April 2021

AWARENESS, KNOWLEDGE AND USE OF ALTMETRICS AS MEASURE OF RESEARCH IMPACT: NIGERIAN LIBRARIANS' PERSPECTIVES

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ABSTRACT

Over time, there has been the alternative metrics complementing the traditional citation counts in scientometrics. The awareness, knowledge and use of these altmetrics tools in measuring research impact are unknown among Nigerian librarians. Hence, this study examined the awareness, knowledge and use of altmetrics as measure of research impact by Nigerian librarians. Descriptive survey research design was adopted for the study and total population sampling technique was adopted. Web-based questionnaire was used to collect data for the study. Two hundred and eighty-five responses were collected from the participants. The findings of the study show that most Nigerian librarians were not aware of altmetrics as non-traditional complement to traditional citation count. Results show that Nigerian librarians did not use altmetrics for measuring their research impact. It was shown that there was inadequate knowledge of altmetrics and it was unpopular among Nigerian librarians in measuring research impact. It was found that there was no statistically positive significant ($r = .482^{**}$; $P < .022$) relationship between awareness and use of altmetrics to measure research impact by Nigerian librarians. Results show that there was no statistically positive significant ($r = .374^{**}$; $P < .039$) relationship between librarians' knowledge and use of altmetrics to measure research impact. It was concluded that that most Nigerian librarians use Twitter to seek altmetrics compared to other social media networks such as Facebook and LinkedIn which have very minimal usage.

Keywords: **Altmetrics; Research Impact; Awareness of Altmetrics; Knowledge of Altmetrics; Use of Altmetrics**

INTRODUCTION

There has been continuous development in scientometrics on frameworks that determines research impact. Scientometrics is increasingly becoming important in scientific communication. There has been different metrics adopted by many researchers or scientists in determining how their research is performing among other series of literature. Research metrics allow researchers to easily track the performance of their research reports and how well they have been engaged by readers. The various metrics in research can be on three levels; which could be journal, article or author. Above all, research metrics provide researchers and journals an objective and data-driven assessment of their performances. It was noted that different methods have been adopted by researchers to determine research impact but they all come with their different challenges (Togia, Koseoglu, & Zapounidou, 2017).

The emergence of altmetrics in measuring research impact is aimed at improving the analysis of the impact of scholarly communication (Galligan & Dyas-Correia, 2013). Altmetrics covers a broad range of research items and does not only measure article-level metrics but its impact in a broader sense by looking more than citations, and provides insight into research impact on various audiences which is an indicator of societal impact of research, and above all provide a better understanding of how a scholarly work has been used (Piwowar, 2013). Bornmann and Haunschild (2018) reported that "Almetrics" was first proposed by Jason Priem on Twitter in 2010. They stated that Priem and co-authors went ahead to publish Altmetrics Manifesto which detailed all the necessary information required to understand the new idea. Furthermore, it was advised that studies should be carried out to determine whether Altmetrics measure research impact or not.

It was established that most scholars in the fields of humanities and social sciences have adopted the use of social media in sharing their research results (Rowlands, *et al*., 2011). This suggests that there is high engagement of scholarly communication on social media and it will be unconscionable to treat the development with contempt in an era where research performance is increasingly attracting enormous attention. Meanwhile, it is observed there are some journals which communicate their publications using various social media. These journals adopt this strategy to help increase the engagement of their articles. Additionally, scholars and individuals alike share and engage research articles on various social media. Zador, Barnett, Suzor and Cahill (2018) concluded that the engagement of research articles determines its usage. This

indicates that the engagement of research articles suggest creditable usage. In simpler terms, Almetrics may help increase the engagement of research articles.

It is in the capacity of librarians to design programs and techniques that will help in ensuring that researchers and decision makers are well-informed and supported in the use of Almetrics (Lapinski, Piwowar & Priem, 2013). This means that librarians are in the pole position to ensure the effective usage of Altmetrics. It is imperative that librarians are involved in the strategies on how best practices in alternative metrics could be entrenched (National Information Standards Organization, 2014). Being adorned with this responsibility presupposes that librarians are aware, knowledgeable and make use of altmetrics as determinant of research performance. The idea that librarians' involvement with scientometrics and bibliometrics did not start with Altmetrics. Impact factor was basically created for use by librarians in making decisions that surround collection development (Roemar & Borchardt, 2015). Hence, it is essential that librarians are familiar with providing adequate support to use bibliometrics tools.

