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Research

Analysis of Scholarly Productivity of the Academic Staff of East African School of Library and Information Science (EASLIS), Makerere University

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Scholarly productivity measures the quantity of research outputs in peer reviewed journals and scholarly presentations in conferences or other similar gatherings of an individual or an institution. The study analyzed the scholarly productivity of the academic staff of East African School of Library and Information Science (EASLIS) for the last 15 years; 2004 to 2019. The objectives of the study were: to establish the scholarly productivity of EASLIS academic staff for the last 15 years (2004 to 2019), to understand the various bibliometric tools used in determining scholarly productivity, and to explore the bibliometric indicators in Publish or perish (PoP) software for the analysis of scholarly productivity. Mixed research method was adopted. Google scholar as a bibliometric tool and PoP software were used to retrieve the data of the 18 academic staff that were included in the study. The findings show that a total of 147 publications were made by 18 EASLIS academic staff from 2004 to 2019; with cumulative citations of 952; h-index of 44 and g-index of 81. Generally, PhD holders at EASLIS were found to have more impact in terms of scholarly productivity than their counterparts without PhDs, thereby making greater contributions towards the overall intellectual capital of the University. It is recommended that scholars publish their works in visible journals such that their scholarly works do not go unnoticed. Academic institutions are also encouraged to embrace the use of bibliometric tools such as Google scholar and PoP software to establish scholarly productivity and impact of their academic staff, and to use such statistics in guiding the recruitment and promotions of their academic staff.

Key wards: Scholarly productivity, Bibliometrics, Bibliometric tools, Bibliometric indicators, EASLIS academic staff.

INTRODUCTION

Scholarly productivity can be defined by the quantity of output in terms of peer reviewed publications, grant proposals, books, or any quantity of publications per calendar year of scholarly work. This can be measured using various bibliometric tools. Bibliometrics concerns the application of mathematical and statistical methods to book and other media of communication (Pritchard 1969). It looks at the contributions of authors, groups, organizations, and countries to the growth of literature in a subject, how this literature is scattered over various journals or documentary types and how fast this literature becomes obsolete. The scholarly productivity relating to the quantity of publications which is our focus is a critical indicator of performance in the academic arena. Research projects in most cases are expected to provide both effective and focused solutions to enormous challenges faced by various individuals; institutions; countries or regions (Wamala & Ssembatya, 2013). This implies that scholarly research projects are problem solving interventions to better situations in different parameters. For instance, Scholarly productivity of the academic staff of East African School of Library and Information Science (EASLIS) may play dynamic and critical roles including; meeting the learning, teaching and research information needs, as well as building the intellectual capital of the University.

Makerere University administration has tried to set a favorable environment geared at promoting scholarly output of the academic staff, students, and other inventors. Top on the list of the interventions made by the University includes the presence of a state-of-the-art library that gives access to a wide range of information resources in both print and electronic formats to support the teaching, learning and research objectives of the University. Makerere University Institutional Repository (MakIR) is another crucial element in supporting scholarly output. MakIR offers a digital collection of scholarly output of Makerere University researchers, including other scholarly articles and books. The University also introduced the intellectual property management policy, (2008), to assist researchers, research managers and the university to enhance protection and management of intellectual property and to maximize the benefits of public investments in research. The policy also focuses on minimizing the lost opportunities arising from failure to protect innovation and research outputs by inventors and the University community. These interventions are critical ingredients in influencing scholarly productivity.

However, despite these efforts, and the seemingly favorable conditions to foster research outputs, the contribution of the academic staff from EASLIS to the overall intellectual capital of the university has not been clear. The study, therefore, analyzed the scholarly productivity of EASLIS academic staff to establish their contributions towards the overall intellectual capital of the University.

STATEMENT OF THE PROBLEM

In the current information age, scholarly output has continually been crucial in informing research, learning, and enriching intellectual capital of academic institutions. The advent of Information and communication technologies (ICTs) and especially the bibliometric tools such as; Google scholar, Web of Science, Scopus, among others has made it easy to analyze scholarly productivity of authors and institutions as well as that of journals. In reference to Uni-Rank that majorly depend on research and innovations of academic Universities, Makerere University has continuously been ranked top in Uganda, (Uni-rank, 2020). Despite the good performance by the University, there are things that have remained unclear. For example, it has not been clear what contribution the EASLIS staff made for the last 15 years to the overall University intellectual capital, what bibliometric tools can be used to carry out such an analysis, and how would publish or perish (PoP) software be employed in a bibliometric analysis. The existence of such uncertainty had not attracted any scholarly publication, and this created a knowledge gap.

