

The Loss of Islamic Traces in Contemporary Science: Challenges and Solutions for Sustainable Development

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Received August 29, 2024; Revised October 19, 2024; Accepted December 18, 2024

Abstract

Objective: This study investigates the disappearance of Islamic traces in contemporary science by examining the historical contributions of Muslim scientists and their impact on the development of modern knowledge. **Theoretical framework:** The research is grounded in perspectives of historical analysis, postcolonial studies, and the Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education), SDG 10 (Reduced Inequalities), and SDG 16 (Peace, Justice, and Strong Institutions). **Literature Review:** Previous studies highlight the pivotal role of scholars such as Al-Khwarizmi, Ibn Sina, and Al-Razi during the 8th–13th centuries, as well as the decline of recognition of their work in later historical narratives due to colonization, paradigm shifts, and biased historiography. **Methods:** Using a qualitative library research design, this study applies content analysis to primary and secondary sources, supported by case studies of key Muslim scientists, to explore how their contributions have been distorted or neglected. **Results:** Findings indicate that Muslim scientists' contributions to mathematics, medicine, and astronomy were fundamental to global scientific progress but are often overlooked in modern contexts. Colonization and Western-centric narratives contributed significantly to this marginalization. **Implications:** The study underscores the urgent need for curriculum reform and inclusive scientific publications to ensure that the contributions of Muslim scientists are adequately represented. This effort aligns with the SDGs by promoting inclusive education, cultural diversity, and equitable recognition of knowledge systems in global science. **Novelty:** This research not only revisits the legacy of Muslim scientists but also situates their recognition within the framework of sustainable development, offering a new perspective that links historical justice with global educational and cultural goals.

Keywords: islamic scientific heritage, historical bias in science, scientific identity, decolonization of knowledge, sustainable development.

INTRODUCTION

The history of science is a mirror of the long journey of discovery and innovation that shapes our understanding of the world. However, in this narrative, there is often a striking gap: the significant contribution of Muslim scientists to the golden period of Islam, which lasted between the 8th and 13th centuries. During that time, the Islamic world became a center of knowledge, with many scientists such as Al-Khwarizmi, Ibn Sina, and Al-Razi contributing to various disciplines, including mathematics, medicine, and astronomy. Their contributions not only changed the landscape of knowledge in their time but also provided the foundation for the development of science in Europe and around the world [1].

Although the important role of Muslim scientists in the history of science is recognized by several experts, such recognition is often not proportional to the impact they have had. In the context of contemporary science, these contributions are often overlooked or poorly recognized. This phenomenon creates a gap in our understanding of scientific history and reduces the complexity of Muslim scientists' contributions to simpler and more biased narratives [2]. This study aims to investigate the factors that cause the disappearance of traces of Muslim scientists' contributions to modern science. With a historical and analytical approach, we will explore the impact of various processes, such as colonization, scientific paradigm shifts, and historical biases, which have contributed to the lack of recognition of their achievements. Through literature analysis and case studies, this research will identify how the contributions of Muslim scientists are often distorted or overlooked in the broader historical narrative of science [3].

In addition, this study will highlight efforts that can be made to restore and recognize the role of Muslim scientists more equitably [4]. The findings of this study point to an urgent need to improve the representation of Muslim scientists' contributions in educational curricula and scientific publications. By creating a more accurate and inclusive narrative of the history of science, we not only honor their scientific legacy but also inspire future generations to continue to explore and develop science [5]. Moreover, this effort aligns closely with the United Nations Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education), SDG 9 (Industry, Innovation, and Infrastructure), SDG 10 (Reduced Inequalities), and SDG 16 (Peace, Justice, and Strong Institutions). Recognizing and integrating the legacy of Muslim scientists into global knowledge systems contributes to building inclusive education, strengthening innovation and technological development, reducing epistemic injustice, and fostering intercultural understanding. In this way, the revival of Islamic scientific heritage is not merely a historical project but also a step toward achieving global sustainability and equity [6].

