

RESEARCH PAPER

CELEBRATING MORE THAN THREE DECADES OF SCHOLARLY PUBLISHING: A BIBLIOMETRIC ANALYSIS OF THE JOURNAL OF SCIENCE AND TECHNOLOGY (JUST)

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ABSTRACT

This study seeks to showcase the scholarly contribution of the Journal of Science and Technology (JUST). Bibliometrics is a quantitative approach used in library and information sciences to describe publication patterns within a given field or body of literature. Data for this study were extracted manually from the JUST homepage and African Journal Online (AJOL) platforms. The study results revealed that more multiple authors have contributed to the Journal than single authors. Collaboration in the Journal is more at the institutional than national and international levels. There were fluctuations in the number of publications in the Journal. This was due to inconsistencies in the number of issues per volume and articles per issue in a year. It also revealed that authors from the Kwame Nkrumah University of Science and Technology (KNUST) and researchers from Ghana, in general, dominated the total number of articles published by the Journal. Some recommendations, such as aggressive marketing of the Journal on social media, indexation, and abstraction in reputable databases, were made to improve the outlook of the Journal to encourage more contributions to the Journal.

Keywords: Bibliometrics, bibliometric study, scholarly communication, publishing, JUST, KNUST

INTRODUCTION

Bibliometrics refers to applying mathematics and statistical methods to the analysis of academic publications (Pritchard, 1969). It is thus a quantitative approach used in library and information sciences to describe publication patterns within a given field or body of literature (Hyland & Jiang, 2021). A bibliometric analysis complements the general overviews of a phenomenon in a formal and objective way by mapping the research field in a systematic, transparent, and reproducible way (Garfield, 1979). It also helps to guide those scholars interested in conducting research in a specific field toward the most debated topics and to select the most adequate methodologies and the right journals to publish (Buttice & Ughetto, 2021) (Cancino et al., 2017). It is also indicated in the extant literature that, bibliometrics are conducted when a journal is marking an anniversary (Barley, 2016), a review (Van Fleet et al., 2006), or a special issue (Meyer & Winer, 2014).

In literature, several bibliometric studies have been conducted on many issues. While some of these bibliometric studies have focused on topics and journals, others have also concentrated on universities and countries (Cancino et al., 2017). The bibliometric studies that focused on topics are the ones conducted by Islam et al. (2022) on information literacy, Blanco-Mesa et al. (2017) and Yu et al. (2016) on decision making, Buttice and Ughetto (2021) on crowdfunding and Garg and Singh (2022) on library and information science research. Other bibliometric studies with their focus on topics are from Hyland and Jiang (2021) on English for Academic Purposes (EAP), Barbosa (2021) on agri-food supply chain management, Yu and He (2020) on energy efficiency, Tran et al. (2019) on artificial intelligence, Dabbagh et al. (2019) on blockchain, Kamran et al. (2020) on blockchain and Internet of Things, Ferreira et al. (2021); Rovelli et al. (2022) and Wu et

al. (2022) on family business, Vallaster et al. (2019) on ethics and entrepreneurship, Tan et al. (2021) on green energy and environmental technologies and Choi et al. (2021) on smart home and internet of things.

Bibliometrics focusing on journals include those conducted by Cancino et al. (2017) on Computers & Industrial Engineering, Martínez-López et al. (2018) on the European Journal of Marketing, Gaviria-Marin et al. (2018) on the Journal of Knowledge Management, Barik and Jena (2013) on the Journal of Knowledge Management Practice, (Naudé, 2016) on the Electronic Journal of Information Systems in Developing Countries. Others are Willett (2022) on the Journal of Molecular Graphics and Modelling, Brandt and Skupski (2022) on the Journal of Perinatal Medicine, Garcés-Gómez and Henao-Céspedes (2022) on the International Journal of Electrical and Computer Engineering, Donthu et al. (2022) on the Journal of Product and Brand Management, Froese et al. (2022) on the Asian Business and Management, Donthu et al. (2022) on the Canadian Journal of Administrative Sciences, Donthu et al. (2022) on the Journal of Enterprise Information Management, Viglia et al. (2022) on the Service Industries Journal, Meo et al. (2021) on the Journal of King Saud University – Science, Tella and Olabooye (2014) on the African Journal of Library, Archives and Information Science, Dhiab et al. (2021) on Operations Management Research and Najaf et al. (2022) on the Journal of Accounting in Emerging Economies.

