Exploring the Research Landscape in Malaysian Higher Education: A Scopus-Based Analysis of Publications from 2018 to 2022

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Abstract. All Malaysian institutes of higher education have increased their research due to the relevance of publications. In this study, academic publications from the renowned SCOPUS database were examined. The study aimed to show: 1) The total number of publications from Malaysia in the Scopus database between 2018 and 2022, 2) To identify active authors in Malaysia in the Scopus database between 2018 and 2022. 3) To identify active institutions in the Scopus database between 2018 and 2022 and 4) To determine the subject covered by the published works in the Scopus database between 2018 and 2022. The study confined its scope to the publications produced between 2018 and 2022 by Malaysian authors published in Malaysia as well as abroad. The number of publications that most Malaysian universities put out is strongly influenced by factors like funding, training, resistance to change, and job satisfaction.

Keywords: Malaysia publication productivity, research publication productivity, Malaysian universities, Malaysian research universities, information management

1   Introduction

An increase in publication output indicates that Malaysia has made significant advances in the field of research in recent years. It is impossible to exaggerate the importance of academic publications because they serve as a major source of knowledge creation. Together with their participation, researchers generate fresh information that contributes to the advancement of science and diverse sectors. Malaysia's publishing

productivity strives to improve the country's economic and reputational status by boosting the ranks of its institutions.

Che Daud, Husaini, Mohd Ariff, and Kumar (2022) emphasise the importance of bibliometric analysis in identifying current trends in the literature and providing advice for future research. Bibliometric analysis is one of the well known method for analyze huge number of scientific data (Naveen, Satis, Debmalya, Nitesh, and Weng, 2021). In bibliometric studies, data on the number of documents published by an organization or a nation, research teams or people, with the highest scientific production, may be found (Orjuela, 2010). In Malaysia, publishing productivity is an important part of academic achievement and has been connected to the country's institutions' economic and reputational positions. Funding, designation, mentoring, and training have all been demonstrated to have an impact on publishing production in Malaysia. Scholarly publications have evolved into important sources of current data for societal advancement and development. In Malaysia, there has been a trend towards emphasising the productivity of publications and citations, resulting in the introduction of several scientometric metrics to assess publication productivity. The positive association between the number of publications and citations implies that the publication rate has a significant impact on the publication of highly cited articles, contributing to the prestige of Malaysian scientists and institutions. However, a thorough assessment of the factors influencing publication output in Malaysia is required. Overall, the data emphasise the significance of publication productivity in Malaysia and the need for additional research to uncover the elements that influence it.

It is vital to analyse research efforts in all scientific fields in order to observe the evolution of each field and assure its progress and development. Bibliometric analysis is a technique used to track the evolution of Malaysian scientific publications. Bibliometrics is the application of analytical units, such as the number of researchers or authors, articles, keywords, journals, citations, and institutions that form references, to track the development or evolution of science or disciplines. The Scopus database offers a comprehensive and robust bibliometric analysis tool. It contains built-in analysis skills for creating representative figures and covers practically all of the key research articles.

In this study, we intend to examine the publication output of Malaysian institutions of higher education by analysing scholarly works from the renowned SCOPUS database. SCOPUS database is chosen in this study because currently it the most well-known and largest abstract and bibliographic database of peer-reviewed literature. Specifically, we aim to determine the total number of Malaysian publications in the SCOPUS databases for a 5-year period, between 2018 and 2022, the active authors and institutions, and the subjects covered by the published works. Understanding the current status of scientific research in Malaysia and identifying opportunities for development requires a study of publication productivity in Malaysia.

According to the preceding information, there are multiple reasons to perform a study on publication productivity in Malaysia. Due to the importance of publications, Malaysian institutions of higher education have increased their scientific research and publications.

This demonstrates an increasing national interest in and investment in research and development:

1.The total number and spread of publications produced by Malaysia in the Scopus database between 2018 and 2022

2.Identifying active authors in Malaysia in the Scopus database between 2018 and 2022

3.Identifying active institutions in the Scopus database between 2018 and 2022

4.Determine the subject covered by the published works in the Scopus database between 2018 and 2022

This publishing productivity study in Malaysia is crucial for assessing the current condition of research in the country, finding areas for improvement, and directing future research activities.

