e-ISSN: 2355-620X
DOI: 10.12928/jrkpf.v13i1.1800

Trends in islamic astronomy research: Bibliometric analysis of scopus publications

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Abstract
This study aims to provide a comprehensive overview of scientific research trends in the field of Islamic astronomy over the past two decades, namely from 2006 to 2025. To achieve this goal, the approach used is bibliometric analysis by utilizing publication data from the Scopus database. This study maps the extent to which the topic of Islamic astronomy has been studied, who the most active authors are, what journals contain the most related articles, and what keywords are often used in publications. Data were collected using keywords relevant to Islamic astronomy and filtered based on document type, language, and content relevance. Analysis was conducted using VOSviewer software to visualize the relationships between data, such as authors, institutions, keywords, and emerging themes. The results show that the trend of Islamic astronomy publications has increased significantly, especially in the last five years. Some journals and authors appear to be the most productive, such as the Archive for History of Exact Sciences and author Mozaffari. In terms of themes, Islamic astronomy research is divided into several clusters, ranging from philosophy of science, history of figures and manuscripts, to religious practices. In addition, there are also new trends such as the digitization of manuscripts and Islamic astronomy education that emerged after 2020. This study is expected to be an initial reference for novice researchers who want to explore Islamic astronomy and understand the direction and opportunities for future development of this topic.

Keywords: Bibliometrics, Islamic astronomy, Publication trends, Scopus, VOSviewer

Article submitted 2025-11-10. Revision uploaded 2026-04-06.
Accepted for publication 2026-04-06.
Available online on 2026-04-30.
https://doi.org/10.12928/jrkpf.v13i1.1800

I. Introduction

Astronomy is a branch of science that has developed since ancient times and plays an important role in human life, especially in understanding celestial phenomena and determining time [1], [2]. In Islamic history, astronomy occupies a very special position [3]. Since the golden age of Islamic civilization (around the 8th to 15th centuries), Muslim scientists have made significant contributions in this field, both in terms of observation, calculation, and the development of astronomical instruments such as the astrolabe and armillary sphere.

The Muslim community's need to determine prayer times, the direction of the qibla, and the Hijri calendar was one of the main factors in the development of astronomy in Islamic tradition [4], [5]. Names such as Al-Battani, Al-Sufi, Al-Zarqali, and Nasir al-Din al-Tusi are examples of Muslim scientists whose works are still recognized today and have even influenced the development of astronomy in Europe during the Renaissance.

The global impact of their works demonstrates the role of Islam as a bridge of knowledge in the history of astronomy.

Although the contributions of Islamic astronomy have been extensively studied in various history books and scientific journals, there have been few attempts to understand trends in Islamic astronomy research. Understanding of this topic has developed in contemporary scientific literature over the past 20–25 years. Currently, we do not know for certain how much attention scientists today pay to Islamic astronomy, which institutions or countries produce the most authors, and how research topics in this field have developed and transformed over time.

Therefore, a systematic approach is needed to map the development of research on Islamic astronomy. One method that can be used is bibliometric analysis, which is a quantitative approach used to analyze scientific publications based on metadata from indexed databases, such as Scopus. With this analysis, we can see the number of publications per year, the network of collaboration between researchers or countries, the journals that most frequently publish on this topic, and the keywords that appear most often.

This study aims to provide a comprehensive overview of trends in scientific publications related to Islamic astronomy using data from Scopus. It is hoped that the results of this analysis will provide insights to researchers, educators, and other parties interested in the study of Islamic science, as well as open up new avenues for future research. In addition, this bibliometric analysis is expected to map the direction of Islamic astronomy as a discipline. The findings of publication trends indicate that future research in Islamic astronomy will be dominated by the integration of technological sophistication and the resolution of Sharia controversies, particularly in producing more accurate and globally acceptable models for predicting the new moon.

II. Methods

In this study, the approach used is bibliometric analysis [6], [7], which is a technique for evaluating and describing research trends using data from scientific publications. This method is very useful for seeing how much research has been done on a topic, who the authors are, what journals are used, and what keywords appear most frequently [8], [9]. To perform this analysis, several steps were taken, as described below:

Data Sources

The data in this study were obtained from Scopus, one of the largest and most reliable scientific databases, which contains articles from international journals. Scopus was chosen because of its broad coverage and widespread use in bibliometric studies.

Search Process

The search was conducted using keywords relevant to Islamic astronomy. Several key keywords used in the search were: (“Islamic astronomy” OR “astronomy in Islam” OR “medieval Islamic astronomy” OR “Islamic science” AND “astronomy”). These keywords were typed into the Scopus search field with specific filters to ensure more accurate results.

Inclusion and Exclusion Criteria

The initial search yielded 578 articles. To ensure the results aligned with the research objectives, the following criteria were established: 1) Inclusion: Document types: journal articles, review articles, books, book chapters, and conference proceedings (561 documents remaining); Publication year: 2006 to 2025 (485 documents remained); and Language: English (392 documents remained). 2) Exclusion: Articles not directly related to astronomy in an Islamic context; documents lacking complete bibliometric data (e.g., without keywords or affiliations).

Data Export and Data Analysis

After the search was conducted and the results were filtered according to the criteria, the data were then exported in RIS format from Scopus. This data includes information such as: Article title, Author name, Author institution or affiliation, Keywords, Abstract, Journal name, Year of publication, and Number of citations. The collected bibliometric data is then analyzed using the VOSviewer software [10]. This tool is used to visualize the relationships between components in the data.

III. Results and discussion

Distribution of Annual Publications

The trend of Islamic astronomy publications over two decades (2006-2025) is shown in Figure 1.

