Production patterns and dissemination avenues in knowledge management research in Eastern and Southern Africa Region, 1991-2016

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Abstract

Using a bibliometrics analysis, this paper examines the production patterns and dissemination avenues in knowledge management research in Eastern and Southern Africa (E&SA) region as indexed in Scopus database for the period 1991-2016. The study leading to this paper used a quantitative approach as the study required numerical data to achieve its objectives. Data was collected from the SCOPUS database using a variety of keywords. The VosViewer software and Microsoft Excel were used to analyse, visualise and present the data. There were a total of 3,681 papers published on KM in Eastern and Southern Africa between 1991 and 2016. The number of publications is not consistent and varies from year to year. The minimum number of publications per year was seven (7) while 518 was the highest. The number of publications stagnated between 1991 and 1992, with a slow growth rate being observed from 1993 to 2000. There was a significant steady increase in the number of publications from 2001 to 2016. Engelbrecht, A.P., Marwala T. and Meyer T. were the most prolific authors, with an output that surpasses 30 publications, comprising roughly 5.15% of the total publications. Most of the productive authors originated from or were affiliated with South African institutions. Consequently, South Africa was the greatest contributor of the bulk of KM research output (2,753; 74.9%) of the total publications. 40.32% of the analysed publications correspond to international contribution, representing 14 foreign countries of the top 25 countries

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producing KM research. The study has revealed increased KM research outputs through collaborative efforts among authors, institutions and countries, at the local and international level. The largest share of these publications goes to South Africa. The study has also revealed a steady increase in the growth rate of KM research sources, with an average number of nearly 27 publications per source. Most KM publications were published across disciplines, with most productive source titles categorised as both conference papers (1,689; 46%) and journal articles (1,653; 45%). The authors recommend that each Individual country should have clearly defined strategies on the use and publication of research findings conducted within its territory. Researchers should increase both internal and external collaboration, undertake research in the field of KM and publish their findings in high-quality open access journals in a bid to advance KM research productivity and impact in the Eastern and Southern Africa region.

Keywords: bibliometric analysis, content analysis, knowledge management, Eastern and Southern Africa, Scopus.

1 Introduction

The concept of Knowledge management (KM) has been part of the economy for decades. The growth of KM as a discipline spans many years and can be traced as far back as the 1990s during the scientific and strategic management demarcations (Park & Kim, 2005), when harnessing an organisation's knowledge, sharing expertise and disseminating knowledge at the right time to the right people was recognised as a means to achieving competitive advantage (Rono, 2011; Hlupic, Pouloudi, & Rzevski, 2002). It can therefore be said that KM is not a radically new concept, since many of its principles originate from a variety of disciplines with different names (Davidova, Kokina and Zarina, 2014). Similar ideologies have emerged that have contributed to KM's growth, at first steadily but then rapidly gaining the widespread attention of researchers, practitioners and policy makers (Harman & Koohang, 2005; Nonaka & Peltokorpi, 2006; Serenko, 2013). Many institutions and organisations all over the world have likewise embraced knowledge management as a subject (Vu-Thi & Stenberg, 2017; Park & Kim, 2005).

Serenko and Bontis (2004) emphasise that the popularity of KM has increased dramatically over the last decade amongst the academics and practitioners. Though KM is perceived as a young interdisciplinary area, the field has notably received tremendous attention and is being used to support a wide-range of applications (Qiu & Lv, 2014). It has become a predominant field within the business processes and management landscape (Moustaghfir & Schiuma, 2013) hence it is considered a vital source for sustainable competitive advantage in organisations (Ramy, Floody, Ragab & Arisha, 2017).

It is not surprising, therefore, that KM practices are deeply entrenched in the economic spheres. This can be attributed to the fact that corporate knowledge and its management has intensified over the years (Kokol, Zlahtic, Zlahtic, Zorman & Podgorelec, 2015), attracting the interest of academics, economists and practitioners (Kokol, Zlahtic, Zlahtic, Zorman & Podgorelec, 2015). As a result, there has been an increasing trend of embracing knowledge management. Many organisations have since considered KM as a tool for saving organisations costs and propelling growth (Chaudhary, 2005). As such, knowledge management has been recognised as a critical organisational management tool (Rono, 2011). The adoption of knowledge management as a management strategy has promoted a knowledge-driven organisational culture, enabling organisations to gain competitive advantage.

Notwithstanding the above-mentioned developments in the KM discipline, as a subject KM has grown massively and has thus attracted significant attention from a number of disciplines over the years (Ndwandwe & Onyancha, 2011). However, KM as a research theme and an organisational strategy, has received varying concepts such as the meaning of KM (Chua, 2009). Nonetheless, being a new research discipline, KM has boasted a great deal of scientometrics research in a bid to define its identity better (Kokol, Zlahtic, Zlahtic, Zorman & Podgorelec, 2015).

2 Contextual setting

This study focused on the Eastern and Southern African (E&SA) region on the African continent. This is a vast, geographically diverse region that stretches from the Red

Sea in the north to the Cape of Good Hope in the south (UNICEF, 2017). This region comprises 22 countries. According to the International Food Policy Research Institute (2017), the last 15 years have witnessed massive economic growth, particularly in the land and agricultural sector in the E&SA region. In spite of this rapid economic growth over that period, the economic outlook for the E&SA region, just like for Africa as a whole, remains optimistic, even in the face of challenging global macro-economic conditions.