This study, therefore, aimed at filling the existing knowledge gap by analyzing the scholarly output of EASLIS academic staff for the last 15 years (2004-2019), so that their scholarly contributions do not go unnoticed.

PURPOSE OF THE STUDY

The purpose of the study was to analyze the scholarly productivity of EASLIS academic staff for the last 15 years (2004 – 2019) and to establish their contributions to the overall intellectual capital of the University.

OBJECTIVES

1. To establish the scholarly productivity of EASLIS academic staff for the last 15 years (2004 to 2019).
2. To understand the various bibliometric tools used in determining scholarly productivity.
3. To explore the bibliometric indicators in Publish or perish software for the analysis of scholarly productivity.

REVIEW OF RELATED LITERATURE

Scholarly productivity of the academic staff

Nakanjako, et al. (2017), conducted a study on the need to accelerate health research productivity in an African University: the case of Makerere University College of Health Sciences (MakCHS). PubMed and Google Scholar were used to quantify the publications from January 2000 to June 2015 and to analyze the collaborations, areas of research, among others. The study revealed that faculty research productivity was low and dominated by infectious diseases and non-communicable disease research. The study recommended actualization of structured institutional support to optimize faculty research output. It was not clear whether the low productivity in the MakCHS also applied to other colleges? Therefore, the researchers were inspired to conduct a study to establish the scholarly productivity of EASLIS academic staff.

Lwoga & Sife, (2013) conducted a Scientometrics analysis to map out the research productivity and scholarly impact of researchers at the Institute of Traditional Medicine (ITM) in Tanzania for the period between 1980 and 2013. Data were obtained using the Publish or Perish software that employed Google Scholar to retrieve scholars' productivity and impact. The findings show that a total of 381 publications were produced between 1980 and 2013, giving an average of 11.2 publications per year. The vast majority (91.9%) of the publications was multiple authored and the degree of collaboration was 0.92. The study calls for scholars to recognize the importance of publishing in visible journals to aid resource access and utilization. Institutions are also urged to embrace Scientometrics to evaluate scholarly productivity and impact. Therefore, it is evident that bibliometric tools are essential for evaluating scholarly productivity of scholars and institutions, as well as guiding on the most visible journals from which to publish.

Okon, Ngulube & Onyancha, (2014), conducted a study on the effect of accessibility and utilization of electronic information resources on productivity of academic staff in selected Nigerian universities. The findings show that increase in access and use of e-resources leads to increase in scholarly productivity of the academic staff in the surveyed universities. It was recommended that, given the relevance of e-resources on scholarly productivity, management of academic universities and librarians, National Universities Commission (NUC) and other stakeholders in Nigerian universities should enhance access and utilization of e-resources to boost scholarly productivity of the academic staff. This implies that access and use of e-resources a vital element in the scholarly productivity of the academic staff.

It is worth noting that Makerere University through Makerere University Library (Mak Lib) using its institutional Repository (MakIR) and other subscription journals, both print and electronic are made accessible to its staff and patrons, which should be a booster for scholarly productivity.

Bibliometric Analysis

Bibliometric analysis is frequently used to evaluate the scientific and scholarly publications (Waltman & Noyons, 2018; Maharana & Sethi, 2013). The use of bibliometric methods in the scientific and professional community goes beyond the original idea of simple listing of scientific production or citation indexing. In the academic world, ranking and other productivity measurements are applied routinely based on bibliometric indicators (Ellegaard, 2018). Bibliometric analysis can be performed on authors, journals and, or institutions, but the tools and methods can differ depending on which category is chosen. For instance, if one chose to measure the productivity of a scholarly work of an institution, h-index can be used. This is because h-index is a bibliometric indicator which measures the productivity and impact of a scholarly work and can also be used to rank the higher education institutions and their staff (La-Fatlawi, 2015).

Bibliometric tools

Meho & Yang, (2007) conducted a study on the impact of data sources on citation counts and rankings of Library & Information Science (LIS) Faculty on Web of Science versus Scopus and Google Scholar. The results showed that Scopus significantly alerts the relative ranking of scholars. However, Google Scholar stands out in its coverage of conference proceedings. It was reported that the use of Scopus and Google Scholar, in addition to Web of Science, helps to reveal a more accurate and comprehensive picture of the scholarly impact of authors. This implies that, to obtain a comprehensive picture of the scholarly impact of authors, bibliometric tools ought to be triangulated.

