

Citation Frequency of Research Output of Academic Librarians in Federal Universities in South Nigeria Using Google Scholar

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Abstract

The World Wide Web has become an outstanding tool for the collection and dissemination of scholarly Information, and web indicators are designed not only to monitor the presence and impact of an individual or an organization in an online space but to promote a more open, global, societal, and detailed knowledge of the scholars' organization, activities and results. As such, citing the publications of academicians and linking each cited work to its abstract or the full paper provides a rather economical means of making such works accessible to others while improving the ranking profile of the University where such scholars belong. In order words, such scholars and their institutions become discoverable and visible to the wider Web audience. The paper examines the citation frequency as well as the h-index of the research output of academic librarians in federal Universities in the South-South region of Nigeria. Using Google Scholar, information was sort for 104 academic librarians from the five respective institutions in the region. Findings indicates a not so encouraging citation frequency as well as very low level of research impact arising from the h-index, thus implying relatively poor research output of academic librarians across institutions in the studied region. In the light of this finding, academic librarians are therefore encouraged to deposit outputs of their research in institutional repositories. University management should for all practical purposes expose their academic librarians to contemporary trainings/workshops on current trends in research methods and on-line publishing.

Key words: citation frequency, h-index, research output, academic librarians, publications, south-south.

1.1 Introduction

Librarianship is an academic profession, therefore researchers and scholars in Library and Information Science use publications to communicate to their peers as well as assess merit for tenure and promotion. Hence, to effectively plan their roles as academics, librarians are expected to teach, conduct research, and disseminate their research findings as well as carry out other administrative duties. Agboola (2000) observes that Nigerian librarians have been active in research and publication in Africa to the extent that apart from South Africa, Nigerian University librarians enjoy prominence in the professional literatures. Such prominence is meant to attract a wider audience for citation. As such, it is therefore imperative that these research outputs which is meant to address issues that are endemic to the region should be given wide circulation and access so that the results of the research can be applied in addressing the issues which they sought to address.

Research output according to Zainab (2001) is an outcome of research which appears in print and is usually embodied in research communications in the formal sense. Similarly, Edem (2004) defined research output as the number of books, chapters in books, journal articles and other related research output such as bibliographies, abstracts and indexes that are published.

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From the above, it can be deduced that research output as used here in this study therefore, is expressed by the entirety of researches conducted by academic librarians in their respective Universities in their career over a specified time frame. Holden, Rosenberg and Blaker (2005) observed that the peer-reviewed publications are the primary unit by which academic faculties and educational programmes are judged, and of course publication output is one of the major determinants of academic staff productivity (Popoola, 2008). It enables academic staff members to share insight, demonstrate academic scholarship, gain recognition for creative thinking and finally to develop a reputation for expertise in a specialty area.

In the past however, the number of publications and journal impact factors were the means to determine research ratings (Ale Ebrahim, Salehi, Embi, Habibi, Tanha, Gholizadeh, and Motahar, 2014). In recent time, rating research quality relies heavily on the number of citations per article since citation shows how many times an article has been cited by other articles (Fooladi, Salehi, Yunus, Farhadi, Aghaei, Farhadi & Ale Ebrahim, 2013).

Citations to research publications also act as a quality indicator, which is important for both the author and the affiliated University (Jones & Evans 2013). Most researchers are evaluated based upon their publications as well as the numbers of citations their publications receive. Although the number of publications is the first criteria for assessing a researcher's output, the main measurement for an author's productivity is the number of citations. A citation according to Reitz (2017), is a written reference to a specific work or portion of a work (book, article, dissertation, report, musical composition, etc.) produced by a particular author, editor, or composer clearly identifying the document in which the work is to be found while citation analysis or bibliometrics according to Otuoma, (2013) refers to quantitative analysis of research publications and influence or impact of the research work on others. This implies that the impact of a research is determined based on the number of times an article has been cited by others.

In the very recent times, evaluation of research output of scholars and, or academics has centered around numerical index quantification, and indices such as h-index, g-index and eigen factor, are now dotting the landscape of citation analysis.