In terms of research and development, the World Bank (2016) approved E&SA region Higher Education Centres of Excellence Project for the purposes of supporting the region to promote specialisation among participating universities in areas that address regional challenges by strengthening their capacities to offer quality training as well as applied research. As such, there is likely to be a steady growth of research in most of the E&SA region countries.

3 Review of literature

This section reviews relevant literature covering KM publications and journal articles according to the salient themes of the topic of this study.

3.1 Publication patterns and trends of knowledge management research output

Reviewed literature indicates that KM is growing steadily and is rapidly gaining widespread attention of researchers, practitioners and policy makers (Harman & Koohang, 2005; Nonaka & Peltokorpi, 2006; Serenko, 2013), and as a result, its popularity has increased dramatically over the last decade (Serenko and Bontis, 2004). Qiu and Lv (2014) found that research on knowledge management has been published in a large number of journals with authors affiliated to institutions world-wide. These research studies have established a number of bibliometric projects which have been widely applied in different disciplines. In their study on an overview of knowledge management research viewed through the web of science, in 1993-2012 there were 12,925 publications relating to KM research in 21 languages, English being a dominant language in KM research, with 12,556 publications, representing

97.15%. They also found that there is an annual increase in the number of authors (i.e. 3,489), number of publications (i.e. 1,576) and the number of KM publication topics (i.e. 721) during the period 1993-2009.

Kumar and Mohindra (2015) in their study of KM research from 2000 to 2014 exploring the research trends, used the necessary bibliometric measures to analyse KM research trends. They found that there were an average of approximately 342 articles published every year. The highest number (583) were published in 2012, while the lowest number (128) appeared in 2000. They also found that authorship patterns and average author per article recorded a total of 10,421 authors with a total of 5,127 articles published, with most of the publications being single authored publications.

Similarly, Barik and Jena (2013), in their study on bibliometric analysis of the *Journal of knowledge management practice* 2008-2012, found that single-authored articles dominated (about 50% of the total articles published in the Journal), followed by two-authored articles and three-authored articles respectively.

The study by Akhavan, Ebrahim, Fetrati and Pezeshkan (2016) on major trends in knowledge management research, employed bibliometric and text mining analyses to investigate major trends in KM research from 1980 to 2014. They found that KM publications had increased at a slow rate from 1987 to 2006, with a steady but sudden increase in 2007.

Sedighi and Jalalimanesh (2017), in their study on mapping research trends in the field of knowledge management 2001-2010, found that the annual growth rate of KM research outputs in WoS was 10.9%. Similarly, Serenko and Bontis (2004) revealed in their study, a meta-review of knowledge management and intellectual capital literature by citation impact and research productivity rankings, that over the past decade, the number of articles on KM and IC has been increasing at the rate of 50% per annum.

3.2 Producers of knowledge management research output

The publication of knowledge management research outputs follows a consistent pattern associated with the number of researchers or scholars in a particular country. According to Research Trends (2008), the share of the world's articles is dominated by countries with the most researchers and other institutions.

Kumar and Mohindra (2015) analysed KM research in their analysis on KM research for the period 2000-2014 by using a bibliometric approach. The study found that 107 countries contributed a total of 5,127 KM articles; the top ten countries with the highest research output (i.e. USA, England, Taiwan, Spain, China, Canada, Germany, Australia, France and Italy) contributed 4,159 articles, accounting for roughly 81.12% of the total research output. The study also revealed that the largest number of publications were produced in English, accounting for 94.77%, followed by Spanish, German, Portuguese, French and others.

Jena, Swain and Sahoo (2012) analysed the journal *Annals of Library and Information Studies* (ALIS), 2002-2010. The study found that there were a total of 476 authors representing 12 different countries. Similarly, Wadhwana and Chikate (2016) in their study on the bibliometric analysis of contributions in the journal *Library Progress International* given its international level of distribution, the results revealed that only 24% of the authors were "foreigners": 76% were local or Indian authors. Thanuskodi (2011), in his bibliometric analysis of the journal *Library Herald* 2006-2010, revealed that most of the articles contributed (124; 89.85%) were from India, while a small number of articles contributed (14; 10.15%) were from "foreign sources".

Barik and Jena (2013) conducted a bibliometric analysis of the *Journal of knowledge management practice* from 2008-2012. The study found out that during the period under study, authors from 38 countries published their articles in the journal. On the other hand, Kokol, Zlahtic, Zlahtic, Zorman and Podgorelec (2015) in their study on the bibliometric analysis of research trends on knowledge management in organisations during the period, 1977-2014, found that the top ten countries accounted for 65.1% of all the published research outputs. The study also revealed

that the most productive institutions were in the developed and most productive countries.

Qiu and Lv (2014) revealed in their bibliometric study on an overview of knowledge management research viewed through the web of science, 1993-2012, that there was an annual increase in the number of countries or regions participating in KM research during the period 1993-2006. The period 2007-2012 reported a fluctuation of the annual number of countries or regions. During the 20-year period, three publication types were found in the 12,925 selected publications, namely journals, books and series. In this case, journal articles were mostly used, with the journal of KM at the top by the number of the publications.