Waltman & Noyons, (2018), highlighted that Google Scholar is an online search engine for scientific and scholarly literature. Compared to Web of Science (WoS) and Scopus, Google Scholar has two advantages. One is that Google Scholar is freely available, and no subscription is required, and the other advantage is that Google Scholar offers a more comprehensive coverage of the scientific and scholarly literature. This study assumed that the scholarly works of EASLIS academic staff are accessible using Google Scholar. Therefore, the study adopted Google Scholar as a bibliometric tool and Publish or Perish software to access and retrieve data on the scholarly productivity of EASLIS academic staff.

Web of science (WoS)

This is a bibliometric tool used to analyze the impact of an institution, article, or author through analysis of scholarly productivity and citation analysis. Clarivate Analytics' WoS is the world's leading scientific search and analytical information platform. It is used as both a research tool supporting a broad array of scientific tasks across diverse knowledge domains, as well as a dataset for large-scale data intensive studies (Kai Li, Rollins & Yan, 2018).

Scopus

Scopus is a research tool from Elsevier publishing company. Scopus covers journals, conference proceedings and books in the science, social sciences, arts, and humanities. It should be noted that both WoS and Scopus require subscription. The subscribers must pay for the license to have access to the bibliometric data (Waltman & Noyons, 2018).

Journal Citation Reports (JCR)

The Journal Citation Reports (JCR) are used to analyze the impact of journals in supporting scholarly works. According to, (Web of Science Group, 2019), the JCR provides journal intelligence that highlights the value and contribution of journals through a rich array of transparent data, metrics, and analysis. The Journal citation reports are produced annually and rank journals in relation to their impact factors in specific subject areas and in specific countries or regions.

Publish or perish software

According to Harzing (2007), Publish or Perish (PoP) is a software program that retrieves and analyzes academic citations. It uses a variety of data sources such as google scholar; Microsoft academic; Scopus and Web of Science to obtain the raw citations, analyze and present them in the following metrices:

● Papers: Total number of papers published
● Citations: Average citations per year; and Citations per paper.
● Authorship per paper: The average number of authors per paper.
● H-index: The h-index is an index that attempts to measure both the productivity and citation impact of the published works of the scientists or scholars, as well as the institutions (La-Fatlawi, 2015).
● G-index: This reveals the number of citations received per paper of a given author ranked in a decreasing order.

Academic institutions may find PoP useful in determining the promotions of staff in a fair and equitable way basing on the publications and citation information. PoP can also be used to determine the relevant journals to publish scholarly works, for quick literature review, and to identify the most cited articles and/or scholars in a field. PoP is also well suited for analyzing bibliometrics on authors and journals (Harzing, 2010). This is the reason why this study chose to use PoP software to conduct the analysis on the academic productivity of the EASLIS academic staff.

METHODOLOGY

Mixed research method was adopted in this study. Mixed research method is the hybrid of quantitative and qualitative methods of research. The method involved collection of both quantitative and qualitative data on the scholarly productivity of EASLIS academic staff for the last 15 years (2004-2019). Google scholar as a bibliometric tool and PoP software were used to retrieve the data online. The names of each of the 18 academic staff were entered in PoP software to determine their individual scholarly productivity for the period under study. This enabled access, retrieval and analysis of scholarly productivity data in line with PoP indicators such as; publication count, citation count, citation per year, citation per paper, authorship par paper, h-Index, and g-Index, among others. The mixed data analysis method was used. This involved use of quantitative tables and figures which were summarized and designed using Microsoft excel. Qualitative description and interpretation of the findings were also incorporated to enhance understanding of the findings.

Steps taken in the bibliometric data extraction using Publish or Perish

● Download, install and open publish or perish software on an Internet connected laptop.
● Enter the author's name for whom search is to be conducted.
● Enter the period of interest.
● Click the search icon.
● The details of the author's publications will be displayed with key indicators as: the titles (papers); year of publication; citations; h-index, among others.
● These indicators are then summarized in an excel sheet for further analysis and interpretations.

The search and retrieval of statistical data is done for an individual author or person for whom the analysis is to be conducted. The steps are further illustrated in figure 1, below.

Figure 1. Illustration of steps of data extraction on Publish or Perish
Source: Data extraction using publish or perish, 2020.