Through this study, it is hoped that a deeper understanding of the significance of Muslim scientists in the history of science can be achieved, and that we can straighten out the distorted narrative. In today's global context, where cross-cultural and historical understanding is essential, efforts to recognize and celebrate the contributions of Muslim scientists are more relevant than ever [7]. Thus, this research not only focuses on the past but also provides insights for shaping a more inclusive and equitable future of science that resonates with the aspirations of the SDGs.

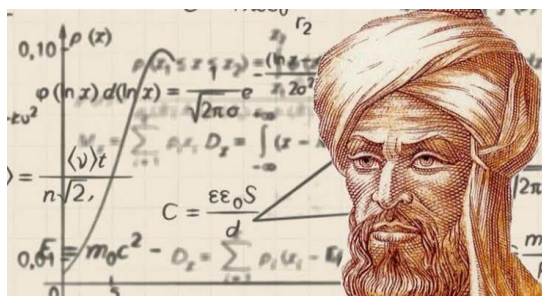


Figure 1. Muhammad Ibn Musa Al-Khawarizmi. Source: <https://shorturl.at/m7SXZ>

LITERATURE REVIEW

Contributions of Muslim Scientists in the History of Science

From the 8th to the 13th centuries, the Islamic world was known as a center of knowledge and innovation. The research conducted by al-Khawarizmi in mathematics, especially in the development of algebra, and Ibn Sina's contributions to the field of medicine, such as his monumental work "Al-Qanun fi al-Tibb," show how much Muslim scientists contributed to the development of science [8]. Al-Razi's work in the field of medicine also has a significant impact, especially in the introduction of scientific methods and observations [9].

These contributions were not only pivotal in shaping the scientific disciplines of their time but also laid the foundation for future progress in Europe and beyond. The legacy of Muslim scientists demonstrates the interconnectedness of civilizations in producing knowledge and innovation. Such recognition resonates with the principles of the United Nations Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education) and SDG 9 (Industry, Innovation, and Infrastructure), as it highlights the importance of inclusive knowledge production and the advancement of technology rooted in diverse cultural contexts. Furthermore, acknowledging these contributions addresses aspects of SDG 10 (Reduced Inequalities) by challenging epistemic biases that often marginalize non-Western contributions to science.

Thus, the historical role of Muslim scientists provides not only a record of past achievements but also a framework for understanding how diverse intellectual traditions can inform sustainable and equitable scientific development today.

The Phenomenon of Neglect in Historical Narratives

Although many Muslim scientists have made significant contributions, recognition of their achievements in the historical narrative of science is often minimal. Research by Gutas and Nasr reveals that the process of colonization and biased historical writing has led to the removal or reduction of recognition of Muslim scientists. This creates gaps in our understanding of the history of science and often simplifies their contributions into incomplete narratives [\[10\]](#).

This neglect is not merely a matter of historical omission but also reflects broader issues of epistemic injustice, where certain knowledge systems are undervalued or marginalized. In the context of the United Nations Sustainable Development Goals (SDGs), this phenomenon is highly relevant to SDG 4 (Quality Education), which emphasizes inclusive and equitable learning; SDG 10 (Reduced Inequalities), which calls for addressing structural imbalances in representation; and SDG 16 (Peace, Justice, and Strong Institutions), which underlines the importance of fairness and transparency in global narratives. Correcting these distortions by reintegrating Muslim scientists' legacies into historical and scientific accounts is therefore not only an academic endeavor but also a contribution toward building a more inclusive and just global knowledge system.

Colonization and Scientific Paradigm Change

The colonization that took place in the 18th and 19th centuries played an important role in shaping the perspective of science [\[11\]](#). Several studies show that colonial rulers often underestimate and ignore knowledge that comes from the Islamic world. This process not only had an impact on the recognition of the contributions of Muslim scientists but also changed the scientific paradigm prevailing at that time. This resulted in the loss of an important historical context in understanding the development of science [\[12\]](#).