2   Literature Review

Arnold and Voigt (2017) assert that the central endeavour of knowledge construction lies in research, wherein the researcher, co-researchers, and participants collectively engage in knowledge production. The authors argue that the characteristics of research are contingent upon its subject matter, disciplinary domain, and typology. According to Islam and Samsudin (2020), variations in research characteristics can be observed based on factors such as the topic, field, and type of research. The authors suggest that a comprehensive comprehension of these characteristics is imperative for the execution and assurance of research quality.Budisantoso and Mungkasi (2020) highlight the significance of scientific publications in the Malaysian context, highlighting their role in enhancing the reputation and economic standing of the country's institutions, ultimately leading to improved rankings for Malaysian universities. The authors assert that bibliometric analysis has the potential to effectively monitor the trajectory and advancement of scholarly publications within the context of Malaysia.

According to Liu and Yang (2019), a comprehensive comprehension of the research activities pertaining to a scientific topic is essential in order to observe its evolution and progression. The proponents assert that bibliometric analysis possesses the capability to track the progression of scientific subjects and offer valuable insights into their evolutionary trajectory.

The significance of collaboration in research has been growing in importance for scientists, research institutions, and policymakers alike. Several studies have been conducted on this topic (Wagner and Leydesdorff, 2005; Cummings and Kiesler, 2007; Bammer, 2008). The literature frequently highlights several benefits of research collaboration, including the sharing of knowledge and methodologies, the cross-pollination of ideas, the pooling of research resources and expensive instruments, the enhancement of visibility and recognition, and the acceleration of research progress. In their study, Vuong et al. (2018) put forth the proposition that research production could be enhanced through international collaboration. However, it is worth noting that this effect is relatively modest when it comes to writers who have already demonstrated high levels of performance. Aksnes, Piro, and Rorstad (2019) assert that there

is an unequal distribution of men and women across various fields. The prevalence of female scholars is observed to be higher in regions characterised by lower rates of international collaboration.

In their study, Che Daud, Husaini, Mohd Ariff, and Kumar (2022) investigate the various environmental and human factors that have an impact on publication output within the context of Malaysia. The primary determinant of publication productivity was found to be funding, while factors such as researchers' designation, mentoring, and training were found to have comparatively lesser impacts. In addition, it has been acknowledged that institutional variables, such as resistance to change and levels of job satisfaction, play a significant role in contributing to Malaysia's comparatively lower publication output. The study revealed that scholars who had fewer teaching responsibilities, allocated more time to research, and actively engaged in international conferences demonstrated a higher level of publication output within certain academic institutions. The findings of this study underscore the importance of financial support in enhancing overall publication productivity and mitigating the influence of individual factors on the quantity of scholarly publications within Malaysia's academic community.

Wahid, Warraich, and Tahira (2022) recently conducted a study in which they looked at the factors that affect scholarly publication. The findings of this study indicated that funding, collaboration, time allocation, academic rank, and academic qualification emerged as significant factors that are closely associated with publication productivity.

In their recent publication, Panahi, Lotfi, and Ouchi (2022) delve into the utilisation of bibliometric analysis as a means to track the progression of scientific disciplines or domains. The authors propose that bibliometric analysis employs various analytical units, including the number of researchers or authors, articles, keywords, journals, citations, and institutions, in order to monitor the advancement of scientific domains. It is noted by the authors that the Scopus database encompasses a comprehensive collection of pertinent research papers and offers integrated analytical tools to generate representative findings.

3   Resources and Method

The present study utilised the SCOPUS database to examine the aggregate quantity of publications produced by authors from Malaysia as well as the breadth of subject matter covered in these articles. The study population comprised articles published between 2018 and 2022 within various subfields falling under the domain of "resources and materials." These articles were included in the analysis if they were indexed in Scopus.To examine the total quantity of articles authored by Malaysian writers and their geographical distribution, an advanced search incorporating Boolean operators was employed. The implementation of this system enables the comprehensive retrieval of intricate information from a diverse range of scientific publications across various domains. The dataset comprised various elements, such as the title of the article, the name of the journal, the year of publication, the author's name, a set of

keywords, the author's affiliation, an abstract, the document type, the source type, the topic area, the language, the number of citations, and the countries involved in the research.

In order to ascertain the research trends in Malaysia from 2018 to 2022, a comprehensive search was undertaken. The search involved examining the credentials of 1,046 papers sourced from the Scopus database.