Historically, the definition of research impact has been difficult to capture (Ferrier-Watson, 2019). However, there are some definitions as proposed by different scholars. Roemer and Borchardt (2015) noted that research impact is the trackable influence a scholarly communication has on other research phenomenon in the discipline. Contextually, research impact is the extent of measureable influence a research article/element has in the body of literature. Nigerian librarians have shown to pay enormous attention to the performance of research articles with the use of traditional citation metrics, such as h-index. This is evident in the annual Dr T. M. Salisu's Award, which recognizes the most published librarian in Nigeria. This award is given by the Nigerian Library Association (NLA) and it recognizes the most cited among Nigerian librarians. This shows the importance of being informed of the research impacts of the research articles of Nigerian librarians.

Ultimately, librarians become beacon and guidance to the academic community with respect to the use of altmetrics tools. They provide awareness of the necessary metrics tools with their experience and expertise. Mamtora and Haddow (2015) show that more than half of libraries in Australian provide guidance on the use of altmetric tools as research metrics impact. This suggests that librarians support researchers on the use of altmetrics tools. Furthermore, Lewis, Sarli, and Suiter (2015) show that librarians provide research impact assessment services to their patrons. In this wise, this suggests that librarians should be aware, knowledgeable and be

able to use altmetrics tools in order to cater for researchers and all categories of users alike. It is based on the foregoing that this study sought to examine the awareness, knowledge and use of altmetrics as measure of research impact by Nigerian librarians.

STATEMENT OF THE PROBLEM

Almetrics complements traditional citation such as h-index, which measure the research impact of research published by various scholars. Practically, librarians support researchers by providing consultation services and documentation with respect to research metrics. Librarians' support provides the needed support for researchers to compile their research metrics. It is premise on this that examining librarians' awareness, knowledge and use of altmetrics becomes pertinent. This will help boost the capability of researchers in relation to compilation of their researcher metrics. This suggests the attention the research items are getting in the unconventional realm of social media. The involvement of librarians in this scientific communication process prepares them to become specialist as it involves giving evidence of possible quality and usefulness of academic realms which traditional metrics did not cater for (ACRL, 2014).

According to Miles, Konkiel and Sutton (2018), there is no information on librarians' knowledge of almetric as a measure of research impact world over. However, there are few national-scale studies that provide answers to questions on the awareness, knowledge and usage of altmetrics in different countries. There was a study carried out in Spain (González-Fernández-Villavicencio, Domínguez-Aroca, Calderón-Rehecho, & García-Hernández, 2015) on awareness of academic librarians about altmetrics and in Sweden (Nordfeldt, 2015) on the awareness of LIS scholars and PhD students. All of these studies were carried out in European countries and developed climes compared to Nigeria. The findings of the studies may not represent what is obtainable in a developing country such as Nigeria and above all Africa. This left unanswered questions as to the awareness, knowledge and use of altmetrics by Nigerian librarians. It is on this premise that this study seeks to examine awareness, knowledge and use of altmetrics as measure of research impact by Nigerian librarians.

OBJECTIVES

The main objective of this study is to examine the awareness, knowledge and use of altmetrics to measure research impact by Nigerian librarians. The specific objectives are to:

1. assess Nigerian librarians' awareness of altmetrics as research impact;
2. relate the perceived knowledge of Nigerian librarians about altmetrics as measure of research impact;
3. investigate factors that influence the use of altmetrics to measure research impact;
4. examine the reasons for using altmetrics to measure research impact; and
5. examine where Nigerian librarians seek altmetrics for their scholarly works.

RESEARCH QUESTION

The findings of this study sought to answer the following questions:
1. What is Nigerian librarians' awareness about altmetrics to measure research impact?
2. What is Nigerian librarians' perceived knowledge of altmetrics to measure research impact?
3. What are the factors that influence the use of altmetrics to measure research impact?
4. Why do Nigerian librarians use altmetrics to measure research impact?
5. Where do Nigerian librarians seek altmetrics for their scholarly works?

HYPOTHESES

H_{01}: There is no statistically significant relationship between awareness and use of altmetrics to measure research impact

H_{02}: There is no statistically significant relationship between librarians' knowledge and use of altmetrics to measure research impact

REVIEW OF RELATED LITERATURE

Basically, altmetrics track the engagement of research articles on various social media, the press and other non-traditional means (Sutton, Miles, & Konkiel, 2018). Thelma (2020) stressed that altmetrics have been recommended as a temporary solution to two research management problems, which include assessing the societal impacts of research and obtaining early impact evidence. Unlike the traditional citation, which gives attention to engagement of research only in academic or research literature, altmetrics seek to expand the horizon of research articles engagements on other media. In the 21st Century, librarians perform the hybrid role of knowledge gateway and curator. They are at the forefront as advocates on the benefits of altmetrics. Robinson-Garcia, Costa, Isett, Melkers and Hicks (2017) noted that librarians are important ally in the promotion of altmetrics. This further reemphasize why librarians are cogs in

the wheel of entrenching the use of altmetrics. Meanwhile, this cannot be possible without proper awareness and adequate knowledge on its usage.