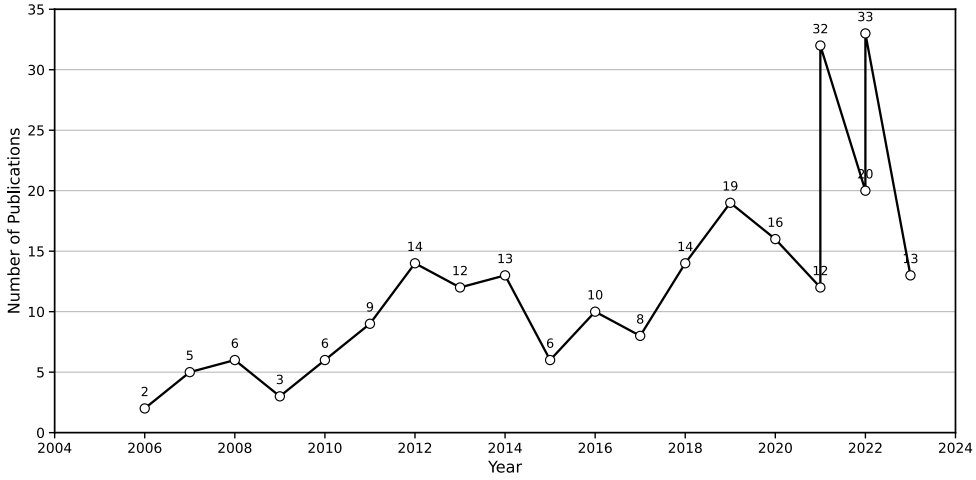

Figure 1. Trend graph of Islamic astronomy publications over two decades

As shown in Figure 1, publications on Islamic astronomy exhibit a fluctuating trend but have generally continued to increase during the 2006–2025 period, particularly in the last five years. The number of publications rose from just 2 articles (0.8%) in 2006 to 33 articles (13%) in 2024, the highest figure on record, indicating growing attention from the academic community toward this field [11], [12]. The most significant increase occurred during the 2021–2022 period, which is believed to be related to the wider adoption of modern astronomical technology as well as increased research on the visibility of the crescent moon and the unification of the Hijri calendar [13]–[17]. A decline in the number of publications during the 2022–2023 and 2024–2025 periods is also visually apparent. Overall, these findings suggest that Islamic astronomy is no longer studied solely as part of the historical legacy of Islamic scholarship but has evolved into an interdisciplinary field that integrates modern astronomy, technology, and Sharia studies [18]–[25].

Distribution Based on Source

The ten journals that published the most articles on Islamic Astronomy in the last two decades are presented in Table 1.

Table 1. Ten journals that published the most articles on Islamic Astronomy

No	Source title	N
1	Archive for History of Exact Sciences	14
2	Islamic History and Civilization	13
3	Routledge Handbook on the Sciences in Islamicate Societies Practices from the 2nd 8th to the 13th 19th Centuries	12
4	Journal for the History of Astronomy	12
5	Journal of Astronomical History and Heritage	8
6	Handbook of Archaeoastronomy and Ethnoastronomy	8
7	Journal of Physics Conference Series	7
8	Islamic Philosophy Theology and Science Texts and Studies	7
9	Transactions of the American Philosophical Society	6
10	Isis	6

Based on Table 1, four of the ten most productive source titles published more than ten articles on Islamic astronomy over two decades. The Archive for History of Exact Sciences had the most publications, followed by Islamic History and Civilization with 13 manuscripts. Meanwhile, the Routledge Handbook on the Sciences in Islamicate Societies Practices from the 2nd 8th to the 13th 19th Centuries and the Journal for the History of

Astronomy each had 12 titles. These four sources are consistent in publishing articles on Islamic astronomy and can be considered by future researchers for publishing scientific articles in the field of Islamic astronomy, as done by [23], [26]–[28].

The Archive for History of Exact Sciences journal, the most productive, published the most articles on Islamic Astronomy, with 14 articles (15.1%). The Archive for History of Exact Sciences journal is one of the journals indexed in the Scopus database since 1964, published by Springer. As of 2024, this journal has a Scimago Journal Rank (SJR) of 0.247. In the Arts and Humanities area, the Archive for History of Exact Sciences journal is ranked 74th out of 239 or in the 69th percentile (Q2). In the Mathematics area, the Archive for History of Exact Sciences journal is ranked 56th out of 109 or in the 49th percentile (Q3). In addition to being indexed in the Scopus database, the Archive for History of Exact Sciences journal is also indexed in the Web of Science (WoS) database with an impact factor (IF) of 0.7 in 2024 or 0.5 over the last 5 years. The Archive for History of Exact Sciences journal has a Hybrid publishing model with a bi-monthly publication frequency (6 issues per volume). The article written by Nothaft [29] has the highest number of citations among the 14 published articles on Islamic astronomy.

Most Productive Authors

The ten most productive authors on Islamic astronomy in the last two decades are shown in Figure 2.

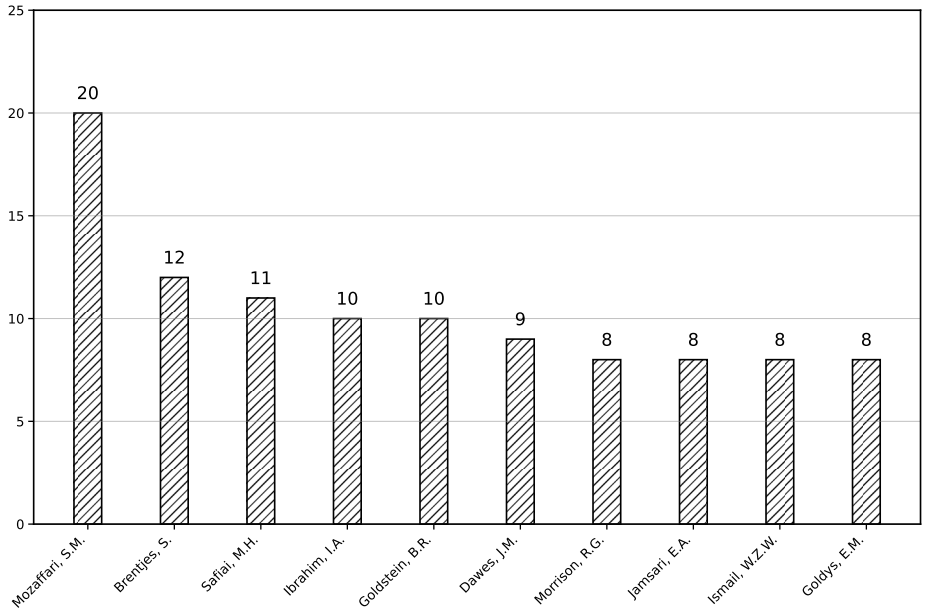

Figure 2. Ten prolific Islamic astronomers in two decades.

