

THE DIFFUSION OF SOCIAL NETWORKING TOOLS IN AFRICA: A BIBLIOMETRIC EXPLORATIVE STUDY

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Abstract

This paper was aimed at assessing the diffusion of social media in Africa in the last decade. The paper investigated the total production of social networking technology-related publications by African researchers and the key fields in which social networking technologies were applied in Africa (e.g. library and information science, health, political science, etc.). Furthermore, the paper investigated the adoption of social networking technologies in higher education institutions (universities) and the diffusion of social networking technologies knowledge through collaboration among these institutions. The paper extracted articles and reviews from Google Scholar which are authored by African scientists between 2004 and 2015. Bibliometrics techniques were used to establish research productivity, trends, communication channels preferred by African researchers, levels of collaboration among researchers, the most prolific institutions, and the disciplines actively involved in social media research.

Keywords: Diffusion; Social media; Africa; Bibliometrics

1. Introduction

The world is developing at an accelerated speed and one of the vehicles driving this development is information and communication technology. Social networking is one of the offshoots of technological advancements in information and communication technology.

With the world in the midst of a social media revolution, it is more than obvious that communication between scholars and other groups of people has been enhanced. This online sharing of information does not only promote the increase in the communication skills among the people but most importantly has enabled more people to write, publish and share their work.

2. Statement of the problem

Much research has been done on social media technologies and majority of the scholars have focussed more on finding out the mostly used social media's and the effectiveness of using them. However, no similar study of this nature is known to have been conducted to evaluate the research trends in Africa by identifying the most prolific African researcher institutions and the disciplines mostly actively involved in the social media research; hence the need to try and fill in this gap.

3. Significance of the study

It is hoped that the results of the study will enlighten people on the research trends of African researchers hence help in facilitating the encouragement of other writers to concentrate more on the less researched areas.

4. Study Objectives

The main aim of this study is to investigate the diffusion of social media in Africa. The specific objectives of the study are:

- To explore research productivity trends by African scientists
- To investigate the document types produced by the researchers
- To investigate the collaborative patterns of the researchers
- To identify the disciplines most actively involved in social media research

5. Research Methodology

A descriptive survey research design was used. The population of the study consisted of social networking tools related publications that have been written by African researchers from 2004 to 2015. The Bibliometric techniques were used in this study as they aim at helping in evaluating networks of scholars, the links between them, help in measuring scientific publications and the development of areas of knowledge over a period of time which this paper sought to do. Therefore, this method helped to explore the research trends from 2004 to 2015. Google Scholar was used to search the Internet/WWW to extract publications produced by African researchers. Data collected was cleaned to remove duplicates and served on MS Excel spread and later exported to SPSS 20 for further bibliometric statistical analysis.

6. Limitations of the study

The limitations of this study were based on the fact that the data collected for this study was from 2004 to 2015 which could compromise the findings of the research hence have a bigger impact on the generalisation of the results considering that no data was collected from the previous years. Furthermore, only publications retrieved using Google Scholar in the period January 2-15 2016 were analysed.

7. Results

A hundred and eighty-seven publications were obtained from various information resources on the Internet (AJOL and Google Scholar).

7.1 Yearly Distribution of Research Output

Table 1 shows the yearly research output from 2004 to 2015. A total of 187 scholarly papers were published within the period under review. Not surprisingly, the lowest number of papers published was recorded in the first two years, 2004 and 2005 while recent years show the highest number of papers per year. Table 1 reveals very slow gradual increasing research productivity over the period 2004-2010, while the period 2011-2015 is characterized by a steady upward step

like increase with a sudden drop in 2014 and 2015 which may have been affected by time lag in publishing as it is possible that some of the research done during this period might not have been published at the time of data collection).