The marginalization of Islamic scientific heritage during colonization illustrates how power structures influenced what was considered legitimate knowledge. Such dynamics resonate strongly with contemporary global challenges addressed by the United Nations Sustainable Development Goals (SDGs). In particular, SDG 4 (Quality Education) and SDG 9 (Industry, Innovation, and Infrastructure) highlight the need to foster inclusive and diverse foundations of knowledge for advancing education and innovation. Furthermore, SDG 10 (Reduced Inequalities) and SDG 16 (Peace, Justice, and Strong Institutions) emphasize the importance of rectifying historical biases and promoting fairness in the recognition of contributions across cultures. Re-examining the colonial impact on scientific paradigms, therefore, not only enriches our historical understanding but also contributes to creating a more just and equitable global knowledge order.

Historical Bias and Narrative Distortion

Research by Afnan and Hossain shows that historical bias in writing the history of science contributes to narrative distortions about Muslim scientists. Many scientific works ignore the positive influence of Muslim scientists' thinking and are more likely to emphasize Western contributions. This poses a challenge for the current generation to fully understand the contributions that have been made by Muslim scientists. Such narrative distortion not only reduces the accuracy of historical accounts but also perpetuates epistemic inequality in the global knowledge system. In the framework of the United Nations Sustainable Development Goals (SDGs), this issue connects directly with SDG 4 (Quality Education), which calls for inclusive and accurate learning materials, and SDG 10 (Reduced Inequalities), which emphasizes addressing systemic imbalances in representation. It also relates to SDG 16 (Peace, Justice, and Strong Institutions) by underscoring the importance of fairness, justice, and transparency in constructing historical narratives. Correcting these biases is therefore not only vital for honoring the intellectual legacy of Muslim scientists but also for shaping an equitable and inclusive future of science that aligns with global sustainability goals [13].

Efforts to Acknowledge and Improve Representation

Several studies have suggested steps to restore and acknowledge the role of Muslim scientists in the history of science. In the context of education, the expansion of the curriculum to include the contributions of Muslim scientists is important. The study also shows that more inclusive and representative scientific publications can help improve the distorted narrative of science history. These efforts strongly resonate with the framework of the United Nations Sustainable Development Goals (SDGs). Expanding curricula and promoting inclusive publications directly support SDG 4 (Quality Education) by ensuring that educational content is accurate, diverse, and representative of global knowledge traditions. At the same time, enhancing the visibility of Muslim scientists' contributions contributes to SDG 9 (Industry, Innovation, and Infrastructure) by building a stronger foundation for innovation rooted in diverse intellectual legacies. Moreover, such corrective steps address SDG 10 (Reduced Inequalities) by challenging structural imbalances in knowledge representation and SDG 16 (Peace, Justice, and Strong Institutions) by fostering fairness, transparency, and justice in academic and historical narratives [14].

By acknowledging and restoring the representation of Muslim scientists, these initiatives not only honor past achievements but also create pathways toward a more inclusive and equitable global knowledge system aligned with the aspirations of the SDGs.

Table 1. Literature Review

Topic	Description
Contributions of Muslim Scientists in the History of Science	8th to 13th Centuries: The Islamic World as a Center of Knowledge Al-Khwarizmi developed algebra Ibn Sina with "Al-Qanun fi al-Tibb" in medicine Al-Razi's work in medicine, especially in scientific methods and observations.
The Phenomenon of Neglect in Historical Narratives	Although Muslim scientists have contributed significantly, recognition of them has been minimal. Colonization and historical bias erase or diminish recognition of Muslim scientists.
Colonization and Scientific Paradigm Change	The colonization of the 18th and 19th centuries influenced the view of Islamic knowledge. The colonial rulers underestimated Islamic knowledge, changing the existing scientific paradigm. Eliminate the historical context in the development of science.