Based on Figure 2, three of the ten most productive authors (Mozaffari, Brentjes, and Safiai) have the highest number of publications in the last two decades. Mozaffari has published 20 articles (19.2%), while Brentjes and Safiai have published 12 articles (11.5%) and 11 articles (10.6%), respectively. Over the course of 13 years (2012-2024), they have published at least one article every year, except in 2021. Mozaffari was most productive in 2013 and 2016, publishing three articles in each of those years. Mozaffari is from the University of Maragheh, Maragheh, Iran. He has 15.8% international collaboration. Since 2009, Mozaffari has had 38 documents with an h-index of 8. The most cited article is titled "Muḥyī al-Dīn al-Maghribī's lunar measurements at the Maragha observatory." This article was published in the Archive for History of Exact Sciences in 2024 and has been cited 16 times. Although Brentjes is among the most prolific authors, with 12 documents. However, 50% of them were published in 2024. Meanwhile, from 2011 to 2013, he had no publications on the topic of Islamic astronomy. Brentjes is affiliated with The Science4Peace Forum. To date, he has 56 documents and an h-index of 10. The document with the most citations is titled "The sciences in Islamic societies (750-1800)" published in New Cambridge History of Islam Volume 4 Islamic Cultures and Societies to the End of the Eighteenth Century, pp. 564–639 in 2010.

These findings indicate that the development of research on Islamic astronomy remains dominated by a small number of authors who have consistently contributed over more than a decade. Mozaffari, Brentjes, and

Safiai can be categorized as core authors who play a crucial role in sustaining knowledge production in this field. The dominance of a few authors suggests that Islamic astronomy remains a relatively specialized field of study with a limited research community. Furthermore, the discrepancy between the number of publications and the h-index value suggests that productivity does not always align with the scientific impact of a work [30]–[32]. The low level of international collaboration also implies that the development of Islamic astronomy research still has the potential to be strengthened through broader global collaborative networks. International collaboration offers significant benefits in enhancing productivity, citations, visibility, scientific impact, and the quality of innovation, and contributes positively to an institution's innovation performance, with effects that can be sustained over the long term [33]–[36].

Keyword Analysis

The visualization of the Islamic astronomy keyword network is shown in Figure 3.

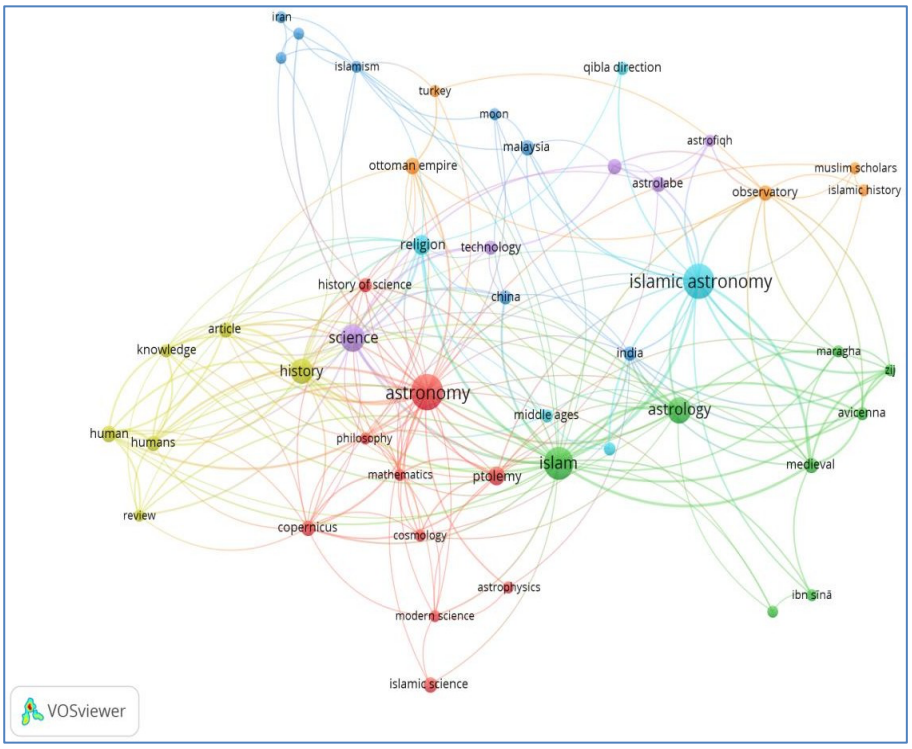

Figure 3. Results of the visualization of the Islamic astronomy keyword network

The keyword network visualization shows that research on Islamic astronomy has developed through seven interconnected thematic clusters, reflecting the multidisciplinary nature of this field. In general, the network structure reveals that the study of Islamic astronomy not only focuses on aspects of astronomy as a scientific discipline but also intersects with the history of science, philosophy, philology, Islamic studies, technology, and religious practices.

The largest clusters center on the keywords "Islamic science," "astronomy," "cosmology," "mathematics," "philosophy," and "history of science." The dominance of these clusters indicates that research on Islamic astronomy remains largely directed toward reconstructing the contributions of Muslim scientists to the development of classical astronomy and elucidating the role of astronomy within the Islamic intellectual tradition. The connections between keywords such as "Ptolemy," "Copernicus," and "Islamic science" show that Islamic astronomy is often positioned as a crucial link in the transmission of astronomical knowledge from Greek civilization to the development of modern science.

This historical theme is reinforced by the second cluster, which includes the keywords Avicenna, Ibn Sina, manuscripts, Maragha, and zij. This cluster highlights the significant academic interest in manuscripts, prominent Muslim astronomers, observatories, and classical astronomical instruments. The focus on manuscripts and medieval astronomical works indicates that philological and historical approaches remain the primary foundation for understanding the development of Islamic astronomy. This finding aligns with various

studies in the history of science that identify manuscripts as the primary source for reconstructing the development of scientific knowledge within Islamic civilization [37]–[40].

Beyond the historical dimension, the keyword network also reveals a broader scope of research through a third cluster encompassing the keywords China, India, Iran, Malaysia, modernity, and science and technology. This cluster indicates that research on Islamic astronomy is shifting from a focus on historical reconstruction toward studies of the dissemination, adaptation, and modernization of Islamic astronomy across various regions. The inclusion of several countries from the Asian region indicates that the development of Islamic astronomy is no longer understood solely within the context of the Middle East but has become part of the global dynamics of scientific and technological development.

Another notable dimension is the connection between Islamic astronomy and religious practice. This is reflected in the cluster containing the keywords "astrolabe," "astrofiqh," "qibla direction," "observatory," and "religion." This cluster indicates that Islamic astronomical research also developed through applied studies directly related to religious needs, such as determining the direction of the qibla, the Hijri calendar, and prayer times. Thus, Islamic astronomy developed not only as an intellectual and scientific tradition but also as an instrument serving practical functions in the socio-religious life of Muslim communities.