	Frequency	Percent	Cumulative Percent
2004	1	.5	.5
2005	1	.5	1.1
2008	2	1.1	2.1
2009	5	2.7	4.8
2010	7	3.7	8.6
2011	22	11.8	20.3
2012	30	16.0	36.4
2013	52	27.8	64.2
2014	42	22.5	86.6
2015	25	13.4	100.0
Total	187	100.0	

Table 1: Yearly distribution of publications

7.2 Types of publications

Table 2 below shows that the majority (86.8%; 157) of the African researchers preferred to disseminate their research on social media through journals as articles. This was followed by conference papers (8.2%; 16), and thesis both at Master’s degree and PhD levels (4.8%; 9) Two (1.1%) researchers have disseminated their research through books and another two (1.1%)

	Document type						Total
	Journal article	Conference paper	Thesis	Book	Book chapter	Technical report	
2004	1	0	0	0	0	0	1
2005	1	0	0	0	0	0	1
2008	2	0	0	0	0	0	2
2009	5	0	0	0	0	0	5
2010	5	1	1	0	0	0	7
2011	13	3	2	1	1	2	22
2012	22	8	0	0	0	0	30
2013	49	2	0	1	0	0	52
2014	36	1	5	0	0	0	42
2015	23	1	1	0	0	0	25
Total	157	16	9	2	1	2	187

Table 2: Types of publications and their yearly distribution

through technical reports while only one researcher disseminated his/her research through a book chapter. Table 2 further shows the research publication trends regarding the type of publication preferred by the researchers. On one hand, journal articles have dominated the types of publications produced by African researchers during the whole 11 year period. On the other hand, the highest number of conference paper presentations was recorded in 2012 while the highest number of thesis publications were produced in 2014. Four of the conference papers were presented at IFLA while five were presented at SCECSAL (Kenya) in 2012, respectively.

7.3 Collaboration levels

Research collaboration is commonly measured by co-authorship of publications (Katz & Martin, 1997; Onyancha and Ocholla, 2007; Onyancha, 2009). Several studies have employed this technique to measure research collaboration in different countries and/or institutions, e.g. (Hartinah, Davis, Hydari & Kent, 2001; Lewison & Must, 2001; Narvaez-Berthelemot, Russell, Arvanitis, Waast & Gaillard, 2001). Some of the approaches of measuring research collaboration are: determining (a) the number of papers that are single- and/or co-authored; (b) the number of papers that are authored by x number of authors each; (c) the proportion of multi-authored papers, called the degree of collaboration (DIC) by Subramanyan (1983). More refined methods can be found in (Ajiferuke et al., 1988) and (Egghe, 1991).

Table 3 shows the authorship patterns of the African researchers. Most (36.9%) of the publications were of single authorship; 29.4% were two-authored, 28.9% were three-authored, 3.2% were four-authored; 1.6% of the publications were authored by more than four authors. The results show that majority (63.1%) of the publications on social media were products of collaborative research. These results have revealed that African researchers on social media collaborative on a high degree.

	Frequency	Percent	Cumulative Percent
1	69	36.9	36.9
2	55	29.4	66.3
3	54	28.9	95.2
4	6	3.2	98.4
5	1	.5	98.9
8	2	1.1	100.0
Total	187	100.0	

Table 3: Number of authors per publication

Further analysis was conducted to establish the degree of collaboration (collaboration coefficient) among the African researchers, using the formula (Subramanyan, 1983):

$$C = \frac{Nm}{Ns}$$

Where C=collaboration coefficient, N_m = number of multi-authored publications, and N_s = number of single-authored publications.

The result was 0.63. This result reveals that there is fairly high degree of collaboration among African research regarding social media related issue. Figure 1 shows that the early years 2009-2015 were dominated by multi-authored publications, marked by a steady increasing of two-authored and three-authored publications (Table 4). An examination of the degree of collaboration (DIC) reveals that there is an increasing collaboration over the years, from 0.00 in 2004 to 0.64 in 2015. Highest collaboration was recorded in 2014 at 0.69.