3.3 Avenues of sources disseminating knowledge management research output

Popular journals are frequently referred to and scholars prefer to publish in those journals simply because of the cordial relationships enjoyed within the field of research and the journal (Ram & Paliwal, 2014). Kumar and Mohindra (2015) in their bibliometric analysis on knowledge management research, analysed publications in terms of their growth, geographical distribution, most productive journals, top authors, highly cited papers, etc. The study found that a total of 5,127 articles were published in 1,070 journals in the field of KM. The study also revealed that the top 20 most productive journals contained (1,564; 30.5%) of the total articles. The maximum number of articles (269; 5.25%) were published in KM journal.

4 Methodology

The present study employed bibliometrics and content analysis as the research design to collect data. The study targeted all articles on knowledge management published between 1991 and 2016 and indexed in the Scopus database. because it is the largest abstract and citation database of peer-reviewed literature which includes scientific journals, books and conference proceedings. The period 1991 to 2016 was considered because this is the period scientific research output in the Eastern and Southern Africa region recorded rapid growth (Park & Kim, 2005; World Bank, 2016; Rono, 2011; Hlupic, Pouloudi & Rzevski, 2002).

A search was conducted within titles, abstracts and keywords fields. Search #1 involved a search for terms, in Table 1, using the OR Boolean operator. Similarly Search #2 followed the strategy used in Search #1 but involved keywords, in Table 2. The two searches were then combined using the AND Boolean operator, i.e. Search #3 = Search #1 AND Search #2.

Table 1: List of names of countries in E&SA regions used to search and retrieve data from Scopus database

Angola	Botswana	Djibouti	Eritrea	Ethiopia
Kenya	Lesotho	Madagascar	Malawi	Mauritius
Mozambique	Namibia	Seychelles	Somalia	South Africa
South Sudan	Sudan	Swaziland	Zimbabwe	Tanzania
Uganda	Zambia			

Table 2: List of keywords used to search and retrieve data from the Scopus database

Knowledge Management	Information Management	Knowledge Sharing
Artificial Intelligence	Knowledge Economy	Knowledge Transfer
Organisational Learning	Intellectual Capital	Knowledge
Knowledge based Organisation	Knowledge Culture	Knowledge Audit
Knowledge Strategy	Knowledge Worker	Knowledge Retrieval
Knowledge Capture	Knowledge Creation	Knowledge Elicitation
Knowledge Acquisition	Knowledge Engineering	Tacit Knowledge
Explicit Knowledge	Knowledge Management Model	Intellectual Capital/asset
Organization culture	Computer science	Management science
Library science	Information science	Information retrieval
ICT/Internet	Learning organization	Project management
Information need	Business process	Software development
Knowledge structure	Knowledge flow	Contextual knowledge
Knowledge organization	Human Capital	Social knowledge
Organizational memory (OM)	Knowledge Infrastructure	Knowledge work
Knowledge conversion	Organizational performance	Software engineering
Knowledge Integration	Document management	Social network
Customer knowledge	Knowledge visualisation	Knowledge search
Knowledge modeling	Knowledge engineering	Knowledge discovery
Socialization	Knowledge mapping	Competitive Intelligence
Knowledge Management Process	Intangible asset	knowledge base
Knowledge dissemination	Community of Practice (CoP)	Content management
Knowledge life cycle	Knowledge asset	Data mining
Knowledge representation	Knowledge network	Knowledge managers
Knowledge codification	Expert system	Implicit knowledge
Risk management	Innovation	Knowledge flow
Knowledge Management Systems	Knowledge methods	Knowledge repository
Management	Knowledge society	Knowledge exchange
Knowledge market	Knowledge broker	Knowledge education
Knowledge based system	Learning organisation	Story telling
After action review	Lessons learnt	Intellectual property

Information systems /management systems	Knowledge sharing platform	Knowledge soliciting
Knowledge retention	Knowledge codification	

The search results were saved in csv format, which is compatible with VosViewer software that was used to analyse the data. The VosViewer is a software tool for constructing and visualising bibliometric networks for such items as journals, researchers, or individual publications. The networks may be based on citations, bibliographic coupling, co-citation, or co-authorship relations. This study applied the co-authorship option to analyse the data in order to generate production networks for authors, institutions and countries. The frequencies of authored papers per author, institution and country were generated using VosViewer software, while the number of publications per year as well as publication sources was obtained based on an analysis of the data using Microsoft Excel.

5 Results and discussions

The results of the study are presented in this section according to the salient themes of the topic of this study.

5.1 Publication pattern and trend of knowledge management research in E&SA region, 1991-2016

Figure 1 shows the pattern and trend of KM publications per year for the period under analysis. A total of 3,681 publications were published during the period under study. The number of publications per year varied from 7 to 518. It was observed that the number of publications stagnated between the years 1991 and 1992. A very slow growth rate was observed from 1993 to 2000. However, there was a significant steady increase in the number of publications from 2001 to 2014, with a sudden significant surge in the year 2015. Notwithstanding the variance in the number of publications, the results reveal a positive trend in the entire period under study.