During the last 14 years, the introduction of *h* index by Hirsch (2005) has provided enormous impetus in finding tools to quantify the research output of individual scientists, University faculties and research institutions. This index - introduced by Jorge E. Hirsch combines the author's article count and citation count into a single value. Hirsch states that a scientist has index *h* if *h* of his/her N_p papers have at least *h* citations each, and the other ($N_p - h$) papers have no more than *h* citations each (Hirsch, 2005). It is one of the most well-known methods of estimating publication output and impact in order to assess its validity (Birks et. al, 2014). The advantage of the h-index is that it combines an assessment of both quantity (number of papers) and quality (impact, or citations to these papers) (Glänzel, 2006). It is important to note that an academic cannot have a high h-index without publishing a substantial number of papers.

However, substantial publication by an author is not enough since these papers need to be cited by other academics in order to count for the h-index, and online visibility plays a major part in citations as people can only cite articles they see and can access. Nevertheless, a fundamental problem facing researchers in the developing world for which Nigeria is inclusive is the fact that majority of the research done lack clear online discoverability (Arunachalam, 2003). Very few of such research papers published in developing countries become citation classics or eventually find a place in the list of key papers in an emerging research front. Although academic librarians in federal Universities in South-South Nigeria engage in research and publication output like their counterparts in other parts of Nigeria as a requirement for their promotions and career advancement, it is not known whether such publication output can readily be cited on a global scale.

Therefore this research paper is an attempt to;

- 1) Determine the citation frequency of the research outputs of academic librarians of federal Universities in South-South Nigeria.
- 2) Ascertain the h-index of academic librarians of federal Universities in South-South Nigeria.

1.2 Literature

Research output is very important not only to the academic staff but also to academic institutions. It has remained an invaluable yardstick for measuring academic staff productivity and enables academic staff members to share insight, demonstrate academic scholarship, gain recognition for creative thinking and finally to develop a reputation for expertise in a specialty area. In any field of specialization, research provides current information for growth, progress and improved society. Research output in this study is viewed or defined in the light of the outcome of research involving the careful investigation of interests, with the aim of exploring existing understandings and/or seeking practical solutions to existing problems or issues which may be published or unpublished. Publication count is an indicator of research productivity and is used to rank faculties and academic institutions (Narin & Hamilton, 1996; Toutkoushian, et al., 2003; Liu and Cheng, 2005; Meho & Spurgin, 2005). In an ideal situation research outputs extend and trigger scholarly discussions between practitioners and educators, both of whom are producers and consumers of such publications.

Citations in scholarly works are used to establish links to other works and is one of the most widely used methods of bibliometrics which studies reference to and from documents (Gooden, 2001). The on-line dictionary of library and information science (2017), defines citation analysis as a bibliometric technique in which works cited in publications are examined to determine patterns of scholarly communication. Citation analysis reveals interesting information about knowledge producers in terms of their information seeking behaviour and usage of various information sources. It can highlight the familiarity, awareness and usage of knowledge producers regarding the on-line and print information sources.

Direct citation remains a main indicator of the significance of a research output rather than alternative metrics (Shotton, 2013; Priem, 2013) and the number of citations has over 20 percent share in different University ranking systems (Usher & Savino, 2007; Taylor & Braddock, 2007). Citation analysis therefore uses citations in scholarly works to establish links and many different links can be ascertained, such as links between authors, between scholarly works, between journals, between fields, or even between countries. In that way their publications can receive high citations and will reach the widest possible audience (Ale-Ebrahim et al., 2013) and one of the best ways of accessing an author's impact in the scholarly community is by using the citation frequency to ascertain the h-index.

According to Hirsch (2005), a scientist has index h if h of his or her N_p papers have at least h citations each and the other $(N_p - h)$ papers have $\leq h$ citations each. To calculate it, only two pieces of information are required: the total number of papers published (N_p) and the number of citations (h) for each paper. The index is a measure of the number of highly impactful papers a scientist has published. The larger the number of important papers, the higher the h-index, regardless of where the work was published. For instance, an h-index of 6 means that an author has published at least 6 papers that have each received at least 6 citations.