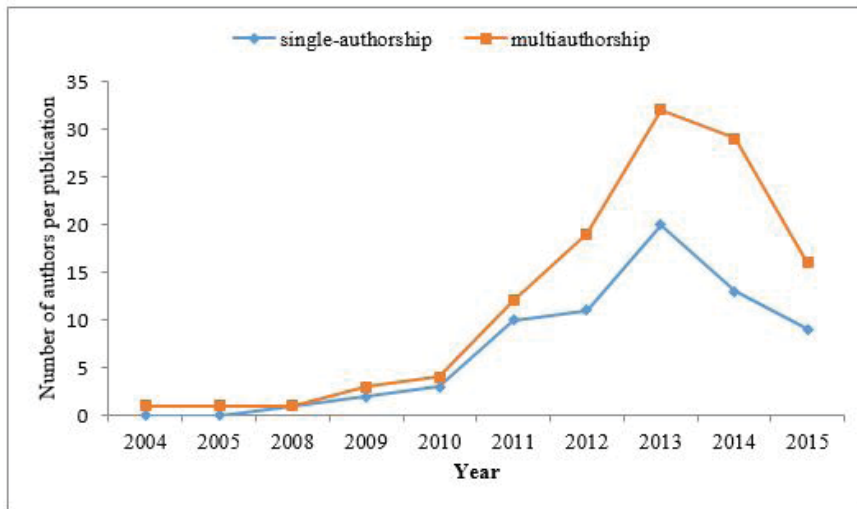


Figure 1: Author collaboration trends 1966-2015

7.4 Mostly productive institutions

Table 5 presents the distribution of research output on social media by types of institution. The major institutions actively involved in social media research are university (82.8%), college/polytechnic (11.1%), and others (NGOs, business entities, etc.). There was collaboration at institutional level with a collaboration coefficient (CC) of 0.31.

	Frequency	Valid Percent	Cumulative Percent
University	202	82.8	82.8
College/Polytechnic	27	11.1	93.9
Others (NGOs, Business sector, etc.)	10	4.1	98.0
Government organization	4	1.6	99.6
Research institute	1	.4	100.0
Total	244	100.0	

Table 5: Productive institutions in social media research

Three hundred and eighty-six researchers affiliated to 244 institutions were involved in the production of the 187 publications which were retrieved for this study. Table 6 shows 14 most African productive institutions in social media researched. These institutions produced 41.2% of

the research on social media. They are University of Nigeria, University of Pretoria, University of KwaZulu-Natal, University of South Africa, Nnamdi Azikiwe University, University of Ibadan, University of Cape Town, Anambra State University, Kogi State University, Redeemer's University, University of Ilorin, Babcock University, Delta State University, Federal Polytechnic, Federal University, Federal University of Technology, Muhimbili University of Health and Allied Sciences, Nigerian Institute of Mass communication, University of Stellenbosch, University of the Witwatersrand, and University of Uyo.

Rank	Institutions	Frequency	Percent	Cumulative Percent
1	University of Nigeria	10	4.1	4.1
2	University of Pretoria	9	3.7	7.8
3	University of KwaZulu-Natal	8	3.3	11.1
	University of South Africa	8	3.3	14.3
4	Nnamdi Azikiwe University	7	2.9	17.2
	University of Ibadan	7	2.9	20.1
5	University of Cape Town	6	2.5	22.5
6	Anambra State University	4	1.6	24.2
	Kogi State University	4	1.6	25.8
	Redeemer's University	4	1.6	27.5
	University of Ilorin	4	1.6	29.1
7	Babcock University	3	1.2	30.3
	Delta State University	3	1.2	31.6
	Federal Polytechnic	3	1.2	32.8
	Federal University	3	1.2	34.0
	Federal University of Technology	3	1.2	35.2
	Muhimbili University of Health and Allied Sciences	3	1.2	36.5
	Nigerian Institute of Mass communication	3	1.2	37.7
	University of Stellenbosch	3	1.2	38.9
	University of the Witwatersrand	3	1.2	40.2
	University of Uyo	3	1.2	41.4

Table 6: Most productive institutions

7.5 Disciplines Most Actively Involved in Social Media Research

Table 8 shows the major disciplines actively involved in social media research in Africa in the past 11 years. Leading this table, the disciplines with a percentage higher than 5, are: library and information science (27.8%), mass communication and related fields (24.1%), political science (12.8%), commerce and related fields (11.2%), education (7.5%), and health sciences (5.3%). Other disciplines include computer science, sociology, agriculture, languages and literature, law, psychology, and religious studies.