FINDINGS

Table 1: Summary of Scholarly productivity of EASLIS Academic staff 2004 -2019.

SN	EASLIS ACADEMIC STAFF INCLUDED IN THE STUDY	No. of Publications	No. of Citation	Citation per year	Citation per paper	Authorship Per Paper	h-index	g-index	hI, Norm	hI, Annual
1	Okello-Obura Constant (Prof.)	32	480	36.92	15	2.06	13	21	9	0.69
2	Sarah Kaddu (Dr.)	22	61	4.07	2.77	1.82	4	7	4	0.27
3	Joyce Bukirwa (Dr.)	16	53	3.53	3.31	2.19	3	7	2	0.13
4	Omona Walter (Dr.)	11	147	10.5	13.36	2.09	4	11	4	0.29
5	Nalumaga Ruth (Dr.)	14	11	0.79	0.79	2.29	2	3	2	0.14
6	David Luyombya (Dr.)	9	52	6.56	6.56	1.56	4	7	3	0.33
7	Lugya Fredrick (Dr.)	10	23	2.56	2.3	1.6	2	4	2	0.22
8	Kawalya Jane (Dr.)	8	22	1.83	2.75	1.13	3	4	3	0.25
9	Ssekitto Francis (Mr.)	5	23	2.88	4.6	1.4	2	4	2	0.25
10	Mutibwa Lois (Ms.)	4	16	4	4	3.5	1	4	1	0.25
11	George William Kiyingi (Dr.)	3	44	3.38	14.67	2.67	1	3	1	0.08
12	Faridah Muzaki (Ms.)	3	4	1	1.33	1.33	2	2	1	0.25
13	Richard Batte (Mr.)	2	13	0.87	6.5	2	1	2	1	0.07
14	Agabirwe Patience (Ms.)	2	1	0.13	0.5	2.5	1	1	0	0
15	Sylvia Namujuzi (Ms.)	3	0	0	0	1	0	0	0	0
16	Kulisooma Ezerea (Ms.)	1	1	0.13	1	4	1	1	0	0
17	Kidaaga Jushua Justine (Mr.)	1	1	0	0	0	0	0	0	0
18	Ekwaro Francis (Mr.)	1	0	0	0	1	0	0	0	0
	TOTAL	**147**	**952**	**79.15**	**79.44**	**34.14**	**44**	**81**	**35**	**3.22**

Source: Research data, 2020.

Table 1 above is the summary of the findings on the scholarly productivity of EASLIS academic staff for the period of 15 years (2004-2019). The summary is based on key indicators analyzed under Publish or Perish such as: number of scholarly publications made, number of citations, citations per year, citations per paper, authorship per paper, h-index, g-index, hi-norm, and hi-annual. In relation to publications, the table shows a big margin between the top-ranking academic staff contributing 21.8 % of the total publications with the lowest ranking at only contributing 0.7%. The table also shows that academic staff who are PhD holders had more publications, citations, and generally more scholarly productivity than their counterparts who are not PhD holders in the period under study.