Similar to formal metrics, altmetrics are applicable in four facets, which includes author (e.g. article, blog, chapter, dataset); venue (e.g. journal, publisher, conference); author output over time; and institutional output over time (Roemer & Borchardt, 2015). Wouters and Costas (2012) enumerated the advantages of using altmetrics over traditional metrics to include the diversity of sources and the traceability of web-based performance, prompt measurement of performance, and the transparency in what is measured and how. With these benefits, scientific communication and performance of research articles can easily be measured in a fair manner. There are cases whereby some works cited by other researchers are not acknowledged in some indexing or abstracting service proprietary. For example, Scopus measures the performance of research articles using SciVal and articles on Web of Science are not added to the metrics. Similarly, citations of articles or research items will be difficult for Google to crawl if it is not indexed on Google Scholar.

Librarians are poised to reap from the ensuing benefits that come from the use of altmetrics since it provides a mechanism for quantitative evaluation of scholarly activities with a few methods for evaluative measures, such as tracking of Twitter comments and conversations during a presentation or a blog posting of scholarly communication (Roemer & Borchardt, 2015). Miles, Konkiel and Sutton (2018) investigated the scholarly communication relationship with research impact factors among academic librarians in the United States. The findings of the study show that academic librarians are most familiar with citation counts and usage statistics and least familiar with altmetrics. However, results hint at a rising interest in altmetrics among academic librarians for their professional advancement. This implies that although the usage of altmetrics were not significant as at the time of the study, there is great potential as to its usage to measure research impact in foreseeable future.

Thuna and King (2017) carried out a qualitative study on research metrics from the perspectives of faculty members of the University of Toronto, Ontario, Canada. Data was collected using semi-structured interview. It was found that most of the faculty members were not aware of altmetrics and the very few that were aware did not make use of it. The study findings show that there is an obvious gap between librarians and faculty researchers with respect to discipline-specific best practices as it concerns research metric use and other product

information. This gap might have been necessitated by the inadequate awareness and usage of altmetrics in the University of Toronto. Vinyard and Colvin (2018) investigated librarians using scholarly to select journals and it was found that many librarians were interested in assessing journal quality with the use of research metrics. The findings of the study further show that many librarians provide support to faculty members with respect to journal selection and evaluation of the impact of their research items. Moreover, results show that most of the faculty members were aware of journal metrics and are reliant on libraries/librarians for publishing advice.

Sutton, Miles and Konkiel (2018) assessed the awareness of altmetrics among LIS scholars and faculty in the United States and Canadian graduate LIS programs accredited by the American Library Association. Results show that while most of LIS faculty had some awareness of altmetrics, they reported greater familiarity with traditional measures of research impact such as citation counts and usage statistics. The findings also confirmed that there was a relationship between years of teaching experience and awareness of altmetrics, as well as among familiarity with altmetrics, familiarity with citation counts, and familiarity with usage statistics. DeSanto and Nichols (2017) surveyed faculty knowledge, use, and opinion about scholarly metrics using the University of Vermont, United States. The results show that most of the faculty members were not familiar with altmetrics. This indicates that there may possible be low level of awareness among the faculty awareness of a phenomenon presupposes the familiarity.

Aung, Erdt and Theng (2017) examined the awareness and usage of Altmetrics using an online survey. Results of the study show that article views and downloads from online digital libraries or repositories are very well-known. The findings revealed that the most used almetrics are mentions and shares on social networks. The most popular mention however was found to be those in blog posts and topics in a forum. The study findings revealed that there is possibility for non-faculty staff members to be more aware of altmetrics. Moreover, the results show that there is positive relationship between the usage of social media and altmetrics. Haddow and Hammarfelt (2019) examined the quality, impact and quantification as indicators as metrics used by social scientists in Australia and Sweden, using 581 scholars as sample. The findings show that a bit less than half of the respondents indicated they had used metrics. The study also show that half of the researchers used metrics for research evaluation or promotion of their work and in CVs and grant applications.