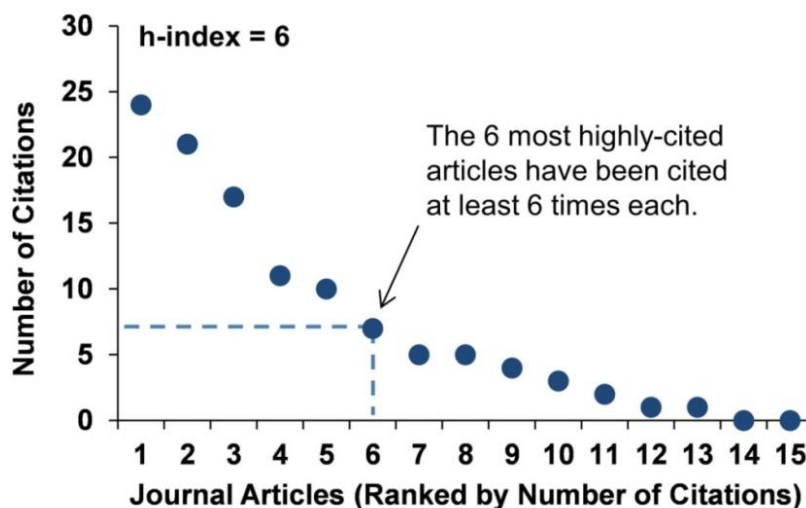


Fig 1: Author h-index

From figure 1 above, the first paper has been cited 24 times, and gives us a 1 (there is one paper that has been cited at least once). The second paper has been cited 22 times, and gives us a 2 (there are two papers that have been cited at least twice). The third paper gives us a 3 and all the way down to 6 with the sixth highest paper. The other papers have no effect in this case as they have been cited less than six times. An h index of 0 does not inevitably indicate that a scientist has been completely inactive: he or she might have already published a number of papers, but if none of the papers was cited at least once, the h index is 0.

There are several tools available for citation analysis, some are subscription-based and others are free. Each tool has its strengths and weaknesses and none of them covers the entire universe of scholarly publications. For this study, the researcher used Google Scholar which is a freely available search engine. Google scholar can be searched for citations to an individual item by conducting an advanced author search: this retrieves items published by the author in question and ranks these items by citation counts. The searcher will need to click on the "Cited by ..." link to view the documents that cite each item. In cases where an author name is very common, additional keywords (e.g., journal name or keywords in title) may be necessary to use to increase precision.

According to Noruzi (2005), Google scholar is the scholarly research tool of the world's largest and most powerful search engine, Google. A search engine is defined by Microsoft Encarta Dictionary (2017) as a computer program that searches for specific words and returns a list of documents in which they were found, especially a commercial Internet service. Google scholar, which was developed by Anurag Acharya, an Indian-born Computer Scientist is an incredible tool, allowing researchers to locate a wide array of scholarly literature on the web, including scholarly journals, abstracts, peer-reviewed articles, thesis, dissertations, books, preprints, PowerPoint presentations and technical reports from Universities, academic institutions, professional societies, research groups, and preprint repositories around the world and it is a search engine for scholarly literature covering just about any field and discipline you can think of . It differs from Google in that while Google indexes only freely available web pages, Google Scholar indexes scholarly-looking web documents that are freely available, and in addition also has documents supplied by agencies that have partnered with it (e.g. journal publishers and academic institutions) and citations extracted from indexed documents' reference lists.

An author can create a Google Scholar Citations profile based on an institutional Gmail or Google account. This has many advantages for the authors. It will make the author's profile public and increase their visibility in the most widely used search tool for academic research worldwide. Authors can obtain citation metrics to their publications and get their h-index for Google Scholar, find collaborators, and receive alerts about new publications based on keywords in their profile. To set up a Google Scholar Citation profile, an author will:

- Create / use a Gmail account and sign into Google.
- Go to Google Scholar. Make sure that he/she is signed in.
- Click on "My Citations" at the top. He/she will be prompted to create a Google Scholar citations account.
- Add the works that have been found by Google to his/her profile.
- Add other works manually.
- If the author has a common name, "Don't automatically update my profile" should be selected. Otherwise, works by other authors with the same name may be added to his/her profile.

Alternatively, a researcher's h-index can be calculated manually by locating citation counts for all published papers and ranking them numerically in descending order by the number of times the paper has been cited. Google Scholar is defined for the purpose of this research as the free on-line search engine that is used for searching scholarly materials on-line.

1.3 Method

The paper is descriptively designed. The study area is the South-South geopolitical zone of Nigeria which is made up of Cross- Rivers State, Edo State, Rivers State, Akwa-Ibom State, Delta State and Bayelsa state. Universities chosen for this study are purposively federal government universities and include; University of Uyo in Akwa-Ibom State, University of Port Harcourt in Rivers State, University of Calabar in Cross River State, Federal University Otuoke in Bayselsa State and the University of Benin in Edo State.