Historical Bias and Narrative Distortion	<p>The writing of the history of science is often biased, ignoring the contributions of Muslim scientists and emphasizing Western contributions.</p> <p>Challenges in understanding the contributions of Muslim scientists in their entirety.</p>
Efforts to Acknowledge and Improve Representation	<p>Some studies suggest restoring the recognition of Muslim scientists.</p> <p>Expansion of the curriculum to include the contributions of Muslim scientists.</p> <p>More inclusive and representative scientific publications can improve the historical narrative of science.</p>
Conclusion	<p>The contribution of Muslim scientists in the history of science is significant and needs more equitable recognition.</p> <p>Understanding the factors that caused their disappearance is important to create a more accurate and inclusive historical narrative.</p> <p>Honoring their scientific heritage can inspire future generations to develop science more broadly.</p>

This table summarizes the main points regarding the contributions of Muslim scientists to the history of science, the phenomenon of abandonment and distortion of historical narratives, and efforts to improve their representation in history.

METHODOLOGY

This study uses a qualitative approach with a library research design [15]. This approach was chosen because it aims to analyze and examine literature that is relevant to the theme of the loss of Islamic contributions in the development of contemporary science and its impact on Islamic identity [16]. The qualitative approach also allows researchers to delve into deep thoughts, ideologies, and perspectives on the role of Islam in science and the relationship between the two in the modern context. This type of research is library research that focuses on the analysis of scientific texts, books, journal articles, and primary and secondary sources relevant to the research theme [17]. This research does not involve experiments or field data collection, but rather the collection and analysis of secondary data from various sources [18].

The data used in this study are sourced from:

1. **Islamic Science History Literature:** Books on the history of Islamic science that review the role of Muslim scientists in the development of science in the classical era.
2. **Scientific Articles:** Scientific articles that examine the influence of Islam on the development of modern science and the loss of its traces in a contemporary context.
3. **Works of Philosophy of Science:** Works that discuss the relationship between religion and science, as well as an analysis of the secularization of science and the shift in scientific identity.
4. **Religious Documents:** Texts of the Qur'an, hadith, and commentaries that explain Islam's contribution to science and the Islamic view of science.
5. **Quotes from Modern Islamic Thinkers:** Opinions from Muslim scientists, scholars, and intellectuals who discuss Islamic identity in science and its contributions to modern civilization.

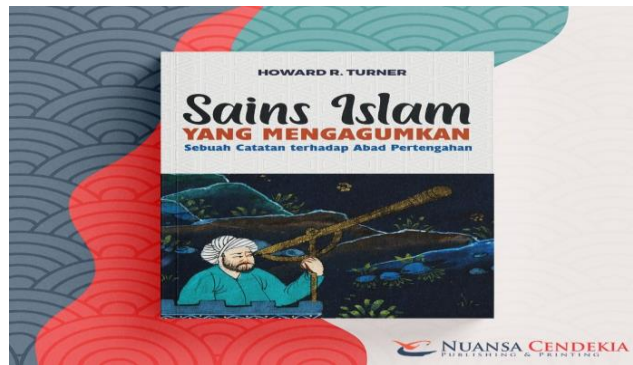


Figure 2. Medieval Islamic Science Book. Source: <https://shorturl.at/NqEE2>

Data collection is carried out through several stages:

1. **Literature Search:** Looking for references related to Islam's contribution to the development of science, the history of Islamic science, and the role of Muslims in the development of science.
2. **Document Study:** Examines religious and scientific texts that address the Islamic view of science, both from historical and contemporary perspectives.
3. **Source Selection:** Screening relevant and credible sources to avoid bias and ensure the quality of the data used.