Further network analysis reveals that certain keywords occupy central positions and act as connectors between clusters, particularly "Islamic science" and "astrolabe." The central role of these two keywords indicates that Islamic astronomy developed in an interdisciplinary manner, involving various fields of knowledge, ranging from the history of science, philosophy, mathematics, philology, Islamic studies, to technology. These findings demonstrate that Islamic astronomy did not develop as a standalone discipline but rather as part of a broader scientific ecosystem within Islamic civilization.

Nevertheless, the results of the analysis indicate an imbalance in the distribution of research themes. Most keywords remain concentrated on historical aspects, classical figures, manuscripts, and traditional instruments. This pattern is consistent with various previous studies that report the dominance of historical and philological studies in Islamic astronomy research [18], [41], [42]. Conversely, themes related to Islamic astronomy education, digital technology, artificial intelligence, learning analytics, astronomical computing, and the integration of Islamic astronomy into STEM education remain relatively limited.

Interestingly, an analysis of keyword evolution reveals the emergence of new themes after 2020, particularly those related to manuscript digitization and Islamic astronomy education. The emergence of the manuscript digitization theme indicates a methodological shift from conventional philological approaches toward digital humanities approaches. On the other hand, the growing attention to Islamic astronomy education reflects efforts to integrate the Islamic intellectual heritage into modern science education [43], [44]. This development signals that research in Islamic astronomy is beginning to move from a paradigm of documentation and historical reconstruction toward a paradigm of knowledge transformation and educational dissemination.

However, the scarcity of topics such as artificial intelligence, computational astronomy, learning analytics, and STEM education indicates that this field still has vast room for development. This situation contrasts with the development of modern astronomy, which over the past decade has seen a significant increase in the use of digital technology, computational approaches, and data analytics. Therefore, the integration of Islamic astronomy with digital technology, science education, and other interdisciplinary approaches has the potential to become a promising direction for future research.

Overall, the intellectual framework of Islamic astronomy research remains dominated by three main themes: the history and philosophy of Islamic science, the manuscript tradition and prominent Muslim astronomers, and astronomical practices related to religious needs. Nevertheless, the emergence of new themes focused on digitization and education indicates a shift toward more contemporary studies. This development opens opportunities for future research to position Islamic astronomy not only as a subject of historical study but also as a source of inspiration for educational innovation, digital transformation, and the advancement of modern science.

Thematic Evolution

The visualization results are shown in Figure 4. Figure 4 shows the shift in the focus of Islamic astronomy research over the past two decades. The overlay visualization indicates that the themes of Islamic astronomy research underwent quite dynamic development during the 2016–2021 period. The color of each node represents the average year of keyword occurrence [45], where blue indicates earlier themes, while green

through yellow indicate newer themes that have emerged in recent years. This pattern allows for the identification of a shift in research focus from general historical themes toward more specific and contextual studies [46]–[48].

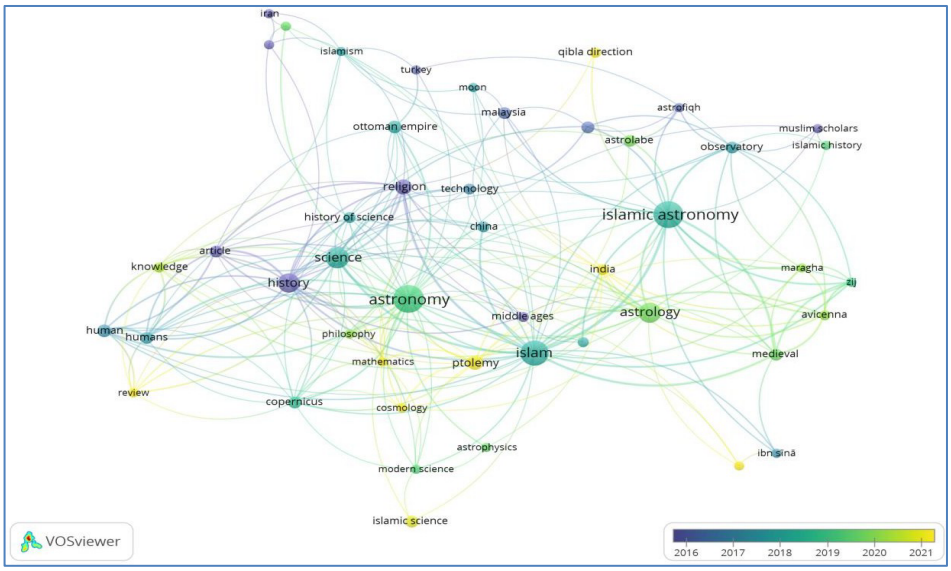

Figure 4. Results of Islamic astronomy overlay visualization

In the early phase, research on Islamic astronomy was dominated by themes related to the history of science and the reconstruction of the development of astronomy within Islamic civilization. This is evident from the dominance of keywords such as “history,” “history of science,” “article,” “review,” “knowledge,” “human,” and “humans,” which tend to be colored blue to purple. These findings indicate that research during this period was primarily aimed at documenting the development of Islamic astronomy, examining the contributions of Muslim scientists, and situating astronomy within the broader context of Islamic intellectual history.

As the next period began, the focus of research began to shift toward exploring the scientific and epistemological foundations of Islamic astronomy. Keywords such as astronomy, science, religion, technology, and Islam emerged as central nodes connecting various research clusters. The strategic position of these keywords indicates that Islamic astronomy began to be understood as a field not only related to history but also closely linked to the development of science, philosophy, mathematics, and religious practices. At this stage, research increasingly highlighted the relationship between the Islamic scientific tradition and the broader development of science.

Subsequent developments were marked by growing attention to the intellectual legacy and scientific contributions of Muslim astronomers. This is evident in the emergence of keywords such as Ptolemy, Copernicus, cosmology, mathematics, and philosophy. The presence of these keywords indicates a growing interest among researchers in examining the transmission of astronomical knowledge from the Greek tradition to the Islamic world, as well as the contributions of Muslim scientists to the global development of astronomy. Thus, research no longer focuses solely on historical descriptions but also on analyzing the intellectual connections between various scientific civilizations.