Ferrier-Watson (2019) investigated faculty perceptions and use of traditional and altmetrics at a medium-sized university in New Zealand. The results show that faculty in Sciences reported the greatest awareness and use of altmetrics. This is closely followed by faculty in Social Sciences. Findings revealed that faculty members in Arts and Humanities expressed the least awareness and use of altmetrics. The findings of the study also show that faculty suggests that traditional metrics should play lesser role in research evaluation and academic promotion compared to altmetrics. Furthermore, the study findings show that many of the faculty members were aware of the dissonance between what they see as the impact of their work and what actually is measured and valued by the multiple institutions of academia. It was however shown that the time and skill required to maintain profiles presents a challenge.

Malone and Burke (2016) found that academic librarians in Oklahoma have a dearth of knowledge about altmetrics tools. González-Fernández-Villavicencio *et al*. (2015) examined the role of librarians on the awareness of academic librarians on altmetrics and it was found that awareness of altmetrics among Spanish academic librarians hovers around 50%. This suggests that half of academic librarians in Spain are aware of altmetrics. However, same cannot be said of Nigerian librarians considering that Spain is a more developed country than Nigeria, which could be an intervening factor in their level of awareness. Nordfeldt (2015) survey altmetrics and scholarly communication among Swedish University libraries and found that Library and Information Science scholars and doctoral students use altmetrics as complement to traditional citation-based metrics. This shows that altmetrics are not seen as a major citation metrics by library and information science professionals.

METHODOLOGY

This study is basically concerned with describing the awareness, knowledge and use of altmetrics to measure research impact by Nigerian librarians. Therefore, descriptive survey was adopted as the research design. Hence, it is a quantitative research which involves collecting and analyzing numerical data. The Google Forms web-based questionnaire was used in collection of data. Total sampling technique was adopted for this study. The generated link for the web-based questionnaire was shared to various groups of Nigerian librarians on Twitter, such as Nigeria Library Association IT Section and Nigerian Library Association (Cataloging and Classification). Moreover, the link was shared privately to other librarians that were not on the aforesaid WhatsApp groups. Consents of the participants were sought before participation in the

study. Preliminary messages were sent to the various WhatsApp groups before sending the link to the survey. In order to ensure that the response rate is high, constant reminder was issued to participants and a period of ten (10) weeks was given to ensure participants respond to the survey. By and large, a total of 285 responses were gotten and that serves as the sample size of this study. In order to ensure the reliability of the questionnaire, Cronbach Alpha was tested for using Microsoft Excel and that results to 0.823 coefficient. All 285 responses were automatically analyzed on Google Forms using descriptive statistics of frequency counts and simple percentage. However, the hypotheses were tested using Pearson's product moment correlation (PPMC) on Microsoft Excel.

DATA ANALYSIS AND INTERPRETATION

This segment presents the analysis of data collected and interpretation. Two hundred and eighty-five (285) responses were collected from the participants, which represents the unit of analysis. The data were analyzed automatically on Google Forms while the hypotheses were tested using Microsoft Excel. The analysed data were presented with the use of tables.

Table 1: Demographic Characteristics of Respondents

Items	Frequency	Percentage
Gender		
Male	180	63.2%
Female	105	36.8%
Total	**285**	**100%**
Types of Library		
Academic library	229	80.3%
Special library	9	3.2%
Public library	25	8.8%
School library	10	3.5%
National library	0	0.0%
Private library	6	2.1%
Others	6	2.1%
Total	**285**	**100%**
Years of Experience		
1-10 years	168	58.9%
11-20 years	68	23.9%
21-30 years and above	31	10.9%
31 years and above	18	6.3%
Total	**285**	**100%**

Source: **Author's Fieldwork (2020)**

Table 1 shows that there were 180(63.2%) male that participated in the survey while there were 105(36.8%) female. This indicates that there were more male librarians than female librarians that participated in this study. It can be seen in Table 1 that most of the respondents (80.3%) were working in academic library and none of them was working in national library. Furthermore, both private library and other types of library had equal representation in the study with (2.1%) of the respondents. Moreover, it was shown in Table 1 that more than half of the respondents (58.9%) had between 1-10 years of experience and the least representation is from those with 31 years and more experience with (6.3%). This indicates that significant percentage of the respondents have do not have more than a decade of experience practicing as a librarian.