The following search strategy was used to find publications in the SCOPUS database: TITLE-ABS-KEY-AUTH (malaysia AND author) AND (LIMIT-TO (PUBYEAR, 2022) OR LIMIT-TO (PUBYEAR, 2021) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR , 2018)

This study aims to examine the comprehensive scope and distribution of publications originating from Malaysia as documented in the Scopus databases during the period from 2018 to 2022.

Table 1: Number of publications by Malaysian authors in the SCOPUS database from 2018 to 2022
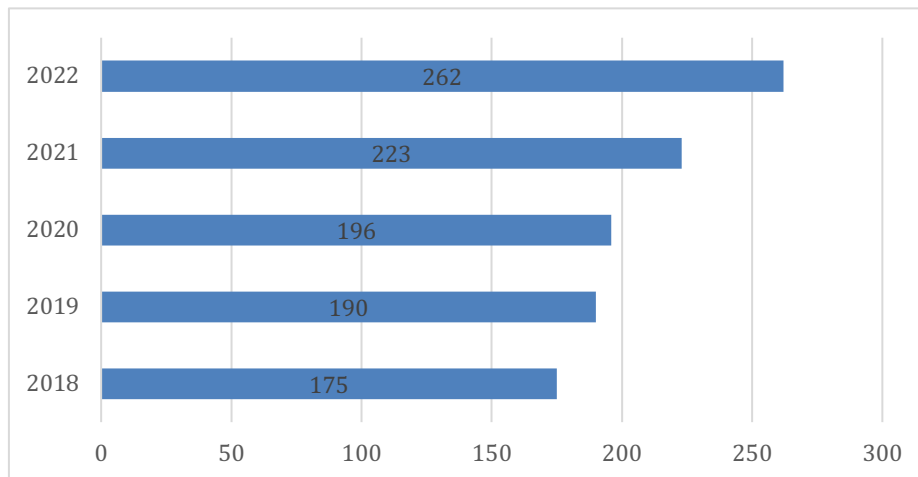
Table 1 presents the observed increase in the quantity of publications generated by authors from Malaysia within the timeframe of 2018 to 2022, as recorded in the Scopus database. In the year 2018, the aggregate number of publications amounted to 175 papers, with a consistent upward trend observed in subsequent years. In the year 2019, there was an observed increase in the number of publications, specifically by 15 papers, reaching a total of 190, as compared to the preceding year, 2018. In a manner reminiscent of the previous year, 2020 witnessed the publication of a total of 196 papers, representing a modest increase of 6 papers compared to the previous year, 2019. In the year 2021, the publication exhibited a rise of 39 papers in comparison to the preceding year, 2020. In 2022, a notable increase in the number of publications by

Malaysian authors was observed, with a total of 262 papers. This figure represents the highest number of publications within a span of five years, surpassing the cumulative output from 2018 to 2021.

Table 2: Top 10 Malaysian authors in the Scopus database between 2018 and 2022

Authors	No of publication
Mohamad, Azhar	6
Fawehinmi, Olawole	4
Kamaruddin, S.	4
Nair, Harikrishna K.Ragavan	4
Hafaz, N. A.	4
Yusoff, Yusliza Mohd	4
Al-Dhamari, Redhwan Ahmed Ali	3
Amin, Hanudin	2
Amlus, Mohammad Harith	2
Ashraf, Amirul	2

Table 2 presents the data pertaining to the top 10 most productive authors in Malaysia, as extracted from the SCOPUS database for the period spanning from 2018 to 2022. The table has been arranged in descending order based on the authors' publication counts, ranging from the highest to the lowest. Mohamad Azhar, a researcher affiliated with the Malaysian Nuclear Agency, has demonstrated exceptional productivity in terms of scholarly output. Specifically, from 2018 to 2022, he has authored the highest number of publications, amounting to six papers. The second-highest number of publications consists of four papers authored by five individuals affiliated with different organisations. The individuals in question are Fawehinmi, Olawole, Kamaruddin S., Nair Harikrishna K. Ragavan, Hafaz N. A., and Yusoff Yusliza Mohd. The remaining four authors include Al-Dhamari, Redhwan Ahmed Ali, who have contributed to three papers. Additionally, Amin, Hanudin, Amlus, Mohammad Harith, and Ashraf, Amirul have each contributed to two papers, respectively. As active researchers, individuals have the capacity to generate positive societal impact through their work while concurrently enhancing their recognition and visibility within their respective academic domains.