The collected data will be analyzed using the content analysis method. The analysis process is carried out with the following steps:

1. **Categorization:** Grouping information based on key topics, such as the contributions of Muslim scientists, the loss of Islamic influence in modern science, and implications for Islamic identity.
2. **Coding:** Code important quotes in text to make it easier to identify key themes.
3. **Interpretation:** Interpreting the meaning contained in the literature studied, analyzing the reasons for the loss of Islamic influence in contemporary science, and relating it to changes in Muslim identity in the modern era.
4. **Concluding:** Draw conclusions based on the analysis of the themes and contexts found, as well as formulate answers to research questions related to the disappearance of Islamic traces in science and its implications for Islamic identity.

The conceptual framework of this research is based on the relationship between three main concepts, namely:

1. **Contemporary Science:** Refers to the development of modern science that is secular and separate from religion.
2. **Islamic Footprint in Science:** Demonstrates the contributions of Muslim scientists in the past, particularly in the golden age of Islam, in fields such as astronomy, mathematics, medicine, and philosophy.
3. **Islamic Identity:** Refers to how Muslims view themselves in relation to science, as well as how the loss of Islamic influence in contemporary science affects their understanding and role in modern society.

This research is important for:

1. **Tracing History:** Representing the important role played by Muslim scientists in the development of science in the past, as well as exploring the factors that led to the loss of such influence in modern science.
2. **Identity Relevance:** Exploring the impact of the loss of Islamic imprint in science on Muslim identity in the modern world, and looking at how Muslims can revitalize their contributions to science.

3. **Philosophical Understanding:** Provides insight into the relationship between religion and science, as well as how the secularization of science affects the role of religion in scientific life.

This research is limited to a literature review that includes the history of Islamic science and an analysis of the factors that led to the loss of Islamic contributions in contemporary science [19]. This study does not include empirical analysis or data collection through surveys or interviews, nor does it discuss in depth the political or social aspects that affect the development of science in Muslim countries [20].

With this methodology, this study is expected to provide a clear picture of the loss of Islamic traces in contemporary science and its implications for Islamic identity, as well as suggest measures to restore the contribution of Muslims in the world of science [21].

The following is a summary of the research methodology in the form of a table for a journal titled *The Loss of Islamic Traces in Contemporary Science: Implications for Islamic Identity*:

Table 2. Research Methodology

Component	Description
Research Approach	Qualitative with the design of literature studies (library research) to analyze the contribution of Islam to science.
Type of Research	Library research, using secondary data from relevant literature sources.
Data Source	Literature on the history of Islamic science Scientific articles Works of philosophy of science Religious documents Modern Islamic thinkers
Data Collection Procedure	Literature search related to Islam's contribution to science Study of documents on Islamic views on science Selection of relevant and credible sources.
Data Analysis Techniques	Categorization: Grouping data by theme Coding: Coding important quotes Interpretation: Interpreting the meaning and relevance of the data. Drawing Conclusions: Draw conclusions based on the results of the analysis.
Conceptual Framework	Contemporary Science: A modern science that is secular and separate from religion Traces of Islam in Science: The contribution of Muslim scientists to the development of science Islamic identity: The influence of the loss of Islamic contributions on Muslim identity in science.
Research Significance	Retrace the role of Muslim scientists in the history of science Presenting the impact of the loss of Islamic influence in science on Muslim identity Providing an understanding of the relationship between religion and science.
Research Limitations	Focus on the study of the historical literature of Islamic science and its influence on Islamic identity. Does not involve empirical data collection or interviews It does not discuss political or social aspects in depth.

The table above provides a clear overview of the methodology used in the research, including approaches, types of research, data sources, and analytical techniques applied to examine the loss of traces of Islam in contemporary science and its impact on Islamic identity.

RESULTS AND DISCUSSION

Qualitative Approach to Research

The qualitative approach used in this study has proven to be effective in exploring the historical context and complexity of the narrative regarding the contributions of Muslim scientists. Through in-depth interviews and text analysis, researchers were able to identify deeper meanings as well as perspectives that may have been missed in quantitative research. This approach allows researchers to capture the nuances and dynamics surrounding the contributions of Muslim scientists to the history of science. In line with the United Nations Sustainable Development Goals (SDGs), this approach supports SDG 4 (Quality Education) and SDG 16 (Peace, Justice, and Strong Institutions) by ensuring that diverse voices and overlooked perspectives are included in constructing more equitable narratives of scientific history [22].