Newer themes, indicated by shades ranging from green to yellow, reveal a shift toward more specific areas of study. Keywords such as Avicenna, Maragha, zij, Islamic science, qibla direction, and astrofiqh have begun to receive greater attention in recent years. The emergence of these themes indicates a growing interest in the study of manuscripts, Islamic astronomical observatories, regional scholarly networks, and the application of astronomy in religious practice. In particular, the increased frequency of the keywords “qibla direction” and “astrofiqh” suggests that contemporary research is beginning to highlight the integration of astronomy and Islamic law in addressing the practical needs of Muslim communities.

The visualization also reveals the emergence of keywords associated with specific geographic regions, such as India, Malaysia, China, and Iran. This pattern indicates that research on Islamic astronomy is shifting from a perspective previously centered on the Middle East toward a more global approach. The focus on these

various regions reflects an effort to understand how Islamic astronomical knowledge has developed, adapted, and been transformed within different social and cultural contexts.

Interestingly, the term "Islamic astronomy" itself appears to be relatively newer compared to several other historical keywords. This finding suggests that the use of the term "Islamic astronomy" as an explicit identifier for this field of research has only recently gained attention in the Scopus literature. Prior to this period, research tended to use more general terms such as "astronomy," "science," "history of science," or "Islam." This suggests a process of conceptual consolidation, in which Islamic astronomy has gradually evolved from merely a part of the history of science to a research field that is increasingly recognized and possesses its own distinct academic identity.

Nevertheless, the analysis also reveals that research on topics related to digital technology, artificial intelligence, computational astronomy, Islamic astronomy education, and the integration of Islamic astronomy into STEM education remains relatively limited. In fact, the field of modern astronomy has experienced rapid development over the past decade through the use of digital technology and computational approaches. Therefore, these themes can be viewed as promising research opportunities for the future.

Overall, the thematic evolution of research on Islamic astronomy shows a shift from general historical studies toward more specific research on scientific heritage, manuscripts, astronomical institutions, regional scientific networks, and the application of astronomy in religious life. At the same time, there are emerging signs of a transformation toward a more contemporary approach through the use of digital technology and its integration into education. These developments indicate that Islamic astronomy has great potential to continue evolving as a field of study that is not only oriented toward historical reconstruction but also contributes to the advancement of modern science and education.

The density of research on specific keywords can be visualized in Figure 5.

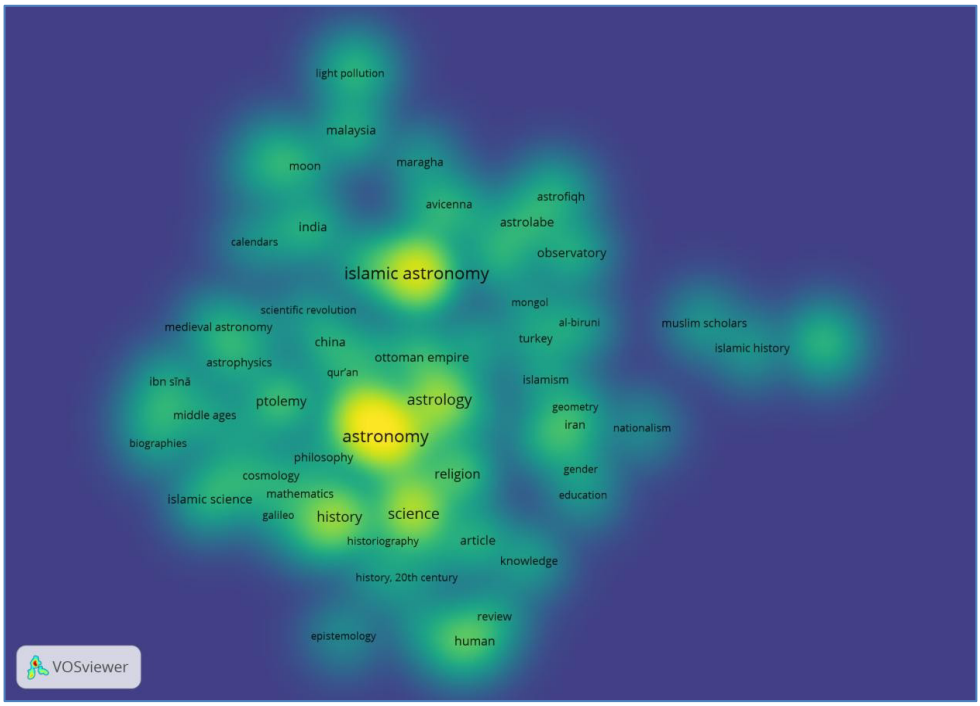

Figure 5. Visualization of research density on the topic of Islamic astronomy

Based on Figure 5, the density visualization shows the distribution of research intensity in the field of Islamic astronomy based on keyword frequency and connectivity. The brighter the color displayed, the higher the level of academic attention given to that topic [49], [50]. The visualization results show that the keywords "Islamic astronomy," "astronomy," "astrology," "science," and "history" are located in the area with the highest density, marked by a bright yellow color. These findings indicate that these topics form the core of the structure of Islamic astronomy research and are the primary focus of Scopus-indexed publications.

The highest density is observed for the keywords "Islamic astronomy" and "astronomy," which are located at the center of the network and surrounded by a number of interconnected keywords. This positioning suggests that the majority of research still focuses on discussing Islamic astronomy as a primary field of study,

both in the context of the historical development of astronomy and its contributions to science in general. The high density of the keywords "science" and "history" also indicates that research on Islamic astronomy remains heavily influenced by the history of science approach, which seeks to reconstruct the development of astronomical knowledge within Islamic civilization.

In addition to these core themes, several other keywords, such as religion, Islamic science, philosophy, mathematics, cosmology, and Ptolemy, exhibit moderate to high frequency. The presence of these keywords indicates that Islamic astronomy developed within a framework closely intertwined with philosophy, mathematics, and the Islamic intellectual tradition. This finding reinforces the view that Islamic astronomy was not studied merely as a discipline in its own right, but also as part of the history of the development of science and scientific thought in the Islamic world.

The density visualization also reveals significant attention to the study of figures and institutions in Islamic astronomy. Keywords such as Avicenna, Ibn Sina, Al-Biruni, Maragha, observatory, and Ottoman Empire appear in areas with medium density. This indicates that research on Muslim scientists, astronomical observatories, and centers of scientific development remains an important part of the literature on Islamic astronomy. The focus on these themes reflects academic efforts to understand the contributions of both individuals and institutions to the development of astronomy during the golden age of Islamic civilization.