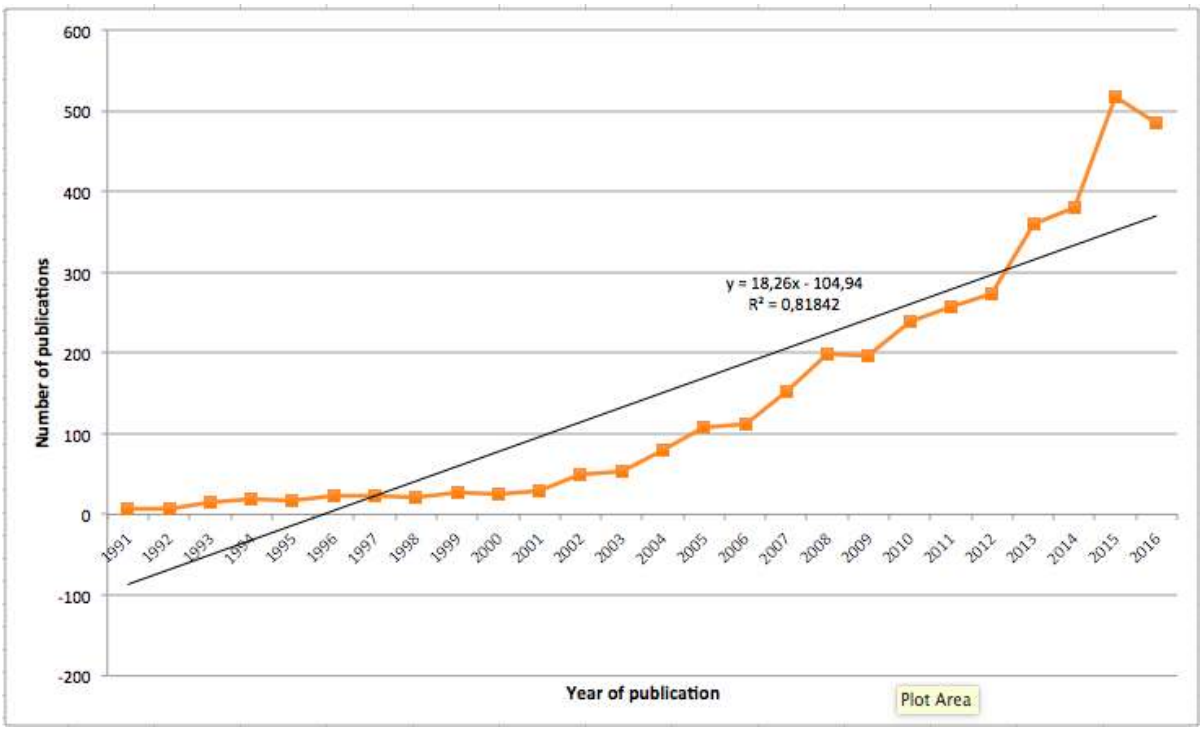

Figure 1: Trend of publication of KM research in Eastern and Southern Africa, 1991-2016

This finding is important in the field of knowledge management because it reveals a growing trend of publications per year and the number of researchers interested in the field of KM. Evidently, the finding implies a growing trend towards multi-authored publications, hence attracting an increase in KM research productivity.

5.2 Producers of knowledge management research in E&SA region, 1991-2016

This thematic topic presents the findings on the researchers or producers (i.e. authors, institutions and countries) of KM research in E&SA region in order to, among others goals, explain the geographical distribution of KM research in the region.

5.2.1 Distribution by authors

Table 3: Top 25 authors of KM research in Eastern and Southern Africa, 1991-2016

No.	Author Name	No of publications	% of 3681	Country of affiliation
1	Engelbrecht, A.P.	89	2.42	South Africa
2	Marwala, T.	60	1.63	South Africa
3	Meyer, T.	37	1.01	South Africa
4	Keet, C.M.	20	0.54	South Africa
5	Aldrich, C.	19	0.52	South Africa
6	Nelwamondo, F.V.	19	0.52	South Africa; USA
7	Twala, B.	18	0.49	South Africa
8	Britz, K.	17	0.46	South Africa
9	Mavetera, N.	17	0.46	South Africa
10	Abraham, A.	16	0.43	Sudan; USA
11	Kroeze, J.H.	14	0.38	South Africa
12	Pillay, N.	14	0.38	South Africa
13	Schmitt, U.	14	0.38	South Africa
14	Von Solms, R.	14	0.38	South Africa
15	Winschiers-Theophilus, H.	14	0.38	Namibia
16	Xing, B.	14	0.38	South Africa
17	Meshesha, M.	13	0.35	Ethiopia
18	Pretorius, M.W.	13	0.35	South Africa
19	Van Belle, J.P.	13	0.35	South Africa
20	Buckley, S.	12	0.33	South Africa
21	Folly, K.A.	12	0.33	South Africa
22	Mbohwa, C.	12	0.33	South Africa
23	Ngulube, P.	12	0.33	South Africa
24	Oerlemans, L.A.G.	12	0.33	South Africa; Netherlands
25	Bright, G.	11	0.30	South Africa

Table 3 shows, in descending order, the percentage of publications that the authors participated in, along with the country of affiliations over the period under study. The rank list of the prolific authors on KM productivity has been derived on the basis of the number of publication contributed as well as authors' affiliations. The most productive authors, Engelbrecht, A.P., Marwala T. and Meyer T. have an output that surpasses 30 publications, comprising roughly 5.15% of the total publications. This represents a strong pattern of author productivity and may be attributed to the number of publications per author.

Our data also shows that the total sum of 22 authors of the top 25 authors originate in South Africa or are affiliated to institutions from South Africa. This may be attributed to

the fairly stable KM research patterns and trends in South Africa and/or institutions from that country.