Table 2: Nigerian librarians' awareness of altmetrics to measure research impact

Items	Responses									
	Strongly Agreed		Agreed		Neutral		Disagreed		Strongly Disagreed	
	N	%	N	%	N	%	N	%	N	%
Altmetrics tools are non-tradition research metrics tools	46	16.1	73	25.6	17	6.0	82	28.8	67	23.5
Altmetrics track citations of research entity on social media and press	47	16.5	55	19.3	12	4.2	90	31.6	81	28.4
Altmetrics reflect value of research works than traditional citation count	40	14.0	32	11.2	18	6.3	90	31.6	105	36.9
Altmetrics crawl data from various non-journal articles media	52	18.2	60	21.1	10	3.5	78	27.4	85	29.8
Altmetrics are complement of traditional citation count	79	27.7	81	28.4	22	7.7	61	21.4	42	14.7

Source: **Author's Fieldwork (2020) (N.B.: SA+A=Agreed, SD+D=Disagreed)**

Table 2 shows that 119(41.9%) of the respondents agreed that altmetrics tools are non-traditional research metrics tools, 17(6.0%) were neutral and 149(52.3%) disagreed. This indicates that more than half of the respondents did not view altmetrics tools as non-traditional research metrics tools. It can be seen in Table 2 that 102(35.8%) agreed that altmetrics track citations of research entity on social media and press, 12(4.2%) were neutral and 171(60.0%) disagreed. This implies that most of the respondents did not agree that altmetrics track citations

of research entity on social media and press. It is shown in Table 2 that 72(25.2%) of the respondents agreed that altmetrics reflect value of research works than traditional citation counts, 18(6.3%) were neutral and 195(68.5%) disagreed. This suggests that most of the respondents disagreed that altmetrics reflect value of research works than traditional citation count.

It can be seen in Table 2 that 112(39.3%) agreed that altmetrics crawl data from various non-journal articles media, 10(3.5%) were neutral and 163(57.2%) disagreed. This indicates that more than half of the respondents disagreed that altmetrics crawl data from various non-journal articles media. Table 2 shows that 160(46.1%) agreed that altmetrics are complement of traditional citation count, 22(7.7%) were neutral and 103(36.1%) disagreed. This implies that most of the respondents agreed that altmetrics are complement of traditional citation count.

Table 3: Nigerian librarians' knowledge of altmetrics to measure research impact

Items	Responses									
	Strongly Agreed		Agreed		Neutral		Disagreed		Strongly Disagreed	
	N	%	N	%	N	%	N	%	N	%
I have knowledge of how altmetrics count citation	38	13.3	25	8.8	30	10.5	92	32.3	100	35.1
I have knowledge on the usage of altmetrics	41	14.4	29	10.2	19	6.7	115	40.3	81	28.4
I am familiar with the use of altmetrics to measure research impact	23	8.1	32	11.2	30	10.5	107	37.6	93	32.6
I have knowledge on using altmetrics to measure research impact	15	5.3	24	8.4	34	11.9	103	36.1	109	38.3
Altmetrics tools are popular among Nigerian librarians as research metric tool	39	13.7	28	9.8	24	8.4	102	35.8	92	32.3

Source: **Author's Fieldwork (2020) (N.B.: SA+A=Agreed, SD+D=Disagreed)**

Table 3 shows that 63(22.1%) of the respondents agreed that they have knowledge of how altmetrics count citation, 30(10.5%) were neutral and 192(67.4%) disagreed. This indicates that most of the respondents disagreed that they have knowledge of how altmetrics count citation. It can also be seen in Table 3 that 70(24.6%) agreed that they have knowledge on the

usage of altmetrics, 19(6.7%) were neutral and 196(68.7%) disagreed. This implies that significant number of the respondents disagreed that they have knowledge on the usage of altmetrics. Moreover, Table 3 illustrates that 55(19.3%) of the respondents agreed that they are familiar with the use of altmetrics in measuring research impact, 30(10.5%) and 200(70.2%) disagreed. This means that a large chunk of the respondents disagreed that they are familiar with the use of altmetrics in measuring research impact.

Table 3 shows that 39(13.7%) of the respondents agreed that they have knowledge on using altmetrics to measure research impact, 34(11.9%) were neutral and 212(74.4%) disagreed. This indicates that large part of the respondents disagreed that they have knowledge on using altmetrics to measure research impact. It can also be seen in Table 3 that 67(23.5%) agreed that altmetrics tools are popular among Nigerian librarians as research metric tool, 24(8.4%) were neutral and 194(68.1%) disagreed. This suggests that most of the respondents disagreed that altmetrics tools are popular among Nigerian librarians as research metrics tool.