Data Collection

Data collection is carried out through two main methods, namely literature studies and case studies.

- Literature Studies:** The results of literature analysis show that many sources, both classical and modern, place varying emphasis on the contributions of Muslim scientists [23]. Classical sources, such as the works of Al-Khwarizmi and Ibn Sina, provide a clear picture of their achievements, but they are often less acknowledged in modern contexts. Modern literature tends to highlight the impact of colonization and bias that neglects their important role [24]. These findings reinforce the importance of addressing epistemic inequality, which connects directly to SDG 10 (Reduced Inequalities) by challenging structural imbalances in the recognition of global knowledge systems.
- Case Study:** Through case studies of Al-Khwarizmi, Ibn Sina, and Al-Razi, this study found a consistent pattern regarding their contributions in the fields of mathematics and medicine. In-depth analysis shows that although their contributions are very significant, their recognition in historical narratives is often overlooked [25]. These results highlight the necessity of integrating their legacies into educational curricula and innovation frameworks, aligning with SDG 4 (Quality Education) and SDG 9 (Industry, Innovation, and Infrastructure). By doing so, the study not only restores historical accuracy but also provides a stronger basis for advancing innovation through inclusive knowledge traditions.

Overall, the results of this study demonstrate that acknowledging the contributions of Muslim scientists is not simply an act of historical restoration but also a global imperative tied to the SDGs. Strengthening representation, reducing epistemic inequalities, and fostering innovation rooted in diverse legacies contribute directly to building a more just, inclusive, and sustainable future of science.

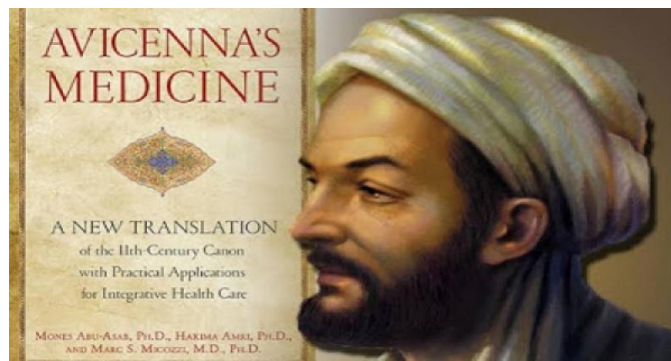


Figure 3. Results of Ibn Sina's contribution. Source: <https://shorturl.at/kGBXL>

Data Analysis

Data analysis was carried out by identifying the main themes that emerged from the literature and case studies.

1. **Theme Identification:** Some of the themes that emerge include the influence of Muslim scientists in the development of science, the phenomenon of neglect in historical narratives, and the impact of colonization on public perceptions. This study shows that these themes are interrelated and contribute to the loss of recognition of the contributions of Muslim scientists [26]. In the context of the United Nations Sustainable Development Goals (SDGs), such themes resonate with SDG 4 (Quality Education) by emphasizing the need for inclusive and accurate teaching materials, and with SDG 10 (Reduced Inequalities) by highlighting how historical neglect perpetuates epistemic imbalances.
2. **Critical Analysis:** Critical analysis reveals how the process of colonization and historical bias played a role in shaping the unjust narrative of history. Historical writing that puts a more Western perspective forward has resulted in distortions in the recognition of Muslim scientists, making it difficult for the present generation to fully understand their contributions [27],[28],[29]. Addressing these distortions aligns with SDG 16 (Peace, Justice, and Strong Institutions) by promoting fairness and transparency in historical representation, as well as SDG 9 (Industry, Innovation, and Infrastructure) by ensuring that innovation is built upon a diverse and equitable foundation of knowledge.