	Frequency	Percent	Cumulative Percent
Library and information science	52	27.8	27.8
Mass communication	45	24.1	51.9
Political science	24	12.8	64.7
Commerce and economics	21	11.2	75.9
Education	14	7.5	83.4
Health sciences	10	5.3	88.8
Computer science	9	4.8	93.6
Sociology	7	3.7	97.3
Agriculture	1	.5	97.9
Language and Literature	1	.5	98.4
Law	1	.5	98.9
Psychology	1	.5	99.5
Religious and Cultural Studies	1	.5	100.0
Total	187	100.0	

Table 8: Disciplines mostly in which social media research is mostly applied

7.6 Key Findings

- This study has shown that African research output on social media during the period 2004-2015 has steadily been increasing. The study found that 171 of 187 publications were produced between 2011 and 2015 (i.e. 91.44%).
- The most prolific research authors were associated with the universities (82.8%), followed by colleges/polytechnics (11.1%).
- The majority of the research output document types were journal articles (83.96%), followed by conference papers (8.56%), and theses (4.81%). Together these constituted 97.33% of the publications.
- Analysis of the disciplines most actively involved in social media research indicated that library and information science (27.8%), is the dominant discipline, followed by mass communication (24.1%), political science (12.8%), commerce and economics (11.2%), education (7.5%), and health sciences (5.3%).
- Evaluation of research communication channels indicated that journals were the most used communication channel for the dissemination of social media research followed by professional conferences.
- Co-authorship patterns and collaboration trends show that more than 63.1% of the publications were co-authored. The last years of the period under review (2009-2015) were dominated by multi-authored publications with most of the publications being authored by 2-3 authors.
- Our findings show that African researchers collaborate with a small community of researchers outside the African continent from a number of countries worldwide. Topping the list are the USA (5.3%) and England (2.1%), followed at some distance by Canada (1.6%) and Malaysia (1.6%).

- Citation analysis provides evidence that 63.3% of the publications have been cited at least once, leading to a total of 22,720 citations. The other 36.7% were not cited, at least not in Google Scholar. This does not mean that they were not cited at all, or did not have any influence as they can be cited in other sources, or used but not cited.

8. Discussion and Conclusion

It should be noted that although this study may not have collected comprehensive data due to heavy reliance on Google Scholar, data derived from this database are able to draw an acceptable picture of the status of social media research in Africa. On the other hand, this proves that the advent of the Internet and the World Wide Web have provided tremendous opportunities for African research to made more visibility at international levels. Availability of such tools like Google Scholar has also made it most for African researchers to evaluate the impact of their research.

This study has demonstrated that social media has attained a prominent position on the research agenda of the African research community, clearly indicating the rapid adoption and diffusion of the technology on the African continent. This may be due to the opportunities social media/social networking tools provide in provision of improved services in various sectors such as library and information services, banking, agriculture, education, etc. The social media concept has attracted a variety of researchers from different disciplines including library and information science, commerce and economics, computer science, agriculture, and education. The adoption rate of the concept in Africa is reflected in the rapid growth of numbers of researchers, institutions, and sources that publish literature on social media. This study has also demonstrated the important role journals and conferences play in the dissemination and adoption of knowledge and technology.

Growth of publications on social media in Africa has continued to be on an upward trend since 2004. The high level of involvement in institutions of higher education also demonstrates the increasing inclusion of social media in curricula in African universities. This has resulted in increasing research at postgraduate levels. Social media has increasingly become an agenda item at professional conferences particularly at IFLA and SCECSAL.

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