Table 4: Factors influencing the use altmetrics in measuring research impact

Items	Strongly Agreed		Agreed		Neutral		Disagreed		Strongly Disagreed	
	N	%	N	%	N	%	N	%	N	%
Altmetrics are used for academic promotion	45	15.8	62	21.7	11	3.9	78	27.4	89	31.2
Altmetrics are used for research grants applications	55	19.3	51	17.9	14	4.9	83	29.1	82	28.8
Altmetrics tools are used for awards/recognition	73	25.6	60	21.1	15	5.3	62	21.7	75	26.3
Altmetrics are used for research assessment	35	12.2	49	17.2	21	7.4	98	34.4	82	28.8
Altmetrics are used to determine quality of journal	73	25.6	86	30.2	16	5.6	52	18.2	58	20.4

Source: **Author's Fieldwork (2020) (N.B.: SA+A=Agreed, SD+D=Disagreed)**

Table 4 shows that 107(36.5%) of the respondents agreed that altmetrics are used for academic promotion, 11(3.9%) were neutral and 167(58.6%) disagreed. This shows that more than half of the respondents disagreed that altmetrics are used for academic promotion. It can be

seen in Table 4 that 106(38.2%) agreed that altmetrics are used for research grants applications, 14(4.9%) were neutral and 165(57.9%) disagreed. This shows that most of the respondents disagreed that altmetrics are used for research grants applications. It is shown in Table 4 that 133(46.7%) of the respondents agreed that altmetrics tools are used for award/recognition, 15(5.3%) were neutral and 137(48.0%) disagreed. This shows that less than half of the respondents agreed and likewise disagreed that altmetrics tools are used for award/recognition.

It can be seen in Table 4 that 84(29.4%) agreed that altmetrics are used for research assessment, 21(7.4%) were neutral and 180(63.2%) disagreed. This implies that most of the respondents disagreed that altmetrics are used for research assessment. Moreover, Table 4 shows that 159(55.8%) agreed that altmetrics are used to determine quality of journal, 15(5.6%) were neutral and 110(38.6%) disagreed. This indicates that more than half of the respondents agreed that altmetrics are used to determine quality of journal.

Table 5: Reasons for using altmetrics to measure research impact

Items	Strongly Agreed		Agreed		Neutral		Disagreed		Strongly Disagreed	
	N	%	N	%	N	%	N	%	N	%
Traceability of web-based performance of altmetrics	49	17.2	59	20.7	17	6.0	79	27.7	81	28.4
Prompt measurement of research article performance	44	15.5	34	11.9	20	7.0	102	35.8	85	29.8
Transparency in what is measured and how it is measured	56	19.6	49	17.2	15	5.3	79	27.7	86	30.2
I make use of altmetrics to update my research performance	25	8.8	41	14.4	30	10.5	114	40.0	75	26.3
Being savvy in the use of social media and other media	92	32.3	84	29.5	26	9.1	37	13.0	46	16.1

Source: **Author's Fieldwork (2020) (N.B.: SA+A=Agreed, SD+D=Disagreed)**

Table 5 shows that 108(37.9%) of the respondents agreed that the traceability of web-based performance of altmetrics is the reason they use it to measure research impact, 17(6.0%) were neutral and 160(56.1%) disagreed. This indicates that more than half of the respondents disagreed that the traceability of web-based performance of altmetrics is the reasons they use

altmetrics to measure research impact. Table 5 shows that 78(27.4%) of the respondents agreed that prompt measurement of research article performance is the reason they use altmetrics to measure research impact, 20(7.0%) were neutral and 187(65.6%) disagreed. This implies that most of the respondents disagreed that prompt measurement of research article performance is the reason they use altmetrics to measure research impact. Moreover, Table 5 illustrates that 105(36.8%) agreed that transparency in what is measured is the reason they use altmetrics to measure research impact, 15(5.3%) were neutral and 165(57.9%) disagreed. This shows that more than half of the respondents disagreed that transparency in what is measured is the reason they use altmetrics to measure research impact.

It can be seen in Table 5 that 66(23.2%) agreed that they make use of altmetrics to update their research performance, 30(10.5%) were neutral and 189(66.3%) disagreed. This implies that most of the respondents disagreed that they make use of altmetrics to update their research performance. It is shown in Table 5 that 176(61.8%) agreed that being savvy in the use of social media is a reason for them to use altmetrics to measure research impact, 26(6.1%) were neutral and 83(29.1%) disagreed. This indicates that most of the respondents agreed that being savvy in the use of social media is a reason for them to use altmetrics to measure research impact.