5.2.2 Distribution by institutions

Table 4: Top 25 institutions producing KM research in Eastern and Southern Africa, 1991-2016

No.	Affiliation	No. of publications	% of 3681	Country of affiliation
1	University of Pretoria	428	11.63	South Africa
2	University of Cape Town	377	10.24	South Africa
3	University of Johannesburg	251	6.82	South Africa
4	University of KwaZulu-Natal	245	6.66	South Africa
5	Universiteit Stellenbosch	231	6.28	South Africa
6	University of South Africa	193	5.24	South Africa
7	University of the Witwatersrand	187	5.08	South Africa
8	The Council for Scientific and Industrial Research	177	4.81	South Africa
9	Tshwane University of Technology	116	3.15	South Africa
10	North-West University	112	3.04	South Africa
11	University of Botswana	100	2.72	Botswana
12	Nelson Mandela Metropolitan University	95	2.58	South Africa
13	Makerere University	82	2.23	Uganda
14	Meraka Institute	79	2.15	South Africa
15	Addis Ababa University	77	2.09	Ethiopia
16	Rhodes University	75	2.04	South Africa
17	University of the Western Cape	71	1.93	South Africa
18	University of the Free State	50	1.36	South Africa
19	Cape Peninsula University of Technology	47	1.28	South Africa
20	University of Nairobi	46	1.25	Kenya
21	University of Mauritius	44	1.20	Mauritius
22	Durban University of Technology	43	1.17	South Africa
23	Khartoum University	30	0.81	Sudan
24	Namibia University of Science and Technology	29	0.79	Namibia
25	University of Zimbabwe	28	0.76	Zimbabwe

The rank list of the institution-wise KM productivity has been derived on the basis of the number of publications from each institution. Of the all the institutions where KM research output originated, we see in Table 4 that the top 25 institutions produce 3,213 publications in the period under study. The University of Pretoria is the leading source of KM publications, with nearly 12% of the total output, and the University of Cape Town, with over 10%. Following them, the most productive institution would be

the University of Johannesburg and the University of KwaZulu-Natal, with nearly 7% contributions to output respectively.

Our data also shows that most of E&SA region's KM research productivity is carried out in higher institutions of learning. Out of the top 25 institutions producing KM research, approximately 80.4% of the total publications can be traced to higher institutions of learning, which is much higher than the research output from research centres or the corporate sector.

5.2.3 Distribution by countries

Table 5: Top 25 countries producing KM research in Eastern and Southern Africa, 1991-2016

No	Country/Territory	No of publications	% of 3681
1	South Africa	2753	74.79
2	United States	320	8.69
3	United Kingdom	267	7.25
4	Kenya	232	6.30
5	Ethiopia	136	3.69
6	Germany	125	3.40
7	Netherlands	125	3.40
8	Botswana	123	3.34
9	Uganda	123	3.34
10	Sudan	101	2.74
11	Tanzania	101	2.74
12	Australia	98	2.66
13	Canada	85	2.31
14	Italy	76	2.06
15	France	75	2.04
16	Mauritius	67	1.82
17	Namibia	67	1.82
18	Sweden	66	1.79
19	Zimbabwe	65	1.77
20	Belgium	59	1.60
21	India	58	1.58
22	Malawi	51	1.39
23	China	47	1.28
24	Switzerland	44	1.20
25	Brazil	39	1.06

The rank list of the country-wise KM productivity has been derived on the basis of the number of publications from each country. In the period under study, 40.32% of the publications analysed correspond to the international individual contributions and or

collaborative efforts. This rate represents a total of 14 main foreign countries out of the top 25 countries producing KM research, namely: United States, United Kingdom, Germany, the Netherlands, Australia, Canada, Italy, France, Sweden, Belgium, India, China, Switzerland and Brazil. There are noteworthy growth patterns and trends of KM production within E&SA region. For instance, South Africa alone produced nearly 75% of the total publications, followed by Kenya with 6.3% of the total publications analysed over the period under study.

However, if we relate this productivity or distributions by country indicator between the main foreign countries and local countries in the region of this study, we find that KM research reflects a more stable trend in the main foreign countries than in the local countries within the period of this study, as a result of their international contributions and collaborative efforts.

5.3 Avenues or sources disseminating knowledge management research in E&SA region 1991-2016

This thematic topic presents the findings according to the document types and proceeds to provide the distribution of publications according to the avenues or sources which publish KM research that is produced in E&SA region during the period under investigation.