Table 3: Top 10 active institutions in the Scopus database between 2018 and 2022

Institutions	No of publication
Universiti Malaya	79
Universiti Sains Malaysia	70
Universiti Kebangsaan Malaysia	59
Universiti Utara Malaysia	54
International Islamic University Malaysia	51
Universiti Putra Malaysia	49
Universiti Teknologi MARA	39
Universiti Teknologi Malaysia	26
Universiti Malaysia Terengganu	23
Taylor's University Malaysia	23

The top 10 active institutions that have published in the SCOPUS database are predominantly Malaysian Research Universities. Universiti Malaya has achieved a prominent position in the academic landscape, attaining the top rank in terms of scholarly publications from the years 2018 to 2022. A total of 79 publications have been attributed to the institution during this period, reflecting its commitment to research and knowledge dissemination. The subsequent institutions with the highest number of publications are Universiti Sains Malaysia with 70 publications, followed by Universiti Kebangsaan Malaysia with 59 publications, Universiti Utara Malaysia with 54 publications, International Islamic University Malaysia with 51 publications, and Universiti Putra Malaysia with 49 publications. Universiti Teknologi Malaysia (UTM) emerged as the institution with the lowest productivity in terms of research output within the SCOPUS database during the period spanning from 2018 to 2022. Specifically, UTM produced a total of 26 publications during this timeframe. Taylor's University Malaysia is a privately owned institution of higher education that has garnered recognition as one of the top 10 active establishments in terms of scholarly output, with a total of 23 publications.

The top 10 subject areas that published by Malaysian authors in Scopus database from 2018 and 2022 are listed in Table 4. Social Sciences discipline is in the first top 10 rank with 25% publications (364 papers) followed by Business, Management and Accounting (20%) or 301 papers. Economic, Econometrics and Finance, Medicine, Engineering and Arts and Humanities disciplines have publications in between 179 to 102 papers (12% to 7%). Other disciplines such as Computer Science, Environmental Science, Agricultural and Biological Sciences and Energy produced less than 100 publications for 5 years period from 2018 to 2022.

Table 4: Top 10 subjects in the Scopus database between 2018 and 2022

Subjects/Disciplines	No of publication
Social Sciences	364
Business, Management and Accounting	301
Economics, Econometrics and Finance	179
Medicine	139
Engineering	115
Arts and Humanities	102
Computer Science	93
Environmental Science	92
Agricultural and Biological Sciences	50
Energy	49

4   Conclusions

The abstract and tables provided in this study offer valuable insights into an investigation that examined the growth and trends of scientific research within higher education institutions in Malaysia. A wide range of publications in various fields support the findings, which show a growing involvement of Malaysian higher education institutions in scientific research. The authors and institutions that have been highlighted possess the potential to establish a strong basis for future research collaborations and partnerships. The recent increase in scientific research publications originating from Malaysia has notable implications for the reputation and economic standing of the country's institutions. Year 2022 shows the highest number of publications with 262 publications within 5 years of study. The pattern of publications also shows gradual increasing from year to year. This also shows a good sign of publication activities in terms of the quality and number of publications in SCOPUS database

For the most active authors within 5 years of study, author from non MRU is the most active authors in SCOPUS database. This indicates that active researchers are not from Malaysian higher education institutions or MRUs only, but also from other organizations that are active in research. From this study, the author from Malaysian Nuclear Agency is at the top rank of the most active researcher.

All the five MRUs are included in the top 10 rank institutions that actively published in SCOPUS database within 5 years from 2018 until 2022. University of Malaya, as the oldest university in Malaysia, has dominated the number of publications that produced by university's researchers. Taylor's University is the only private university that appear in the top ten rank and this indicates that this university is active in research publications compared to the other private universities. Scopus database covers many social sciences subjects or disciplines compared to Web of Science. In this study, the top three rank subjects are Social Sciences, Business, Management and Accounting and followed by Economics, Econometrics and Finance. This indicates that subject other than science and technology are among the subjects that widely published in SCOPUS indexed journals. From 2018 to 2022, subjects Social Sciences.

Business, Management and Accounting are in the top first and second rank from the top 10 rank. There is a quite big gap in terms of the number of publications between first and second top rank with the third rank and below.

Acknowledgments

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