Table 6: Media where Nigerian librarians seek altmetrics for scholarly works

Items	Frequency	Percentage (%)
Twitter	123	43.2
Facebook	75	26.3
LinkedIn	112	39.3
Blogs	77	27.0
Others	100	35.1

Source: **Author's Fieldwork (2020)**

Table 6 shows that less than half of the respondents (43.2%) seek altmetrics for their works on Twitter. This indicates that Twitter was used by less than half of the respondents to communicate their research articles. Moreover, Table 6 shows that less than half of the respondents (35.1%) use other media aside from Twitter, Facebook, LinkedIn and blogs to communicate their research articles. It is shown in Tabe 6 that less than half of the respondents use social media such as Facebook and LinkedIn to communicate their research articles. Furthermore, it can be seen in Table 6 that around a quarter of Nigeria librarians use blogs to

seek altmetrics for their scholarly works. This implies that large chunk of Nigerian librarians do not use blogs to communicate their research articles.

Test of Hypotheses

H_{01}: There is no significant relationship between awareness and use of altmetrics to measure research performance

Table 7: Relationship between awareness and use of altmetrics to measure research articles

Variables	N	df	R-value	*P*-value	Remark
Awareness Use of altmetrics	285	283	.482**	.022	Sig…

** Correlation is significant at 0.01 level (2-tailed)

Table 7 presents the results of the null hypothesis, which states that there is no significant relationship between awareness and use of altmetrics to measure research performance. It is shown in the Table that the degree of freedom is 283 with a r-value of 0.482. The *P*-value is .022, which is lower than the 0.05 that is the level of significance. Therefore, the null hypothesis will thereby be rejected. Premise upon this, it can be stated that there is significant relationship between awareness and use of altmetrics to measure research performance.

H_{02}: There is no significant relationship between librarians' knowledge and use of altmetrics to measure research performance

Table 8: Relationship between perceived knowledge and use of altmetrics

Variables	N	df	R-value	*P*-value	Remark
Perceived knowledge Use of altmetrics	285	283	.374**	.039	Sig…

** Correlation is significant at 0.01 level (2-tailed)

Table 8 shows the result of the second null hypothesis which states that there is no significant relationship between librarians' knowledge and use of altmetrics to measure research performance. It can be seen in the Table that the degree of freedom is 283, which was derived by (N-2), where N represents the sample size. The r-value is .374. The *P*-value is .039, which is lower than the level of significance of 0.05. Therefore, the null hypothesis will be rejected. Consequently, it is found that there is significant relationship between knowledge and use of altmetrics as measure of research performance.

DISCUSSION OF FINDINGS

The study findings show that most of the Nigerian librarians are not aware that altmetrics tools, which are also known as alternative metrics, are non-traditional metrics tools. González-Fernández-Villavicencio *et al*. (2015) found that half of Spanish academic librarians were aware that altmetrics are non-traditional metrics tools. Ferrier-Watson (2019) show that faculty in Sciences reported the greatest awareness of altmetrics. Results indicate that most of the Nigerian librarians were not aware that altmetrics track citations of research entity on social media and press. Vinyard and Colvin (2018) show that there is awareness of altmetrics to track citations. It was found that most Nigerian librarians did not believe that altmetrics reflect value of research works more than traditional citation count. It was also shown in the findings that more than half of the Nigerian librarians were not aware that altmetrics crawled data from various non-journal articles media. Results show that most of the Nigerian librarians view altmetrics as complement to traditional citation count. Similarly, Nordfeldt (2015) found that Library and Information Science (LIS) professionals in Swedish university libraries were aware of altmetrics as complement to the traditional citation count. This confirms that altmetrics tools are only use as secondary research metrics tools by librarians. Sutton *et al.* (2018) found that most of LIS faculty in the United States and Canadian graduate LIS programs had some awareness of altmetrics. Aung, Erdt and Theng (2017) however revealed that there is possibility for non-faculty staff members to be more aware of altmetrics.

The results of this study show that most of the Nigerian librarians did not have knowledge of how altmetrics count citations. Sutton *et al.* (2018) found that there is greater knowledge with traditional measures of research impact than non-traditional measure such as altmetrics. It was found that significant number of the Nigerian librarians did not have knowledge on the usage of altmetrics. It was revealed that a large part of the Nigerian librarians were not familiar with the use of altmetrics in measuring research impact. This is similar to the findings of Miles *et al.* (2018) that academic librarians are least familiar with altmetrics. Considering that the academic librarians constitute (80.3%) largest percentage of the respondents in this study, it may be possible that the lack of familiarity with altmetrics stem from their large representation. The findings show that most of the Nigerian librarians did not have knowledge on using altmetrics to measure research impact. It was shown in the findings that most of the Nigerian librarians view altmetrics to be unpopular among librarians as tools to measure research

impact or performance. DeSanto and Nichols (2017) show that altmetrics tools were not popular amongst faculty members of University of Vermont, United States.