Bibliometric studies on countries include Lancho-Barrantes and Cantú-Ortiz (2019) on Science in Mexico, Abu-Bonsrah et al. (2023) on neurosurgical literature in Ghana, Wang and Hsieh (2022) on China studies, Sweileh (2022) on the contribution of researchers in Arab countries to scientific publications, Lovakov et al. (2022) on research output in the post-Soviet region, Herrera-Franco et al.

(2021) on scientific research in Ecuador, Kim (2001) on physics publications in Korea.

Bibliometric studies with the concentration on universities include Hinojo-Lucena *et al* (2019) on Open Universities; Iping *et al* (2022) on the Dutch university medical centres; Ahmed and Al-Reyae (2019) on Al-Jouf University, Saudi Arabia; Mazov and Gureev (2017) on Novosibirsk State University; Baby and Kumaravel (2012) on Periyar University; van Leeuwen *et al* (2016) on a Dutch university; Ahmad *et al* (2020) on the University of the Punjab; Mokhnacheva and Kharybina (2011) on RAS institutions and Russian universities; Mokhtari, Mirezati, Saberi, Fazli and Kharabati-Neshin (2019) on Hamadan University of Medical Sciences; Patel and Bhatt (2021) on Sardar Patel University; Maharana (2012) on Orissa University of Agricultural Technology; Maharana and Sethi (2013) on Sambalpur University; Siwach and Kumar (2015) on Maharshi Dayanand University; Rohtak *et al* (2018) on CCS Haryana Agricultural University, Hisar; and Doulani (2020) on Alzahra University.

THE JOURNAL OF SCIENCE AND TECHNOLOGY (JUST)

The Journal of Science and Technology (JUST), created in 1988, is a leading international multidisciplinary journal that publishes scholarly research from various aspects of academic endeavour broadly classified as Science (physical, biological and chemical), humanities, and technology. The Journal is indexed in African Journals Online (AJOL) and published by the Kwame Nkrumah University of Science and Technology (KNUST). The Journal started with two issues in 1988 and, between 1989-2002, published three issues per year. In 2003 the Journal published one issue. Between 2004-2005, the Journal published two issues per year; between 2006-2017 and 2020, the Journal reverted to

three issues per year. From 2021 to date, the Journal is now publishing twice a year, with June and December being months in which issues one and two are published.

The Editorial Committee first screens manuscripts, submitted to the Journal to see whether the manuscript meets the Journal's general guidelines. Manuscripts that meet the Journal's general guidelines are sent to two (2) blind reviewers/assessors. The Editor-in-Chief and the Editors of the journal decide about the acceptability or otherwise of a submitted manuscript. The Journal is published through an Open Journal System as part of the Public Knowledge Project (PKP) (JUST, n.d.).

Bibliometric description of a journal provides general historical results that allow the development of a critical evaluation of its impact and evolution (Schwert, 1993). This article therefore, presents a study that assesses the scholarly contribution and influence of the Journal of Science and Technology (JUST). This study shows the contribution of scholarship by type of authorship, collaboration, number of publications per year, institutional and country affiliations, and the subject areas of contributors. In doing so, the study uses the African Journals Online (AJOL) and the journal's website to collect and analyse the bibliographic details of the articles published by the Journal.

Objectives

The objectives of this paper are the following:

1. to identify the type of authorship;
2. to establish the level of collaboration;
3. to identify the number of publications per year;
4. to assess the level of institutional and country affiliation;
5. to ascertain the subject areas of contributors; and

6. to make recommendations to increase the patronage and use of the Journal.

MATERIALS AND METHODS

Bibliometric indicators are very useful for representing bibliographic material (Cancino et al., 2017). The indicators, among others, include the total number of papers and citations to measure productivity and influence, the cites per paper, h-index, citation thresholds that measure the number of documents above several citations, and the number of documents per person (Cancino et al., 2017; van Leeuwen et al., 2016). The bibliometric data for the study were extracted manually from the Journal's homepage (<https://just.knust.edu.gh/index.php?journal=just>) and African Journal Online (AJOL) (<https://www.ajol.info/index.php/just>) platform. The extracted data included authorship (single or multiple), collaboration (institutional, national, and international), authors' affiliated institutions, authors' country of affiliation, publication per year, and discipline or subject areas of contributors. Data spanning 34 years, from 1988 to 2022 were collected for this study. A total of 891 articles with the required information extracted manually were used in this study. The Statistical Package for the Social Sciences (SPSS) and Microsoft Excel were used for the analysis. Descriptive statistics were used to summarize the data. The data were presented in frequencies, percentages and illustrated in tables and charts where appropriate.