From a geographical perspective, the emergence of keywords such as India, China, Malaysia, Iran, and Turkey indicates that Islamic astronomical research has expanded beyond the Middle East and is beginning to highlight the dynamics of astronomical development across various regions of the Islamic world. However, the frequency of these geographical keywords remains lower than that of historical and philosophical themes, suggesting that regional studies still serve as a supporting theme rather than the primary focus of research.

Interestingly, several keywords related to the application of astronomy in religious life, such as astrofiqh, astrolabe, moon, calendars, and religion, also exhibit a fairly high density. These findings suggest that research on Islamic astronomy is not only oriented toward historical and theoretical aspects but also encompasses practical applications related to determining the Hijri calendar, the start of the lunar month, the direction of the qibla, and other religious needs. Thus, the religious aspect remains one of the key characteristics that distinguishes research on Islamic astronomy from general astronomical studies.

On the other hand, several keywords, such as education, gender, nationalism, epistemology, light pollution, and knowledge, are located in areas of relatively low density. This low density indicates that these themes have not yet been extensively explored in the literature on Islamic astronomy. In particular, the lack of attention to the theme of education suggests that the integration of Islamic astronomy into science education remains a relatively new field of research. Similarly, the limited research on contemporary issues such as light pollution, gender, and epistemological approaches points to broad opportunities for future research development.

Overall, the density visualization confirms that research on Islamic astronomy is still dominated by themes related to the history of science, prominent Muslim astronomers, Islamic scientific traditions, and the relationship between astronomy and religion. Nevertheless, the emergence of several themes with low density indicates significant room for research diversification, particularly in the fields of Islamic astronomy education, modern astronomical technology, environmental studies, and interdisciplinary approaches that connect Islamic astronomy with contemporary issues. These findings suggest that the field of Islamic astronomy still holds significant potential to expand in broader directions and remain relevant to the challenges of modern science.

IV. Conclusions

This study aims to describe trends in scientific publications on Islamic astronomy over the past two decades by analyzing article metadata from the Scopus database from 2006 to 2025. The results of the analysis show that publications on Islamic astronomy have experienced a tendency to increase, albeit with fluctuations. The peak of publications occurred in 2024 with a total of 33 articles, reflecting an increase in interest in this topic in recent years. In terms of publication sources, articles on Islamic astronomy are mostly published in journals that focus on the history of science and classical Islamic studies. Keyword analysis shows that there are seven main clusters of Islamic astronomy research themes, ranging from the philosophy of science, classical figures and manuscripts, to religious practices and institutional developments. Thematic maps and overlay visualizations also show a shift in focus from classical figures to new themes such as manuscript digitization

and Islamic astronomy education. Keywords such as Islamic astronomy and qibla direction appear to have become increasingly relevant in recent years, opening up opportunities for further research exploration.

This study has several limitations that need to be acknowledged. First, the data analyzed only comes from the Scopus database, so publications that are only indexed in WoS, Google Scholar, or local databases are not included. This may cause a bias towards English-language publications and international journals, and potentially overlook the contributions of researchers from the Islamic world who publish in national journals. Second, the data for 2025 is still provisional because the publication process is ongoing. Therefore, the interpretation of the decline in publications this year must be done with caution. Third, this analysis is quantitative and does not explore the content or quality of the articles analyzed in depth. The bibliometric approach does not describe the richness of the content or the substantive impact of each publication. Based on the results of this study, it is recommended that future research expand its data sources by not only relying on Scopus, but also involving other databases such as Web of Science, Google Scholar, and local indexes so that the literature coverage is more representative, including from researchers in the Islamic world. In addition, a content analysis approach to important articles needs to be carried out to understand the conceptual and thematic contributions in greater depth. Future research could also explore the dynamics of international collaboration and the integration of Islamic astronomy in the context of modern science education and literacy. Focusing on new themes such as the digitization of manuscripts and the development of astronomy in the Islamic curriculum also presents important opportunities for further study.

References

[1] L. Jaeger and M. Dacorogna, "Astronomical Research," in *Where Is Science Leading Us?*, Cham: Springer Nature Switzerland, 2023, pp. 259–278. doi: 10.1007/978-3-031-47138-4_12.

[2] L. Taub, "Astronomy in Its Contexts," in *The Cambridge Companion to Ancient Greek and Roman Science*, Cambridge University Press, 2020, pp. 208–228. doi: 10.1017/9781316136096.011.

[3] M. I. Aziz and A. Musta'id, "Islamic Astronomy of Abbasid Era (750-1258 AD)," *J. Islam. Hist. Manuscr.*, vol. 1, no. 1, pp. 35–52, Jun. 2022, doi: 10.24090/jihm.v1i1.5944.

[4] A. Anwar, B. Bukhari, and A. Mardika, "Bridging Law and Astronomy: The Influence of Astronomy on Islamic Law," *Astroislamica J. Islam. Astron.*, vol. 3, no. 2, pp. 156–170, Dec. 2024, doi: 10.47766/astroislamica.v3i2.3646.

[5] E. Sururi and A. Laili, "Penentuan Awal Waktu Sholat Sebagai Syarat Sah Sholat," *Fakta Forum Aktual Ahwal Al-Syakhsiyah*, vol. 1, no. 2, pp. 37–40, Aug. 2023, doi: 10.28926/fakta.v1i2.1344.

[6] Z. Zainuddin, M. Misbah, M. Mastuang, Q. Qamariah, M. Z. Bin Amiruddin, and N. F. A. Rahman, "Mapping a Decade of Research on Artificial Intelligence and Augmented Reality in Physics Education: A Bibliometric Analysis (2016–2025)," *Online Learn. Educ. Res.*, vol. 5, no. 2, pp. 537–557, Dec. 2025, doi: 10.58524/oler.v5i2.901.

[7] M. Z. Abidin, S. I. Ahmad, and N. D. A. Majid, "Bibliometric analysis of global research trends on the risks of hydrogen in Scopus database," 2025, p. 020037. doi: 10.1063/5.0212508.

[8] C. M. Darie, "The Link between Business Benefits and ERP Systems: A Bibliometric Analysis," *Proc. Int. Conf. Bus. Excell.*, vol. 17, no. 1, pp. 1957–1966, Jul. 2023, doi: 10.2478/picbe-2023-0172.

[9] A. Kumari, R. Nagina, M. Paruthi, and H. Das Gupta, "A Bibliometric Analysis of Sustainability Literature: Benefits, Implications and Future Trends," in *Securing the Future through Sustainability, Health, Education, and Technology*, London: Routledge, 2024, pp. 1–22. doi: 10.1201/9781003587200-1.