DATA ANALYSIS
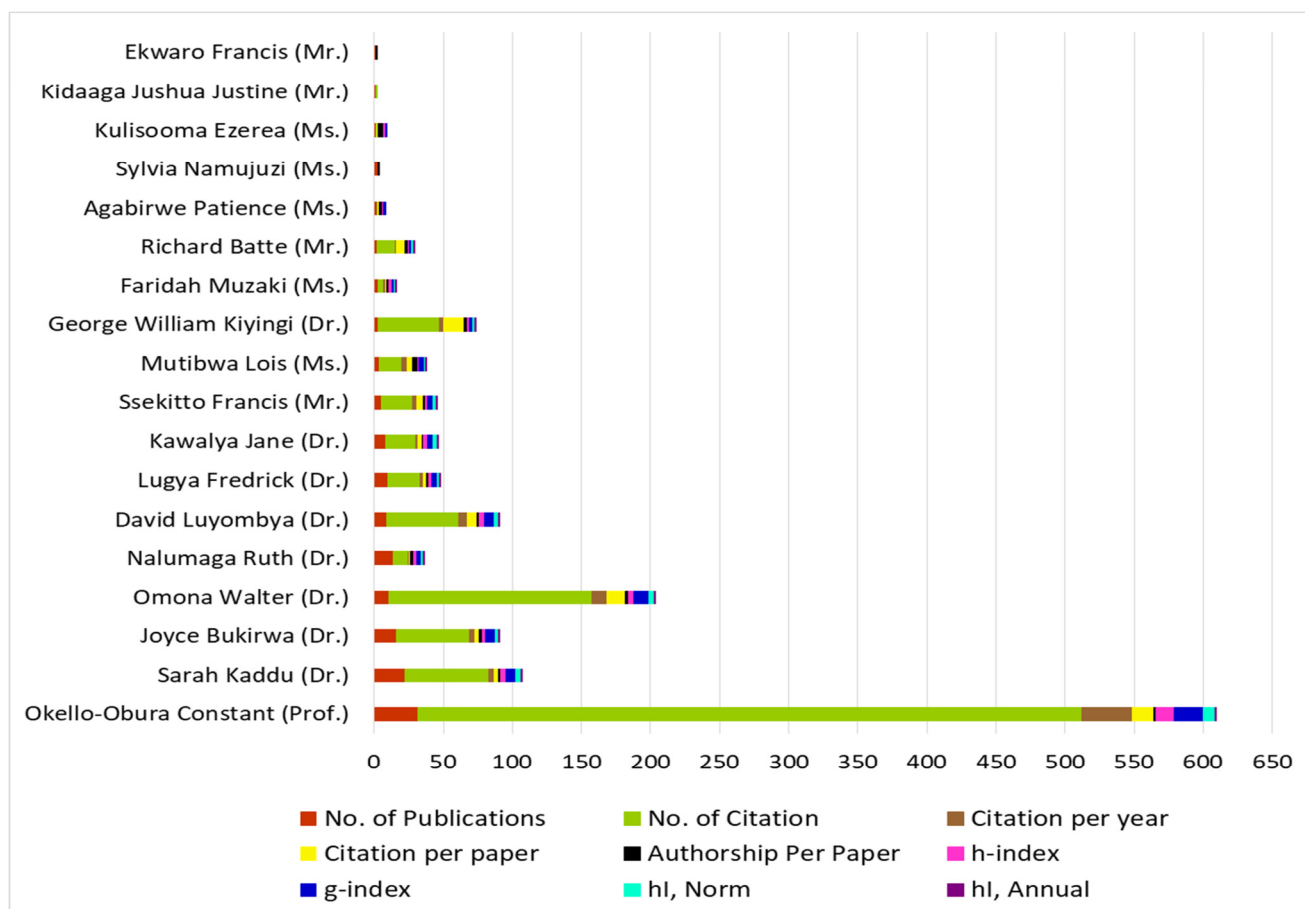
Figure 2: Scholarly productivity of PhD holders versus Non-PhD holders.
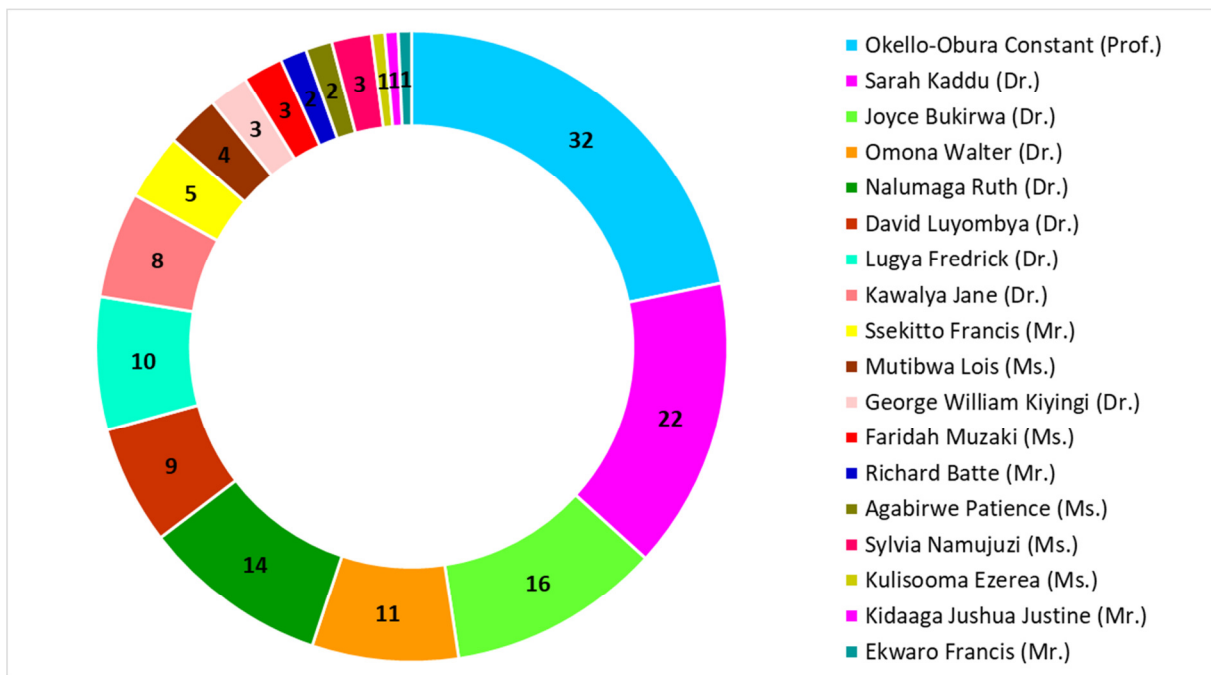**Source**: Research data, 2020.