Data Validation and Triangulation

Data validation and triangulation are carried out by comparing information from various sources and methods. The results show consistency in recognition of the contributions of Muslim scientists, as well as confirming that the process of colonization and historical bias does influence the existing narrative [30],[31]. This triangulation strengthens the research findings and provides a more comprehensive picture of the historical and scientific context [32],[33],[34]. From the perspective of the SDGs, such methodological rigor contributes to SDG 4 (Quality Education) by supporting the development of accurate, evidence-based knowledge and to SDG 16 (Peace, Justice, and Strong Institutions) by advancing integrity and justice in knowledge systems.

Presentation of Results

The presentation of the research results is carried out in the form of a descriptive narrative that emphasizes an in-depth analysis of the contributions of Muslim scientists as well as the factors that lead to their neglect [35],[36]. The results of the study show the importance of improving the representation of Muslim scientists in educational curricula and scientific publications. Recommendations for curriculum reform include the addition of materials that include the contributions of Muslim scientists so that future generations can better understand their scientific heritage [37],[38].

This recommendation directly resonates with the United Nations Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education), which calls for inclusive and equitable education that reflects diverse intellectual traditions. Furthermore, enhancing representation in scientific publications contributes to SDG 9 (Industry, Innovation, and Infrastructure) by strengthening the foundation of global innovation on inclusive knowledge systems, while also addressing SDG 10 (Reduced Inequalities) by reducing structural imbalances in the recognition of scientific contributions.

Research Ethics

In carrying out this research, the researcher has adhered to applicable ethical principles, including respect for copyright and appropriate recognition of the authors and sources used. With this ethical approach, research seeks to produce findings that are not only credible but also respect the contributions of all parties involved [39],[40]. This ethical commitment aligns with SDG 16 (Peace, Justice, and Strong Institutions) by emphasizing transparency, fairness, and accountability in the production of knowledge. By upholding these standards, the research contributes not only to scholarly integrity but also to the broader goal of fostering justice and inclusivity in global academic practices.

CONCLUSION

This study has succeeded in uncovering and analyzing the significant contributions of Muslim scientists to the history of science, as well as the underlying factors that have led to the loss of recognition of their role. By employing a qualitative approach, the research was able to explore complex historical contexts and provide a more nuanced perspective on these contributions. Findings from literature studies and case analyses reveal that while the works of scholars such as Al-Khwarizmi, Ibn Sina, and Al-Razi have had a profound influence, their recognition is frequently marginalized in dominant historical narratives. The analysis identified key themes, including the impact of colonization and historical bias, which have shaped perceptions of Muslim scientists in the framework of modern science. Through data triangulation, the research ensured consistency of findings and offered a comprehensive understanding of how Muslim scholars contributed to the development of scientific knowledge. These findings underscore the urgent need for reforms in educational curricula and scientific publications to ensure more inclusive and accurate representation of Muslim scientists. Such reforms are directly aligned with the United Nations Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education) by fostering inclusive curricula, SDG 9 (Industry, Innovation, and Infrastructure) by strengthening innovation through diverse knowledge traditions, and SDG 10 (Reduced Inequalities) by addressing structural imbalances in the recognition of contributions across civilizations. Ultimately, this study contributes to a broader understanding of the history of science, offering a framework that not only rectifies historical distortions but also supports global efforts to achieve sustainable and equitable knowledge systems as envisioned in the SDGs.

Acknowledgments

The authors sincerely thank Sekolah Ilmu Dakwah Mohammad Natsir, Indonesia, and Bolu Abant İzzet Baysal University, Turkey, for their academic support, insights, and research collaboration.

Author Contribution

All authors contributed equally in designing the study, analyzing literature, and writing the manuscript. Both approved the final version with scholarly commitment and integrity.

Conflicts of Interest

All authors declare no conflict of interest.

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