The results of this study show that more than half of the Nigerian librarians did not use altmetrics for academic promotion. This is dissimilar to the findings of Haddow and Hammerfelt (2019) that altmetrics were used for academic promotion. In fact, Ferrier-Watson (2019) show that faculty suggests that traditional metrics should play lesser role in academic promotion compared to altmetrics. This may be difficult to put into practice among Nigerian librarians with the low awareness of altmetrics. It was found that more than half of the Nigerian librarians did not use altmetrics for research grants applications. This is in contrast with the findings of Haddow and Hammarfel (2019) that altmetrics were used for grant applications. It was revealed that less than half of the Nigerian librarians used altmetrics for award/recognition. It was shown in the findings that most Nigerian librarians did not use altmetrics for research assessment. However, it was found that more than half of Nigerian librarians used altmetrics to determine quality of journal. Similarly, it was found by Vinyard and Colvin (2018) that many librarians used altmetrics to assess journal quality. Based on the foregoing, all the factors that may influence the usage of altmetrics were mostly absent among Nigerian librarians except for the fact that they used it to assess journal quality.

Results of this study show that more than half of the Nigerian librarians did not use altmetrics as research metrics owing to its traceability of web-based performance. It was found that most of the Nigerian librarians did not use altmetrics as research metrics because of its prompt measurement of research performance. It was revealed that more than half of the Nigerian librarians did not use altmetrics as research metrics owing to its transparency in research performance measurement and how it is measured. These findings show that most Nigerian librarians were not using altmetrics to leverage various social media tools in research assessment. Wouters and Costas (2012) outlined some advantages of using altmetrics over traditional metrics to include diversity of sources, traceability of web-based performance, prompt measurement of performance and the transparency in what is measured and how. It was found that most of the Nigerian librarians did not use altmetrics to update their research performance. This is different from the findings of Thuna and King (2017) that most faculty members in the University of Toronto, Ontario, Canada.

The results of this study show that less than half of Nigerian librarians seek altmetrics for their research works on Twitter. Roemer and Borchardt (2015) revealed that librarians used Twitter to share their research works owing to the ensuing benefit it provides as mechanism for quantitative evaluation of scholarly activities with a few methods for evaluative measures. Moreover, it was found that less than half of Nigerian librarians use Facebook and LinkedIn. It is quite dissimilar to the findings of Aung *et al.* (2017) that most used altmetrics are mentions and shares on social networks such as Facebook and LinkedIn. It was however shown by Roemer and Borchardt (2015) that many librarians make use of blogs in seeking altmetrics. It was also found that less than half of the Nigerian librarians use blog to seek altmetrics for their research works. This is different from the findings of Aung *et al.* (2017) that the most popular mentions were found to be those in blog posts and topics in a forum. It was revealed that less than half of Nigerian librarians use other means aside from the abovementioned to seek altmetrics for their research works. The findings of the study show that there was no statistically significant relationship between Nigerian librarians' awareness and use of altmetrics to measure research performance. It was also revealed that there was no statistically significant relationship between Nigerian librarians' perceived knowledge and use of altmetrics to measure research performance. Aung *et al.* (2017) found that there is positive relationship between usage of social media and altmetrics.

CONCLUSION

This study established that most Nigerian librarians are not aware of altmetrics as non-traditional complement to traditional citation count. It was also recognized that most Nigerian librarians do not have the awareness on how to make use of altmetrics to measure research impact. Moreover, it was indicated that most Nigerian librarians do not use altmetrics for academic promotion, award/recognitions nor do they use the tools for research grant applications. However, Nigerian librarians use altmetrics to determine the quality of journal. It was also concluded that Nigerian librarians did not use various social media tools to seek altmetrics compared to other social media networks such as Facebook and LinkedIn which have very minimal usage.

RECOMMENDATION

       Based on the findings of this study, the following recommendations are made:

1. It is recommended that Nigerian librarians should be made to be aware and familiarized with the usage of altmetrics to measure research impact.

2. Nigerian librarians should be trained on how altmetrics count citations and its usage in measuring research impact.

3. Since Nigerian librarians check altmetrics to determine quality of journal, Nigerian journal editors should endeavour to display their altmetrics on their journal websites.

4. Nigerian librarians should endeavour to seek altmetrics on social networks platforms such as LinkedIn in order to boost their academic profile and opportunities.

5. Nigerian librarians should be encouraged to make academic use of their social networks profile to improve their altmetrics.

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