[10] W. Q. de F. Cavalcante, A. Coelho, and C. M. Bairrada, "Sustainability and Tourism Marketing: A Bibliometric Analysis of Publications between 1997 and 2020 Using VOSviewer Software," *Sustainability*, vol. 13, no. 9, p. 4987, Apr. 2021, doi: 10.3390/su13094987.

[11] I. A. Ibrahim, M. R. Ahmad, M. H. Safiai, and W. K. Mujani, "Islamic astronomy and the establishment of Al-Khawarizmi complex in Malaysia," *Adv. Nat. Appl. Sci.*, vol. 6, no. 3, pp. 316–320, 2012, [Online]. Available: https://www.scopus.com/inward/record.uri?eid=2-s2.0-84860861221&partnerID=40&md5=cbb9bdd5999e715b153d2bac9189e92d

[12] I. A. Ibrahim *et al.*, "Observatories in Malaysia: Descendants of islamic civilization superiority," *Int. J. Civ. Eng. Technol.*, vol. 8, no. 12, pp. 782–795, 2017, [Online]. Available: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85040708494&partnerID=40&md5=4772bac5021cbd86f64d17b3b0022595

[13] M. Fleer, *The Role of Imagination in STEM Concept Formation*. BRILL, 2022. doi: 10.1163/9789004520066.

[14] M. Americo, "Theory as an Inclusive Pedagogical Tool: Postcolonial Theory and the Greco-Arabic Translation Movement in Today's Ancient History Classrooms," *Class. World*, vol. 115, no. 3, pp. 291–318, Mar. 2022, doi: 10.1353/clw.2022.0011.

[15] N. F. Ngadiman, N. N. M. Shariff, and Z. S. Hamidi, "Zenithal Sky Brightness Measurement at Selangor Observatory," *J. Phys. Conf. Ser.*, vol. 1768, no. 1, p. 012015, Jan. 2021, doi: 10.1088/1742-6596/1768/1/012015.

[16] M. Maskufa, S. Sopa, S. Hidayati, and A. Damanhuri, "Implementation of the New MABIMS Crescent Visibility

Criteria: Efforts to Unite the Hijriyah Calendar in the Southeast Asian Region," *AHKAM J. Ilmu Syariah*, vol. 22, no. 1, Jun. 2022, doi: 10.15408/ajis.v22i1.22275.
[17] M. Marwadi, "Renewing the Thoughts of the Hijri Calendar of Muhammadiyah, Nahdlatul Ulama and Persatuan Islam and Its Implications for Realization of National Hijri Calendar," *Al-Manahij J. Kaji. Huk. Islam*, vol. 15, no. 1, pp. 19–36, Jun. 2021, doi: 10.24090/mnh.v15i1.4870.
[18] M. S. Faid, M. S. A. M. N., M. H. Mohd Saadon, N. Ahmad, and A. Ali @ Mat Zin, "Islamic Historical Review on Middle Age Lunar Crescent Visibility Criterion," *J. Al-Tamaddun*, vol. 17, no. 1, pp. 109–125, Jun. 2022, doi: 10.22452/JAT.vol17no1.9.
[19] G. Van Brummelen, *The Doctrine of Triangles: A History of Modern Trigonometry*. Canada: Princeton University Press, 2021, [Online]. Available: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85133028090&partnerID=40&md5=0f293d1aee059853edf6c42ef0bb71a2
[20] J. M. Determann, *Islam, Science Fiction and Extraterrestrial Life*. I.B. Tauris, 2021. doi: 10.5040/9780755601288.
[21] M. Mehfooz and A. S. Syed, "The Development of Science and Technology in the Muslim World: Past and Present Issues with Possible Resolutions," *Islam. Stud.*, vol. 59, no. 2, pp. 225–238, 2020, [Online]. Available: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85150384600&partnerID=40&md5=4808e39a672f1bdc24d9b6af10e603f6
[22] F. Ozcep, "Physical earth and its sciences in Istanbul: a journey from pre-modern (Islamic) to modern times," *Hist. Geo. Space Sci.*, vol. 11, no. 2, pp. 173–198, Aug. 2020, doi: 10.5194/hgss-11-173-2020.
[23] G. Zotti and S. M. Mozaffari, "New Light on the Main Instrument of the Samarqand Observatory," *J. Hist. Astron.*, vol. 51, no. 3, pp. 255–271, Aug. 2020, doi: 10.1177/0021828620943986.
[24] A. M. Mulyadi, "Taklif of Lunar and Solar Eclipse Prayers According to Fiqh and Scientific Perspective," *AL-IHKAM J. Huk. Pranata Sos.*, vol. 14, no. 1, pp. 27–49, Jun. 2019, doi: 10.19105/al-lhkam.v14i1.1862.
[25] S. M. Mozaffari, "The Orbital Elements of Venus in Medieval Islamic Astronomy: Interaction Between Traditions and the Accuracy of Observations," *J. Hist. Astron.*, vol. 50, no. 1, pp. 46–81, Feb. 2019, doi: 10.1177/0021828618808877.
[26] S. M. Mozaffari, "Ibn al-Zarqālluh's discovery of the annual equation of the Moon," *Arch. Hist. Exact Sci.*, vol. 78, no. 3, pp. 271–304, May 2024, doi: 10.1007/s00407-023-00323-z.
[27] S. Brentjes, "Teaching Mathematical and Astronomical Knowledge in Classical and Post-Classical Islamicate Societies," in *Knowledge and Education in Classical Islam: Religious Learning between Continuity and Change (2 vols)*, BRILL, 2020, pp. 610–634. doi: 10.1163/9789004413214_028.
[28] Y. Isahaya, "Islamicate Astral Sciences in Eastern Eurasia During the Mongol-Yuan Dynasty (1271–1368)1," in *Routledge Handbook on the Sciences in Islamicate Societies*, London: Routledge, 2023, pp. 688–695. doi: 10.4324/9781315170718-61.
[29] C. P. E. Nothaft, "Criticism of trepidation models and advocacy of uniform precession in medieval Latin astronomy," *Arch. Hist. Exact Sci.*, vol. 71, no. 3, pp. 211–244, May 2017, doi: 10.1007/s00407-016-0184-1.
[30] P. Kamrani, I. Dorsch, and W. G. Stock, "Do researchers know what the h-index is? And how do they estimate its importance?," *Scientometrics*, vol. 126, no. 7, pp. 5489–5508, Jul. 2021, doi: 10.1007/s11192-021-03968-1.
[31] H. P. Singh, "Alternative research bibliometrics: It's about quality and not quantity," *Shoulder Elb.*, vol. 14, no. 2, pp. 121–122, Apr. 2022, doi: 10.1177/17585732211058453.
[32] H. H. Bi, "Four problems of the h-index for assessing the research productivity and impact of individual authors," *Scientometrics*, vol. 128, no. 5, pp. 2677–2691, May 2023, doi: 10.1007/s11192-022-04323-8.
[33] S. R. Mirnezami and C. Beaudry, "Does Experiencing International Research Collaboration Permanently Affect the Impact of Scientific Production? Evidence from Africa," *J. Afr. Econ.*, vol. 31, no. 3, pp. 251–271, May 2022, doi: 10.1093/jae/ejab008.
[34] J. Dua, V. K. Singh, and H. H. Lathabai, "Measuring and characterizing international collaboration patterns in Indian scientific research," *Scientometrics*, vol. 128, no. 9, pp. 5081–5116, Sep. 2023, doi: 10.1007/s11192-023-04794-3.
[35] Z. Zhong, G. Zheng, and Y. Wang, "Impact of Transnational Research Collaboration on Universities' Innovation Performance: Panel Data Research of 64 Chinese Universities from 2009 to 2019," *Sustainability*, vol. 15, no. 1, p. 83, Dec. 2022, doi: 10.3390/su15010083.
[36] X. Fu, X. (Maggie) Fu, P. Ghauri, and J. Hou, "International collaboration and innovation: Evidence from a leading Chinese multinational enterprise," *J. World Bus.*, vol. 57, no. 4, p. 101329, Jun. 2022, doi: 10.1016/j.jwb.2022.101329.
[37] A. Bardi, "Islamic Astronomy in Fifteenth-Century Christian Environments: Cardinal Bessarion and His Library," *J. Islam. Stud.*, vol. 30, no. 3, pp. 338–366, Sep. 2019, doi: 10.1093/jis/etz013.
[38] K. Kusdiyana, S. Samsudin, M. Buchori, and R. M. Syam, "A Comparative Study of Islamic Astronomy and Jurisprudence on the Qibla Direction of Historical Mosques in Cirebon Indonesia," *J. Ilm. Mizani Wacana Hukum, Ekon. Dan Keagamaan*, vol. 11, no. 2, p. 450, Oct. 2024, doi: 10.29300/mzn.v11i2.4902.
[39] E. A. Rojak and R. Fawzi, "The Normative Basis of Islamic Astronomy For The Transformation of Prayer Schedules To Digital And Its Accuracy," *El-Usrah J. Huk. Kel.*, vol. 7, no. 2, p. 602, Dec. 2024, doi: 10.22373/ujhk.v7i2.22097.
[40] D. A. King, *Islamic Astronomy and Geography*. Taylor and Francis, 2022. [Online]. Available:

https://www.scopus.com/pages/publications/85143921950
[41] F. Jamil Ragep, "Mathematics, the mathematical sciences, and historical contingency: Some thoughts on reading Netz," *Interdiscip. Sci. Rev.*, vol. 47, no. 3–4, pp. 464–477, Oct. 2022, doi: 10.1080/03080188.2022.2108963.
[42] Y. Mahdavi, "Abū Saʿīd Al-Siǧzī And The 'Structure Of The Orbs,' The Earliest Known Work On Hayʾa," *Arab. Sci. Philos.*, vol. 31, no. 1, pp. 45–94, Mar. 2021, doi: 10.1017/S0957423920000089.
[43] W. Hidayat and T. Ibrahim, "Implementing of Science-Social Integration in Islamic Education Learning," *J. Pendidik. Islam*, vol. 7, no. 1, pp. 1–16, Jun. 2021, doi: 10.15575/jpi.v7i1.12515.
[44] M. A. Ma`arif, M. H. Rofiq, and A. Sirojuddin, "Implementing Learning Strategies for Moderate Islamic Religious Education in Islamic Higher Education," *J. Pendidik. Islam*, vol. 8, no. 1, pp. 75–86, Jun. 2022, doi: 10.15575/jpi.v8i1.19037.
[45] U. A. Bukar, M. S. Sayeed, O. A. Amodu, S. F. A. Razak, S. Yogarayan, and M. Othman, "Leveraging VOSviewer approach for mapping, visualisation, and interpretation of crisis data for disaster management and decision-making," *Int. J. Inf. Manag. Data Insights*, vol. 5, no. 1, p. 100314, Jun. 2025, doi: 10.1016/j.jjimei.2024.100314.
[46] Y. Gao, S. L. Wong, M. N. M. Khambari, N. bt Noordin, and J. Geng, "Sustaining E-Learning Studies in Higher Education: An Examination of Scientific Productions in Scopus between 2019 and 2021," *Sustainability*, vol. 14, no. 21, p. 14005, Oct. 2022, doi: 10.3390/su142114005.
[47] Z. Allam, A. Sharifi, D. Giurco, and S. A. Sharpe, "On the Theoretical Conceptualisations, Knowledge Structures and Trends of Green New Deals," *Sustainability*, vol. 13, no. 22, p. 12529, Nov. 2021, doi: 10.3390/su132212529.
[48] H. Omrany, R. Chang, V. Soebarto, Y. Zhang, A. Ghaffarianhoseini, and J. Zuo, "A bibliometric review of net zero energy building research 1995–2022," *Energy Build.*, vol. 262, p. 111996, May 2022, doi: 10.1016/j.enbuild.2022.111996.
[49] Syed M. Afraz Hassan Gillani, Aslan Bin Amat Senin, Jürgen Bode, Muniba, and Syed M. Ahmad Hassan Gillani, "Bibliometric Analysis of Digital Entrepreneurial Education and Student Intention; Reviewed and Analyzed by VOSViewer from Google Scholar," *Int. J. Interact. Mob. Technol.*, vol. 16, no. 13, pp. 48–65, Jul. 2022, doi: 10.3991/ijim.v16i13.30619.
[50] M. N. Amin, W. Ahmad, K. Khan, and M. M. Sayed, "Mapping Research Knowledge on Rice Husk Ash Application in Concrete: A Scientometric Review," *Materials (Basel).*, vol. 15, no. 10, p. 3431, May 2022, doi: 10.3390/ma15103431.