5.3.1 Document types in KM research

5.3.1.1 KM research production for all document types in KM research

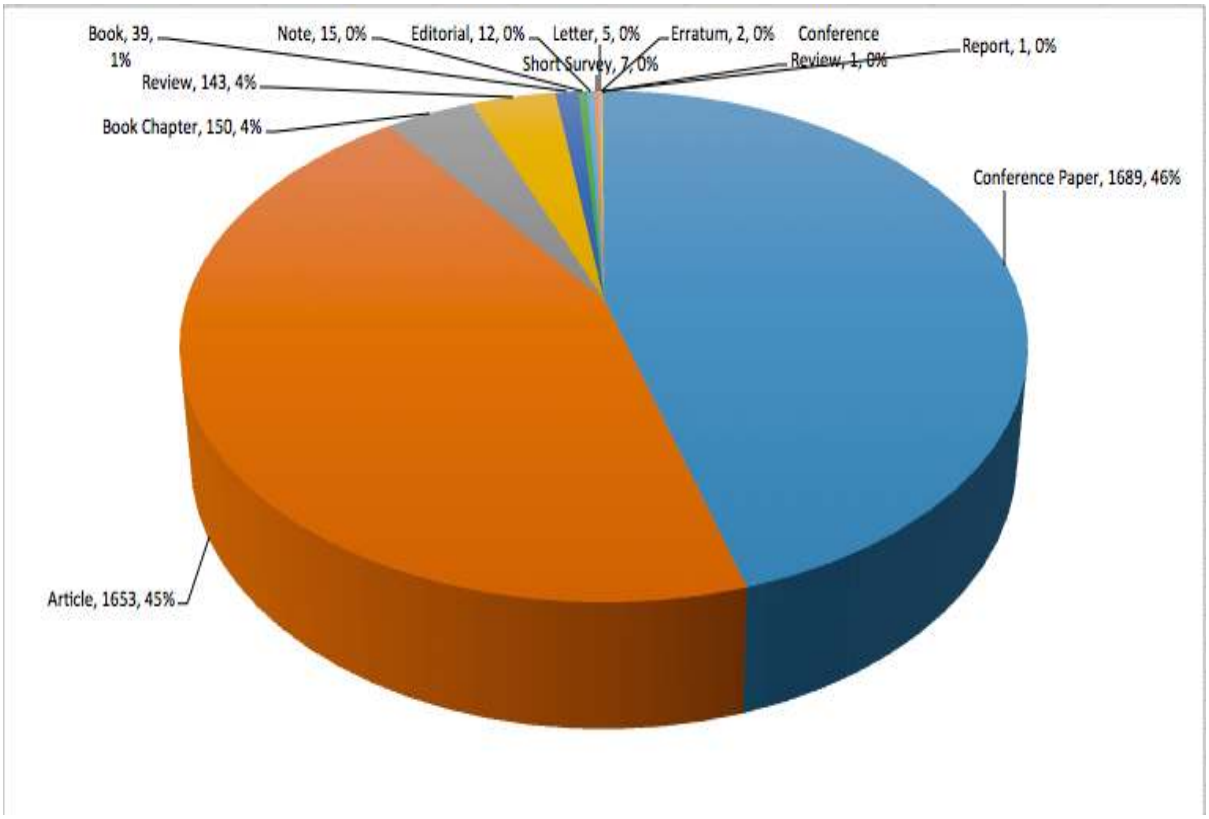

Figure 2: Document types in KM research in Eastern and Southern Africa, 1991-2016

Figure 2 shows the document types in which KM research is published. The document types include articles, book chapters, books, notes, editorial, letters, short surveys, errata, reviews, conference reviews, reports and conference papers. The predominating document type is conference papers (1,689 publications), followed by journal articles (1,653 publications). Even though the conference papers predominate in the KM research, it is important to note the low number of reviews (i.e. 4%) and the conference paper reviews (i.e. <0.5%) on the subject.

During the period under study, over 99% of the research output was in the form of conference papers (46%), articles (45%), book chapters (4%), reviews (4%), books (1%) and conference reviews (0%). However, the findings of the study revealed

variations in the production of publications by document types over the years under study (see Figure 3 for the dynamics of KM research production for articles and conference papers).

The varying trends in document types could have implications for research by enriching the thematic profile of KM productivity. This may be attributed to the multi-disciplinary nature of KM. In addition, there are cross-cutting debates about KM in every sector, resulting in KM research outputs being listed in several document types (see Figure 2).