RESULTS AND DISCUSSION

Type of Authorship

The first part of the study sought to find out the type of contributors (see Figure 1 and 2) to JUST. As shown in Figure 1, more than half (60.6%) of the contributors to the Journal are multiple authors. This result confirms Gavia-Marín et al. (2018) and Naudé (2016) studies, which revealed that more than half of the documents submitted to the Journal of Knowledge Management and Electronic Journal of Information Systems in Developing Countries were written by two or three co-authors. However, this result goes counter to three similar studies by (Barik & Jena, 2013; Park, 2010; Thanuksodi, 2011) of the Journal of Knowledge Management Practice, D-Lab Magazine and Library Herald Journal, which reported more single authors contributing to the journals than multiple authors. It should be noted that the journal started with the publication of more single authors than multiple authors (see Figure 2). A change began in 1994 and peaked after 2002 when the Journal began publishing papers from multiple authors (see Figure 2). Given the fact that the issue of collaboration and, for that matter, multiple authorship is of recent development, contributions by multiple authors to the Journal have gradually become far more than by single authors. It must be noted further that there were more multiple authors in JUST between 2005 and 2017 than single authors (see Figure 2). No single author contributed to the Journal from 2020 to 2022. In the future, looking at the contribution trend to the Journal, there is a high possibility that the Journal will receive more multiple authors than single authors.

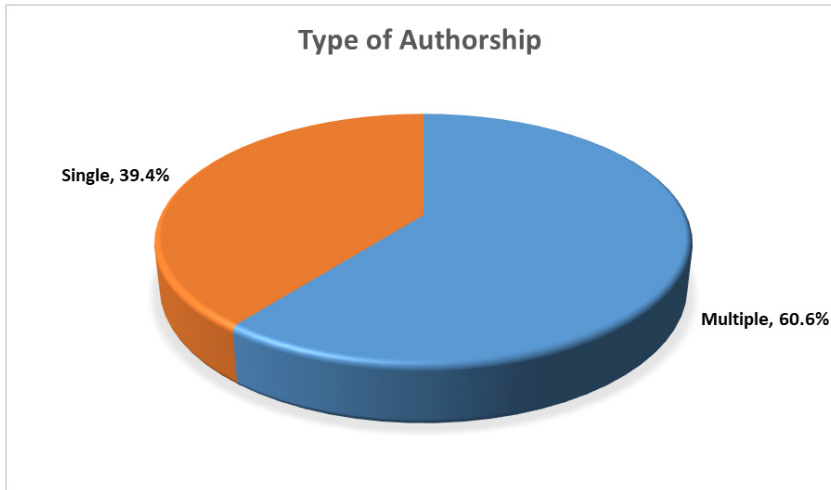


Figure 1: Type of authorship

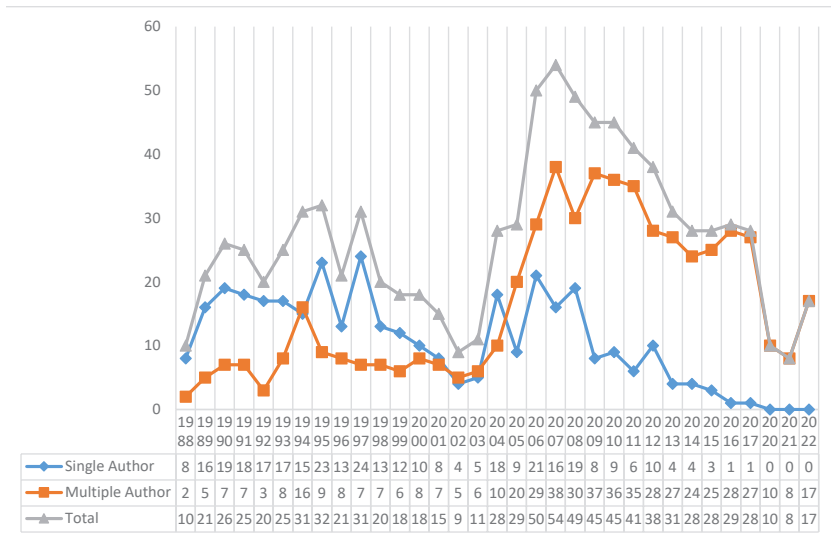


Figure 2: Authorship per year

Type of Collaboration

The second part of the study presents the extent of collaboration among contributors to the Journal (see Figure 3). As the Figure shows, 68% of the Journal's contributions are at the institutional level. These are institutions to which the contributors to this Journal belong. This finding confirms an earlier study by Naudé (2016), where more than