1.4 Population

The population of the study is 104. Comprising academic librarians, in the five federal Universities in South-South of Nigeria (see Table 1), obtained from the libraries of each institution. Sample for the study is composed of the entire population frame (104) (see Table 2); this is due to the size of the population under study. Scholars have often argued that the entire population can be studied when the population under study is relatively infinitesimal (Akuezulo and Agu, 2003).

Table 1: Distribution of Academic Librarians of Federal Universities in South-South Nigeria

S/N	Name of University	Number of Academic Librarians
1	University of Benin	15
2	University of Port Harcourt	23
3	University of Calabar	30
4	University of Uyo	25
5	Federal University, Otuoke	11
	Total	104

Table 2: Distribution of Academic staff per rank

S/N	Academic librarians	Population
1	University Librarians	5
2	Professors	3
3	Principal Librarians	2
4	Senior Librarians	27
5	Librarian 1	19
6	Librarian II	19
7	Assistant Librarian	22
8	Graduate Assistant	7
	Total	104

Data was sourced using Google Scholar to measure research output citation frequencies of academic librarians. Google Scholar is global best practice and the most reliable database measure of research productivity (Becker Guides, 2016; Library Guides, 2017). H-index was also used to measure the impact level of academic librarians research output. The index is a measure of the number of highly impactful papers a scientist has published. The h-index for the academic librarians was manually calculated because most of the librarians did not have Google Scholar profiles. The manual calculation was done on the basis of the total number of papers published (N_p) and the number of citations (h) for each paper. The names and ranks of the academic librarians were obtained from a list provided by the different Universities. The names of the academic librarians were keyed into Google Scholar search engine at www.scholar.google.com.

Each publication was opened to ascertain the affiliation as a confirmation that it belongs to the particular academic in the institutions that is being investigated. Data for this work was analyzed using descriptive statistics, including tables, percentages, charts and graphs.

1.5 Data presentation

RQ 1: What is the citation frequency of academic librarians' research output in federal Universities in South-South?

Table 3: Showing citation frequency of academic librarians in Google Scholar Database

UNIVERSITY	Number of Citations						Total Citations	No. of Publications	Citation Frequency
	UL/Professor	Snr/Principal Librarian	Librarian I	Librarian II	Asst Librarian	Graduate Asst			
University of Port Harcourt	0	105	33	0	0	0	138	45	3
University of Calabar	129	449	84	0	0	0	662	80	8
Federal University, Otuoke	31	3	5	0	0	0	39	11	4
University of Benin	60	102	7	5	12	0	186	21	9
University of Uyo	0	24	2	9	21	0	56	32	2
Total Citations	220	683	131	14	33	0	1081	189	6
No. of Publications	50	88	21	15	15	0			
Citation Frequency	4	8	6	1	2	0			

Table 3 shows the citation frequency of academic librarians of federal Universities in South-South Nigeria. Citation frequency is derived by dividing the number of citations by the number of publications. Academic librarians from the zone have a cumulative citation frequency of 6 with 1,081 citations coming from 189 publications in Google Scholar with University of Benin having the highest citation frequency of 9 with 186 citations from 21 publications. University of Calabar had 662 citations, 80 publications and a citation frequency of 8. Federal University Otuoke had a citation frequency of 4 with 39 citations from 11 publications while the University of Port Harcourt had a citation frequency of 3 with 138 citations from 45 publications. University of Uyo had the lowest citation frequency of 2 with 56 citations from 32 publications. The table further showed that Senior/Principal librarians had the highest citation frequency of 8 in Google Scholar with 683 citations from 88 publications. Librarian I have 131 citations, 21 publications and a citation frequency of 6. University Librarians/Professors have 220 citations from 50 publications and a citation frequency of 4 while Assistant Librarians have 33 citations from 15 publications, giving a citation frequency of 2. The lowest citation frequency of 1 in the database came from academic librarians in the rank of Librarian II who had 14 citations from 15 publications.

RQ 2: What is the H-index of Academic Librarians of federal Universities in South-South Nigeria?