It is evident from figure 2 above that academic staff of EASLIS that have PhDs have more scholarly output than those without PhDs in the period under study. For instance, Okello-Obura Constant (Prof.) published 32 scholarly works within the period of study, the analysis reveals he has a higher h-index, g-index and citations made to his works in the 15 year period (2004 to 2019). His works have so far attracted 480 (50.4%) citations compared to 472 (49.6%) citations made to the rest of EASLIS staff. The cumulative productivity of staff with PhDs which show a better performance could be attributed to the academic requirements of the qualifications.

Analysis of the findings in accordance with PoP indicators

The detailed explanation of the summary of the findings of the productivity of EASLIS staff according to the PoP metrics entails; publication count, citation counts, authorship per paper, h-index, and g-index as expounded below.

Publication Count

This assesses the scholarly output in terms of number of publications an author has published.
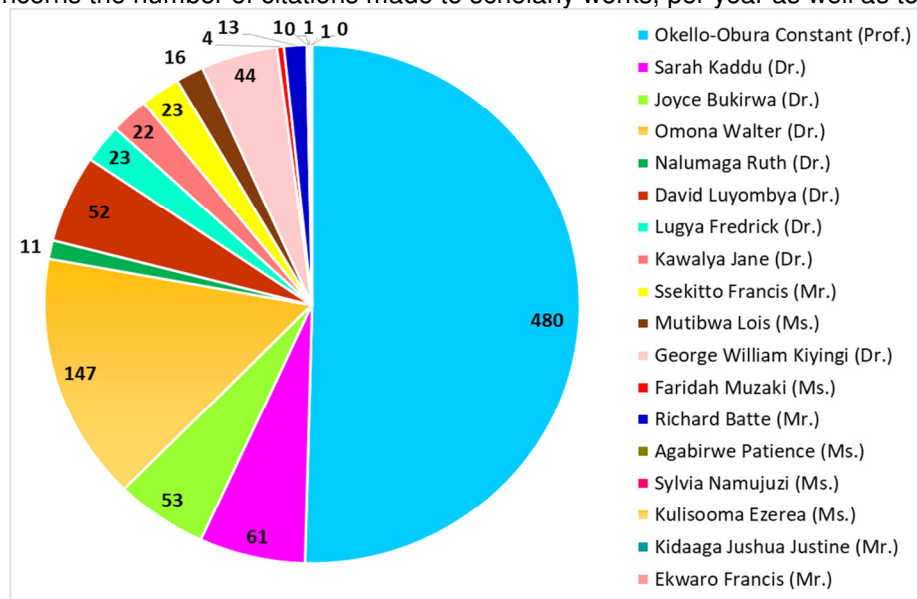

Figure 3: Publications by EASLIS Academic Staff 2004 to 2019
Source: Research data, 2020.

Figure 3 above, shows that Okello-Obura (Prof.); Sarah Kaddu (Dr.); and Joyce Bukirwa have the highest number publications; 32, 22, & 16 respectively among EASLIS academic staff in the last 15 years (2004-2019). Figure 3 also reflects a big margin of (31) publications between the highest ranking and the lowest EASLIS academic staff. This big divide in the publication leaves a lot of unanswered questions on the likely causes, much as we believe the gap can be partly attributed to the fact that the nature of PhD training warrants PhD holders to have more publications than their counterparts without PhD. Other reasons for this wide gap can be best explained by a further study to ascertain factors that impede and or motivate scholarly publication of the academic staff.