80% of the collaboration in his study was at the institutional level. This is not surprising because, generally, collaborations for research start primarily at the institutional level before it assumes national or international dimension. Many researchers are most likely to collaborate with colleagues in their respective institutions before seeking others to join the team from elsewhere.

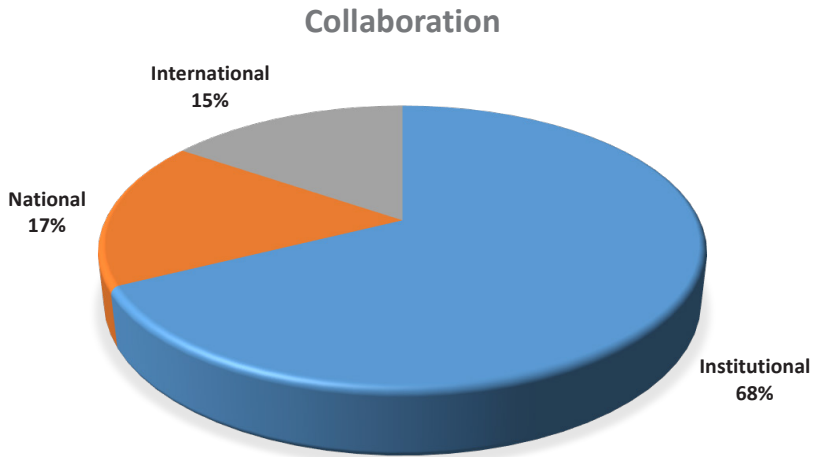


Figure 3: Type of collaboration

Number of Publications Per Year

The third part of the study presents statistics about the number of publications yearly by the Journal (see Figure 4). The year with the highest number of articles (54) published in the Journal is 2007. 2006, 2008, 2009, 2010, 2011, and 2012 had 50, 49, 45, 41, and 38 articles published in the Journal. The fluctuations in the number of publications in the Journal stem from the inconsistencies in the number of issues per volume and articles per issue. For instance, the Journal began with two issues in 1988 but, between 1989-2002, reverted to three issues per year.

In 2003 the Journal published one issue. Then between 2004-2005, the Journal began again with two yearly issues. Between 2006-2017 and 2020, the Journal reverted to three issues per year. From 2021 to date, the Journal is now publishing twice a year. This result is consistent with Naudé (2016) study of the Electronic Journal of Information Systems in Developing Countries, which found publication output inconsistent from year to year.