Table 4: H-index of Academic Librarians of Federal Universities in South-South Nigeria using Google Scholar Database

Universities	Total Citations	Number of citations for first 15 publications															H-index
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
University of Calabar	662	178	95	88	85	67	36	25	22	22	17	13	12	12	11	1	12
University of Benin	186	54	38	36	17	12	7	7	5	5	2	1	1	1			7
University of Port Harcourt	138	29	25	20	16	12	9	6	4	3	3	3	2	2	2	2	6
University of Uyo	56	22	14	8	2	1	1	1	1	1	1	1	1	1	1		3
Federal University, Otuoke	39	30	4	3	2												3
Total	1081																17

Table 4 revealed the h-index of academic librarians in the zone as 17 with 1081 citations. The h-index for a group takes all the publications of every member of the group and creates a cumulative score which is calculated by sorting all the publications of members of the group and decreasing the number of citations until h of the publications have at least h citations each where $h=1, 2, 3, \dots, n$. University of Calabar had the highest h-index of 12 with a total of 662 visible citations. University of Benin had 186 citations and an h-index of 7 while University of Port Harcourt had an h-index of 6 with 138 citations. University of Uyo and Federal University, Otuoke both had an h-index of 3 with 56 and 39 citations respectively.

1.7 Discussion on findings

The findings as in the first research question revealed that the citation frequency of 6 from academic librarians in the zone is not very encouraging when compared to the number of publications linked to the academic librarians. This is an indication that academic librarians' research is not making significant impact in the scholarly community. It is interesting to observe that although University of Calabar had the highest number of citations, they do not have the highest citation frequency. The findings indicate that the academic librarians from the University of Benin are making more research impact in the field of librarianship, as they had the highest citation frequency. This goes a long way to show the import of citations and the influence it has on research visibility which is well documented in the literature. For instance Martínez et al. (2013) are of the opinion that the more often a paper become cited, the greater its influence on the field. Finding here is actually in alignment with that of Rotich and Musakali, (2013) who observed that low citation count and visibility in major databases is responsible for the poor significant citation impact of some senior scholars in most African Universities.

The findings of the second research question reveal that the h-index of academic librarians in federal Universities in South-South Nigeria is 17 during the period under study. This finding indicates a very low level of research impact because h-index is synonymous with citations as it utilizes citation analysis to determine an individual's impact. This measure aims to capture productivity as well as impact by counting how many of an author's papers have been cited many times and is used for the evaluation of research performance. This is a true reflection of the low ranking reported by (Ogbogu, 2013; Kpolovie, 2013) in their study of quality assurance and quality control in the Nigerian educational system and also in tandem with Kpolovie and Obilor (2013b; 2013a) conclusions that Nigerian Universities bag ludicrous ranks in world rankings of Universities. With the h-index of 17 as revealed in this work, the day that academic librarians of federal Universities in South-South Nigeria will have h-indexes as high as those of Sigmund Freud of the University of Vienna, Graham Colditz of Washington University in St. Louis and Eugene Braunwald of Harvard Medical School with h-indexes of 272, 271 and 250 and citations of 482648, 268650 and 308150 respectively as at January 2017 (Webometrics, 2017) can never even be imagined.

1.8 Conclusion

This paper has portrayed the true position of the citations and citation frequency of academic librarians of federal Universities in South-South Nigeria. The findings are hinged on best in class (BIC) acclaimed sources: h-index and Google Scholar citation database. The idea is to popularize the great need for the adoption of h-index as measures of research productivity in Nigeria as against the erstwhile commonly used self-reporting instrument (questionnaire), and citations count for investigations of scholarly productivity in Nigeria. The greater the number of citations made of works that are available on the Internet, the greater the probability of citing some that were done by academic librarians from the region. When more of such works are cited, the citation frequency and h-index of these librarians will likely improve.

The findings of the study also have theoretical implication because the results of the study established a link between on-line visibility, number of citations and h-index. This result has not deviated from the social presence theory which is all about the degree of interaction and visibility between oneself and others in a social, knowledge-sharing medium such as a network, which facilitates an awareness of other people and the development of professional relationships, communication and knowledge utilization. The implication is that the ability of the academic librarians to effectively make their research visible and accessible on-line will increase the chances of their research being noticed and used to create impact, thus increasing their own reputation and chances of success in their academic work and higher global rankings for their institutions. It is our recommendation that, academic librarians should be thorough and produce research outputs that are citable. What is more, academic librarians should be encouraged to deposit outputs of their research in institutional repositories. This will enhance their research visibility and increase the chances of it being used and cited by peers and the wider research community. What is even more, University authority/management should initiate programmes for regular training and sponsorship of their academic librarians to attend conferences and workshops on current trends in research methods and on-line publishing. From the foregoing, the paper does not in any way lay claim to have successfully exhausted all the issues involved in determining academic librarians' research output. To that extent we recommend that further studies should be carried out in this space, especially in comprehending search engine optimization and academic librarians in Nigeria.

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