Citation Count

This concerns the number of citations made to scholarly works, per year as well as total citations.

Figure 4: Citations to scholarly works of EASLIS academic Staff 2004 to 2019
Source: Research Data, 2020.

From the figure 4 above, it is evident that by the time of this study, publications of Okello-Obura (Prof.) had attracted 480 citations to his 32 publications which is the highest citations among EASLIS academic staff. It is also evident that Okello-Obura Constant (Prof.) had 50.4% of the total citations attracted by all the scholarly publications of EASLIS academic staff. This therefore means that the impact factor of Prof. Okello-Obura's scholarly publications more than doubled the rest of the academic staff combined. And this could have informed his recent promotion from associate professor to a full professor. It is also worth mentioning that Omona Walter (Dr) published 11 papers, which makes him fourth ranking in terms of the number of publications made in the period of study. However, the 11 publications attracted a total of 147 citations, making the works by Omona Walter (Dr) second ranking in terms of citations, with an average of 10.5 citations per year and 13.36 citations per paper. Generally, many of the publications made by EASLIS staff within the period of this study attracted a good number of citations as evident in figure 4, implying significant impact made by their scholarly works.

It is imperative for academic institutions to embrace the use of bibliometric tools such as google scholar and publish or perish software to establish scholarly productivity and impact of their staff to guide in taking decisions like in recruitment and promotions.

Authorship per paper

This concerns the average number of authors per paper, analyzed to determine the level of collaboration in scholarly works. For example, the results from publish or perish as summarized in table 1 above show that most EASLIS academic staff publish their papers in collaboration with other scholars. This could also have a positive impact on the quality of their scholarly works. The study shows that the average authorship per paper is two (2).

H-Index

The h-index is based on the scientist's most cited papers and the number of citations that they have received in other publications (Masic, 2016). For example, table 1, above shows that the overall h-index is 44; out of which, Okello-Obura Constant (Prof.) has the highest h-index of 13 representing 29.5% of the total h-index. This means that 13 papers out of 32 are the most cited. Other scholars like Sarah Kaddu (Dr.); Walter Omona (Dr.) and David Luyombya (Dr.) each scored an h-index of 4, representing 9% of the overall h-index. The h-index measure can be valuable in indicating the impact factor of the work, but also inform other scholars of areas receiving most attention and/ or areas requiring further study.

G- Index

The g-index aims to improve and complement the h-index in assessing outputs of the scientists by giving more weight to highly cited articles. For instance, from Table 1, the overall g-index attracted by EASLIS scholarly output

is 81, yet h-index is 44, indicating that g-index gives more weight to highly cited scholarly works. It can be seen from this that the h-index and g-index should be used complementarily to give a proper view of scholarly productivity.

CONCLUSIONS

Bibliometric tools such as google scholar, web of science, Scopus and Journal citation reports are essential tools in the analysis of scholarly productivity of authors, institutions as well as journals. Therefore, it is important for analysts to consider triangulation of tools and methods used in bibliometric analysis to improve reliability.

The overall productivity of academic staff at EASLIS shows that on average, each staff made one (1) publication after every two years. Given that the total number of publications were 147 in the 15-year period studied as seen in Table 1, it means on average, each staff contributed 0.54 publications to the overall intellectual capital of the university.

The statistics show that one can have fewer publications but have more impact as is the case with Omona Walter (Dr). It is also noted that scholarly productivity of EASLIS academic staff with PhDs is higher than their counterparts without PhDs in the period of study. This means that PhD holders at EASLIS have made a greater contribution towards the overall intellectual capital of the university.

RECOMMENDATIONS

For cases where the staff could have made more publications than indicated by the analysis, we recommended that they publish their work in visible journals so that their scholarly works do not go unnoticed. Academic institutions are also encouraged to embrace the use of bibliometric tools like google scholar and publish or perish software that are free, to establish scholarly productivity and impact of their staff to guide in decision making such as recruitment, realignment or allocation of duties, and promotion.

We recommend that a detailed analysis of the nature of publications from academic staff be looked at in the future study as our focus was limited to the numerical analysis of their output. Another study to ascertain factors that impede and/ or that motivate scholarly publication of the academic staff in a university like Makerere would yield useful insights that can inform the university management on the existing challenges and possible mitigation strategies.

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