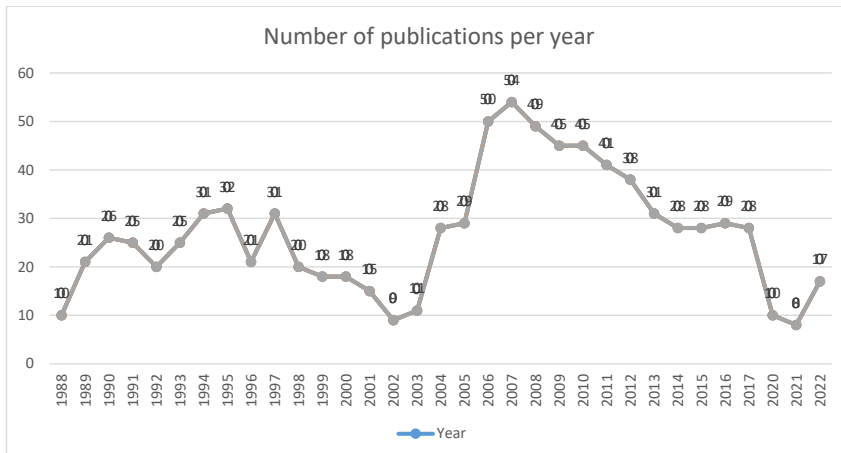


Figure 4: Publications per year

Institutional Affiliation of Authors

The fourth part of the study presents statistics about the institutional affiliation of contributors to JUST (see Figure 5). Authors published research articles in JUST from 151 institutions in the past 34 years across five continents: Africa, Asia, Australia, Europe, and America. In the Journal’s history, authors from KNUST dominate with (63.1%), followed by CSIR (3.8%), University of Ghana (2.9%), Federal University of Technology, Akure (FUTA) (2.5%), University of Ibadan (2.1%), University of Benin (2.0%), Obafemi Awolowo University (1.7%), University of Cape Coast (1.6%), University of Nigeria (1.6%), University of Lagos (1.2%), University for Development Studies (1.0%), University of Ilorin (0.8%), Federal University of Agriculture, Abeokuta (0.7%), University of Agriculture, Makurdi (0.7%), Ghana Atomic Energy Commission (0.7%), University of Education, Winneba (0.5%), Avagh University, Faizabed (U.P) India (0.3%), Cocoa Research Institute of Ghana (0.3%), Jomo Kenyatta University of Agriculture & Technology JKUAT (0.3%), Komfo Anokye Teaching Hospital (0.3%), Imperial College (0.3%), Tshwane (0.3%), University of Technology (0.3%), University of Birmingham (0.3%), University of Dar es Salaam (0.3%). The

24 institutions listed above represent more than 80% of total submissions to the Journal over the years under review. This result is consistent with Naudé (2016) study, in which more than 86% of the contributors to the Electronic Journal of Information Systems in Developing Countries come from a university or academic background. However, the rest of the 127 institutions combined with (Others) had about 11% of total submissions. This should not come as a surprise to many about the dominance of authors from KNUST in JUST. Since KNUST is the host institution of the Journal, there is no doubt that the authors of KNUST will contribute to the Journal more than others from different institutions. Even though authors from KNUST contributed more articles to the Journal, more Nigerian institutions in the top 20 contributed to the Journal than Ghanaian institutions.



Figure 5: Institutional affiliation of authors

Background of Authors

The fifth part of the study presents the results of the background of contributors to the Journal (see Figure 6). Contributors to the Journal came from six broad disciplines: Agriculture, Art, Education and Built Environment, Arts and Social Sciences, Engineering, Health Sciences, and Science. Authors coming from the broad discipline of Agriculture contributed fairly more articles (21.9%) to the Journal than those from Science (20.3%), Health Sciences (18.9%), Engineering (17.6%), and Art, Education, and

Built Environment (14.5%). The discipline with the least contribution to the Journal was the Arts and the Social Sciences.