5.3.1.2 KM research production for articles and conference papers

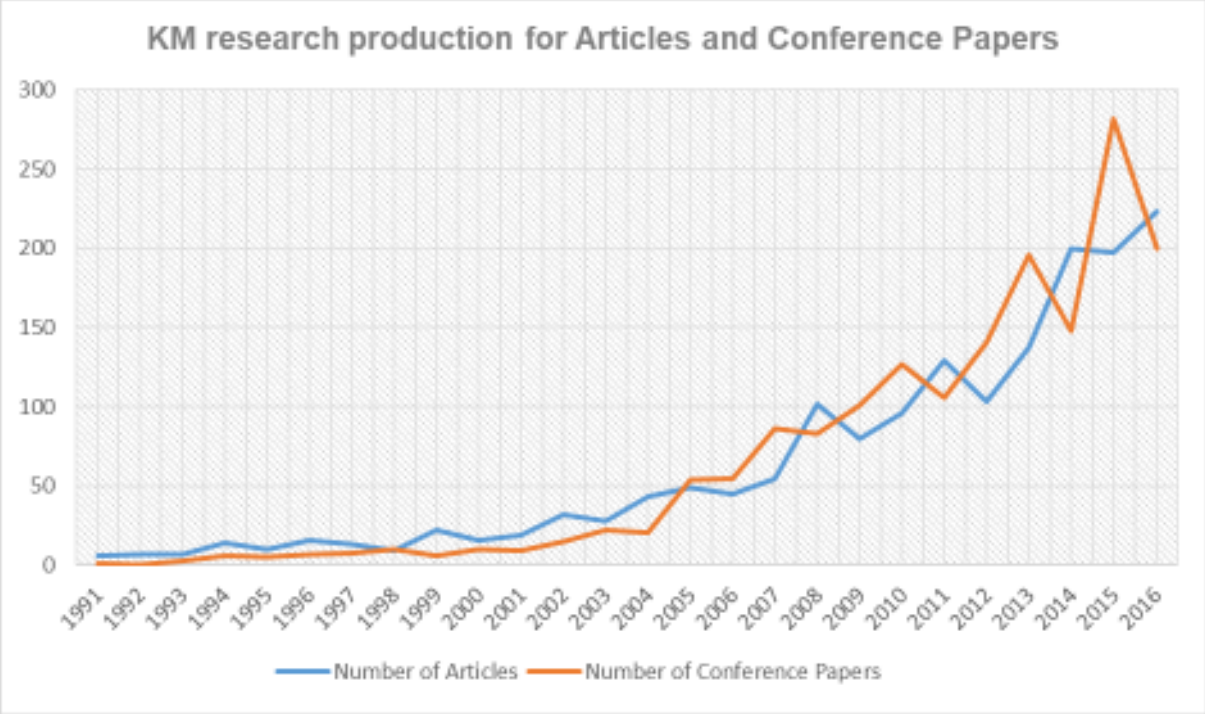

Figure 3: The dynamics of KM research production for articles and conference papers

The dynamic distribution and publications presented in Figure 3 show the dynamics of KM research production separately for journal articles and conference papers. The results reveal a strong positive trend for articles as document type between the years 1991 and 2004, and a strong negative trend in the same period and a rapid increase in the year 2005 onwards for conference papers as document type as compared to article document types. The analysis in FIgure 3 is unique because the researcher

wanted to understand the trends in detail on KM research production as shown from FIgure 2 that related to articles and conference papers for the entire period under investigation as these were the most highly preferred document types in KM research.

5.3.2 Sources publishing KM research

Table 6: Top 25 Sources publishing KM research produced in Eastern and Southern Africa, 1991-2016

Source Title	No. of publications	% of 3681
Lecture notes in computer science (including subseries lecture notes in artificial intelligence and lecture notes in bioinformatics)	194	5.27
ACM international conference proceeding series	78	2.12
Mediterranean journal of social sciences	33	0.90
IEEE Africon conference	28	0.76
Physics and chemistry of the earth	28	0.76
Electronic library	27	0.73
Advances in intelligent systems and computing	25	0.68
Communications in computer and information science	25	0.68
International journal of information management	17	0.46
Water SA	17	0.46
Computers and security	16	0.43
Ceur workshop proceedings	15	0.41
IFIP advances in information and communication technology	15	0.41
Plos one	15	0.41
South African journal of industrial engineering	15	0.41
International journal of medical informatics	13	0.35
Perspectives in education	13	0.35
South African journal of science	13	0.35
Information development	12	0.33
Minerals engineering	12	0.33
Aslib proceedings new information perspectives	11	0.30
Journal of engineering design and technology	11	0.30
Journal of information and knowledge management	11	0.30
African journal of library archives and information science	10	0.27
Corporate ownership and control	10	0.27

The total number of sources where a total of 3,681 publications were published came to 139. A rank of the top 25 sources/journals publishing KM research was listed on the basis of the number of publications contributed as shown in Table 6. Outstanding among them is the output in Lecture notes in computer science (including subseries lecture notes in artificial intelligence and lecture notes in bioinformatics), where roughly 5.3% of the total publications appears. The rest of the sources are at a great distance in terms of the volumes of KM research output, and nearly 95% of the sources show fewer than 78 publications per source title involving KM research in E&SA region, over the study period.

5.4 Summary, discussions and conclusions of the major findings

The study yielded a total of 3,681 KM publications published between 1991 and 2016. It was observed that the number of publications is not consistent and varies from year to year. The minimum number of publications per year was seven (7) while 518 was the highest. The number of publications stagnated between 1991 and 1992, with a slow growth rate from 1993 to 2000. There was a significant, steady increase in the number of publications from 2001 to 2016. There was a sudden significant surge in the year 2015, accounting for roughly 14.1% of the entire sample with a small reduction in the number of publications comprising roughly 0.9% in 2016. These results support the findings by Kumar and Mohindra (2015); Akhavan, Ebrahim, Fetrati and Pezeshkan (2016) and Sedighi and Jalalimanesh (2017), which found significant positive patterns and trends in KM publications due to the subject's increased attention and relevance, thus demonstrating its ongoing value in scholarly communication.

The most productive authors, Engelbrecht, A.P., Marwala T. and Meyer T. have outputs that surpass 30 publications, comprising roughly 5.15% of the total publications. Most of these publications are recent research outputs, thus denoting that the leading authors are still publishing in the domain. This represents a strong pattern of author productivity. Productive authors is a critical indicator associated with productivity. In contrast, if we relate this indicator with the overall KM research output

pattern and trend depicted in Figures 1 and 3, it is difficult to attribute the increased number of publications to single authors.

Our data also shows that the total sum of 22 authors from the top 25 originate in South Africa or are affiliated to institutions from South Africa. This may be attributed to the researchers' individual or collaborative efforts with world-wide institutions, solid research policy as well other support provided for in the country of origin or affiliation. This finding contradict Qiu and Lv (2014)'s observation that research on KM has been published with author-affiliations from world-wide institutions.

