no single leading institution was found in terms of publishing in the area of sustainability and the Arts.

| Country    | Number of Articles |
|------------|--------------------|
| Australia  | 14                 |
| Canada     | 11                 |
| US         | 8                  |
| UK         | 6                  |
| France     | 5                  |
| Sweden     | 4                  |
| Taiwan     | 4                  |
| Netherlands| 3                  |
| Belgium    | 2                  |
| China      | 2                  |
| Germany    | 2                  |
| Italy      | 2                  |

3.3. Additional Keywords

As previously mentioned, the keywords used for this study were based on input from three different things: (a) the keywords used by Ken and Wright [13], (b) the keywords discovered by
Yackamovich and Wright [17] and, (c) trial searches at the beginning of this study. While the keywords were deemed trustworthy based on these three sources, we decided to investigate other keywords that were used in the 77 articles collected to determine if there were other relevant search terms that could be used in the future. Table 7 shows that the top keywords (in addition to those used in our original search). The results suggest that many people who discuss sustainability and the Arts do so within the context of education ($n = 14$), learning ($n = 10$), and behaviour change ($n = 13$). This is consistent with the results of Wright and Kent [13], who found that the majority of articles published in the field were related to formal, non-formal, and/or informal education and ESD. While it is beyond the scope of this bibliometric paper to do an in-depth analysis of the text of each of the articles, it may be that even more of the 77 articles discuss some aspects of the arts and sustainability, behaviour change, and/or education, but do not use these as keywords.

Table 7. Additional keywords and frequency.

| Keywords               | Frequency |
|------------------------|-----------|
| Education              | 14        |
| Behaviour change       | 13        |
| Ecology/ecological     | 12        |
| Nature/natural         | 11        |
| Learning               | 10        |
| Science(s)             | 10        |

4. Conclusions

This study has shown that, while there are still very few articles published in English-language scholarly journals related to the intersection of the Arts and sustainability, the number of manuscripts related to this subject area is increasing. Further, the number of journals that are publishing articles in this area is also growing. While there is no one individual author associated with the articles who stands out to date as a leader in this scholarly field, the results do show that Australia and Canada have produced the most published articles related to the intersection of sustainability and the Arts. Finally, this study demonstrates that scholarly articles related to the intersection of the Arts and sustainability are mostly being published in well-established interdisciplinary sustainability-related journals, as well as some specialized journals (e.g., The Goose), with a large number being published in journals associated with education for sustainable development.

This study contributes to the evolving body of literature in the area where the Arts and sustainability intersect by establishing a better understanding of the keywords authors use when describing their manuscripts. Using keywords established by Wright and Kent [13], and modified as a result of interviews with Canadian artists engaged in eco-art [17], we searched over 15 databases for articles and found over 77 articles (as compared to their original search which only produced 21 articles in total—even though it should be noted that a large number of the articles we found were written after the publication of the Wright and Kent article). In addition to the keywords used in retrieving the articles for this study (various derivations of the term “sustainability” and “the Arts”), an analysis of additional keywords used in these 77 articles reveal potential new keywords (Table 5) that could be used in future searches of the literature to potentially identify even more articles. We note that the keywords that we have established are not yet a definitive list of those needed to retrieve all relevant articles. This is exemplified by the relatively few articles we retrieved from The Goose in comparison with the other top publishing journals (Table 1). Given the focus of The Goose on the Arts and the environment, when we began our search, we anticipated that a plethora of articles would be retrieved. This was not the case. We, therefore, recommend that future studies should examine specifically the keywords used in this particular journal and compare them with the keywords established in this study.

While the tool of bibliometry allowed for this cursory understanding of publishing activities related to the intersection of the Arts and sustainability, it did not allow for an in-depth analysis
of the substance of each article. A content analysis of the 77 journal articles retrieved in this study would be an excellent contribution to our understanding of this field. Further, because this study was delimited to English-language journals, complementary research would involve the examination of non-English language journals. Further, an investigation that accounted for articles at the intersection of the Arts and sustainability in the grey literature could offer a more comprehensive understanding of all dissemination activities in the nascent field.

A large frustration for the authors of this study, was the way in which various databases archive manuscripts. We found that indexing was not consistent amongst the databases. For example, ProQuest uses subject headings but not keywords. Further individual journals are not consistent with the descriptors used for an individual article (for example, some journals did not use keywords at all when describing an article). It would be helpful for the field of information management to consider using consistent terms from database to database for better searchability and comparability.

Finally, we suggest that scholarly research related to the intersection of the Arts and sustainability is a promising field. As such, we recommend that journals dedicated to sustainability scholarship consider developing special issues related to this area as to allow for scholars working in this realm to discuss their work in a collaborative and focused forum. We further suggest that publishers consider establishing an international journal dedicated to the intersection of sustainability and the Arts, so that scholars wishing to publish manuscripts related to the subject area would have a dedicated journal to publish their work in. Such a journal would aid in creating an academic community of practice in this important sub-field of sustainability scholarship.

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