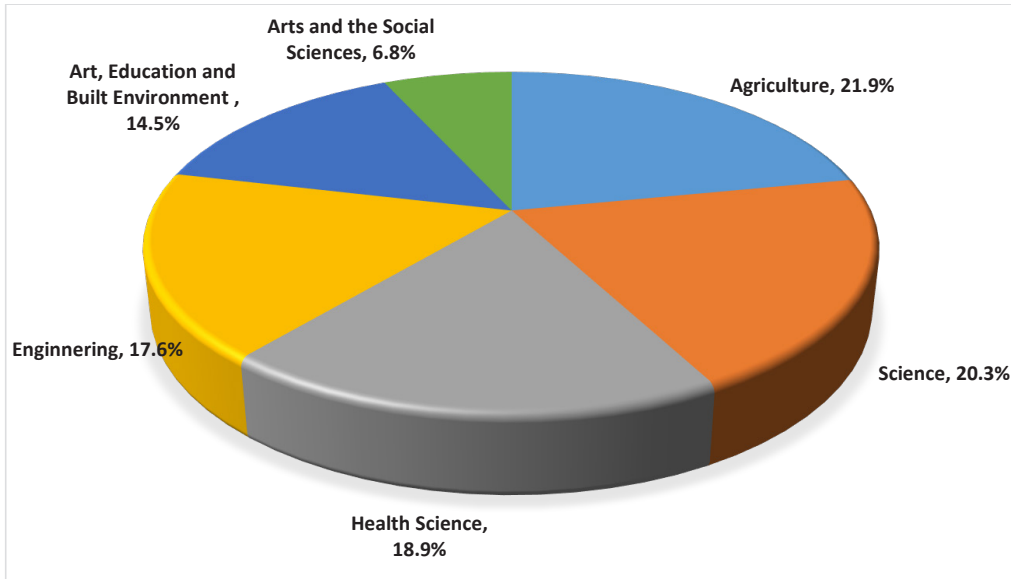


Figure 6: Background of authors

Geographical Location of Authors

The final part of the study presents the results of the geographical location of contributors to JUST (see Figure 7). Authors published research articles in JUST from at least 26 countries across five continents in the past 34 years. It should be noted, though, that these numbers do not account for articles by contributors who are based in one country but whose research context is in another country. Across the entire Journal's history, Ghana represents (70%) of all articles published, followed by Nigeria (10.5%), the UK (2.8%), and the US (1.1%).

This result is consistent with two earlier studies by Martínez-López et al. (2018) of the *European Journal of Marketing* and Tella & Aisha Olabooye (2014) of the *African Journal of Library, Archives and Information Science*, where British and Nigerian authors were mentioned to be leading the ranking with the number of submissions to each journal respectively. The results, therefore, indicate a relatively strong Ghanaian identity in JUST. However, when viewing the overall country contributions across the past 34 years, five continents (regions) are represented, indicating that JUST is increasingly progressing towards internationalization.

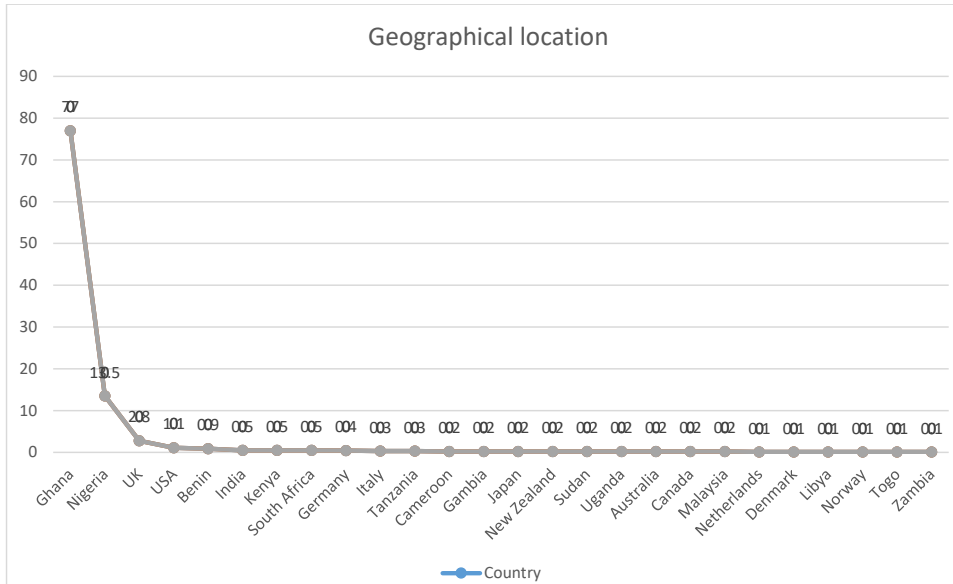


Figure 7: Geographical location

CONCLUSION AND RECOMMENDATIONS

Bibliometrics is a quantitative approach used in library and information sciences to describe publication patterns within a given field or body of literature. A bibliometric analysis complements the general overviews of a phenomenon formally and objectively by mapping the research field in a systematic, transparent, and reproducible way. In this study, the researchers assessed the scholarly contribution of JUST. The study results revealed that multiple authors had contributed more to the Journal than single authors and collaboration in the Journal is more at the institutional than national and international levels. Additionally, there were fluctuations in the number of publications in the Journal due to inconsistencies in the number of issues per volume and articles per issue in a year. Authors from KNUST and researchers from Ghana dominated the total number of articles published by the Journal. This notwithstanding, the Journal should

aggressively market itself on social media to gain the attention of potential authors, grow the Journal audience, and better engage readers interested in the research that has been published. Authors should also be encouraged to create social media handles to create awareness and use of their published articles. When authors do this, it will indirectly project the Journal in which the article was published. The Journal should also seek indexing and abstracting in other international indexing and abstracting databases such as the Directory of Open Access Journals (DOAJ), Scopus, Web of Science, ProQuest, and EBSCO. These indexing and abstracting databases will make the Journal more attractive to potential authors and contributors worldwide.

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