We have further noted that author-productivity is prevalent during the period under study. This demonstrates fairly stable KM research trends in South Africa and/or affiliated institutions. The authorship and productivity indicators reflect a coherent relationship throughout the period under study, consequently, constituting the bulk of KM research output. Previous studies such as Qiu and Lv (2014) have reported that authors affiliated to world-wide institutions largely publish research outputs in different journals.

With respect to the institutions producing KM research in the E&SA region, our data shows that the majority of the institutions with affiliations to South Africa led in the KM research output. This finding indicates that these institutions originate from South Africa and are among the most highly ranked universities in Africa.

According to Sooryamoorthy (2009), different ranking systems such as the Times Higher Education World University Ranking (THE), Webometrics Ranking of World Universities (WRWU) and Shanghai's Academic Ranking of World Universities (ARWU) have been used to assess the top institutions worldwide. These aforementioned ranking systems reveals that South African institutions take the top ten positions in sub-Saharan Africa, a situation that may be attributed to a solid research policy, the intensity of research collaboration/productivity and other support provided for in the country of origin or affiliation. Previous studies such as Serenko, Bontis, Booker, Sadeddin, & Hardie (2010); Kokol, Zlahtic, Zlahtic, Zorman, and

Podgorelec (2015) have reported that the most productive institutions come from the most productive countries. These institutions dominate the KM research field.

Similarly, in the period under study, 40.32% of the publications analysed correspond to the international contributions and collaborative efforts. This rate represents a total of 14 main foreign countries of the top 25 countries producing KM research. However, if we relate this productivity or distributions by country indicator between the main foreign countries and local countries in the region of this study, we find that KM research reflects a more stable trend in the main foreign countries than in the local countries within the period of this study, as a result of their international contributions and collaborative efforts. Previous studies such as Sooryamoorthy, R. (2009) assert that productivity or distribution increases with an increase in the nature and degree of collaborations. For instance, the higher the number of authors, institutions and/or countries involved in KM research production or distribution, the more stable the field of KM becomes. Thus, KM productivity or distribution is an important factor in this growth and stability in the field of KM.

There are noteworthy growth trends of KM production within E&SA region. For instance, South Africa alone produced nearly 75% of the total publications, making it the top country with KM research output. Kenya followed closely with 6.3% of the total publications in the period under study. This may be attributed to the growing number of publications published in or affiliated to South Africa. The country also leads other countries in Africa in terms of research performance.

In terms of document types, the most productive source titles were categorised as both conference papers (1,689 publications) and journal articles (1,653 publications). Our data shows that the publication dynamic of articles had shown a strong positive and stable trend/growth between 1991 and 2004 as compared to the publication dynamic of conference papers which showed a strong negative trend in the same period and a rapid increase in the year 2005 onwards, making the production more stable as compared to the dynamics of article production in the same period. This analysis of document types pointed out that having a large number of conference papers attest to ongoing research in the discipline, and consequently its rapid

development. Previous studies such as Kokol, Zlahtic, Zlahtic, Zorman, and Podgorelec (2015) reported a large number of conference papers produced which was attributed to both the formation of the body of knowledge and the growth rate in the KM discipline.

In terms of avenues or sources publishing KM research, there were a total of 139 sources that published 3,681 publications. The average number of publications per source is roughly 27. The number of publications per source denotes the growth and productivity of KM research (or the lack thereof). The growth rate of sources of KM research has been increasing steadily, with most KM publications being published across disciplines. This may be attributed to the availability of a variety of sources for researchers to publish their papers.

5.5 Recommendations

In order to increase the production of these publications, there is a need to organise local and international conferences in E&SA region regularly, during which researchers and other scholars can have an opportunity to present their findings, exchange ideas and identify other researchers from the region with whom they can collaborate.

Reputable avenues or sources publishing KM research outputs represent key research outlets for scientific communication. In this regard, it is highly recommended that authors, researchers or publishers should publish their findings in recognised channels so as to improve the visibility and impact of these publications. They should particularly consider using quality Open Access (OA) journals.

In addition, in order to increase the production of KM research outputs, it is highly recommended that practitioners and institutions other than the academics responsible for this study's finding of approximately 80.4% of the total publications, should conduct KM research in their business processes and management landscape in order to contribute to this growing body of knowledge, since their research output is not visible in the field.

Finally, we recommend further research to assess, among others, the types of channels used to publish KM research and the subject content of KM research, major producers as well, and carry out the impact analysis of KM research in E&SA region and beyond.

5.6 The study implication and novelty

The finding of this study can influence the development of knowledge production and collaboration policies between countries as well as the institutions of higher learning.

Countries and institutions can use the findings of this study to develop policies on collaboration, knowledge sharing and transfer, and knowledge management training programmes.

Even though knowledge management is being embraced throughout the region, little is known about its production patterns and dissemination avenues. Therefore, this study sought to examine the production patterns and dissemination avenues in knowledge management research in Eastern and Southern Africa (E&SA) region as indexed in Scopus database for the period 1991-2016 using bibliometric research techniques. The study revealed increased knowledge management research outputs through contributions and collaborative efforts among authors, institutions and countries, both at the local and international levels. Most of these publications were published across disciplines, with the most productive source titles categorised as both conference papers and journal articles.

5.7 Reference

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