E-Learning Integration of *Tasawuf* in Islamic Education: A Bibliometric Study

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ABSTRACT

Keywords:
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This bibliometric study investigates the scholarly landscape surrounding the integration of Sufism (*Tasawuf*) and moral education within the context of Islamic pedagogy, particularly through the utilization of e-learning methods. The study aims to provide insights into the evolution and trends in research on this interdisciplinary topic. Therefore, the significance of Sufism and moral values in Islamic education is well-established, and the adoption of e-learning as a tool to facilitate their integration has garnered increasing attention in recent years. This study seeks to identify the key themes, research gaps, and influential publications in this emerging field. In this paper, a comprehensive search was conducted using Scopus, focusing on articles between 2020 and 2023. Keywords such as e-learning, Sufism, *Tasawuf*, morals, teaching Islamic, and Islamic education were employed to identify relevant literature. Bibliometric analysis was conducted to examine publication trends, influential authors, and the thematic focus of the research. The study approach employs bibliometric techniques to map the intellectual landscape of research at the intersection of e-learning, Sufism, and moral education in Islamic contexts. This approach provides a quantitative understanding of the current state of scholarship in this domain. In conclusion, preliminary findings reveal a growing body of research on integrating e-learning, Sufism, and moral education in Islamic contexts, with a significant increase in publications in recent years. The study identifies key research themes, prominent authors, and influential journals, shedding light on the evolving dynamics of this interdisciplinary field.

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1. Introduction

E-learning has become an integral part of education, including Islamic education, allowing individuals to access knowledge and teachings remotely. In the context of Islamic education, the teachings of Sufism, also known as *Tasawuf*, play a significant role in shaping the moral and ethical development of individuals. Sufism emphasizes the inner dimension of Islam, focusing on self-discipline, humility, and contemplation [1-4]. It is deeply rooted in the teachings of prominent figures such as al-Makkī, al-Qushayrī, Ibn al-ʿArabī, Rūmī, and others, who have contributed to defining the virtues and characteristics of Sufism [5]. In addition, the application of Sufism, particularly in the discipline of *Tasawuf*, aims to achieve recognition of Allah and enhance faith and piety, which are fundamental aspects of the Islamic creed [6]. Furthermore, Sufism is considered a pure teaching originating from Islamic principles, rooted in the Quran and the hadith of Prophet Muhammad SAW [7]. In the realm of Islamic education, the cultivation of *Akhlaq* (morals and ethics) holds great importance. Islamic education aims to enhance the faith, understanding, and practice of individuals towards the religion of Islam, emphasizing the development of piety and moderation[8,9]. Additionally, the teachings of Islamic education are intended to manage Islamic educational institutions effectively, involving various human resources to achieve its goals[10,11].

Moreover, the concept of Islamizing science, as advocated by Syed Muhammad Naquib al-Attas, is relevant to Islamic education, addressing the split in science attributed to the West's secularization [12]. The historical context of Islamic education is also significant, as it sheds light on Islam's struggle to establish educational institutions. Indigenous people historically received education through Islamic education and teaching centers and institutions founded by Christian missionaries, reflecting the diverse educational landscape influenced by Islam and Christianity [13]. Furthermore, traditional forms of Islamic education, such as *pesantren* and *surau*, have been instrumental in preserving and transmitting Islamic knowledge, including teachings on *Akhlaq*, within the context of modernization in Indonesia [14].

Hence, the integration of Sufism, the emphasis on *Akhlaq*, the management of Islamic education, and the historical context of Islamic educational institutions collectively contribute to the rich tapestry of Islamic education. Accordingly, these elements play a crucial role in shaping individuals' moral, ethical, and intellectual development within the Islamic educational framework. The paper is structured as follows: Section 2 provides an in-depth review of the research literature. Section 3 outlines the research question. Methodology is elaborated upon in Section 4, while Section 5 presents the results and findings. Finally, Section 6 is dedicated to the discussion and conclusion of the paper.

2. Literature Review

The rapid evolution of e-learning has drawn considerable attention in recent years, driven by technological progress and its capacity to overcome geographical limitations [11,13-14]. Simultaneously, Islamic education, deeply rooted in long-standing traditions, has evolved to meet modern challenges, including the incorporation of technology in teaching methods [15,16]. This review of literature examines the interplay between e-learning and Islamic concepts such as Sufism, *Tasawuf*, and *Akhlaq*, as well as the dissemination of Islamic values in education, utilizing bibliometric analysis from Scopus [17-19]. The rise of e-learning has catalyzed significant transformations in Islamic education, with institutions globally expanding their offerings of Islamic courses and programs via online platforms, thereby broadening access to knowledge for a worldwide audience [16,17].

Sufism, Islam's mystical and spiritual facet, focuses on the path to self-refinement and divine proximity. *Tasawuf*, its practical manifestation, centers on personal inner growth. The integration of these concepts into e-learning environments enables students to delve into spirituality, self-discovery, and transcendence within digital spaces. The teachings of renowned scholars like Ibn al-ʿArabī, Rūmī, and Al-Ghazali continue to guide educators and students in this field [22-24]. Moreover, Islamic doctrine emphasizes *Akhlaq* (ethics) and the nurturing of moral principles. Online platforms for Islamic education incorporate *Akhlaq* as a fundamental element, emphasizing character formation, integrity, empathy, and compassion. The inclusion of moral values in digital curricula aims to cultivate well-rounded individuals capable of navigating contemporary complexities while adhering to Islamic ethical standards[21,22].

The instruction of Islamic values through e-learning employs a diverse strategy. Educators utilize multimedia content, interactive dialogues, and practical case studies to impart Islamic principles such as fairness, tolerance, and social duty. This method promotes a more profound comprehension of how Islamic tenets can be applied in modern scenarios [27-29]. While the fusion of Sufism, *Tasawuf*, *Akhlaq*, and Islamic value instruction with e-learning offers potential for enhanced spiritual growth, it also presents hurdles. These challenges include verifying the authenticity of digital content, fostering a sense of community and spirituality in virtual learning environments, and bridging the digital divide in access to Islamic education [30-33].

The synthesis of e-learning with Sufism, *Tasawuf*, *Akhlaq*, and Islamic value instruction will be subject to a bibliometric systematic analysis. To maximize the benefits of this integration, educators and institutions must persistently tackle associated challenges while harnessing technological advancements to deliver a holistic and genuine Islamic educational experience.

2. Methodology

Bibliometrics means the combination, managing, and investigation of bibliographic information obtained from publications that are scientific in nature [36]. It includes general descriptive statistics, such as publishing journals, publication year, and main author classification [37]. Furthermore, it also comprises complex techniques, such as document co-citation analysis. An iterative sequence of suitable keywords, literature search, and analysis are required for an effective review of literature, bibliography building, and achieving reliable results, respectively [38]. Hence, the study attempted to restrict to top-tier publications as they may assist in understanding the theoretical perspective regarding the evolution of the research domain. For the reasons mentioned earlier, the study depended on the Thomas ISI Scopus database for data collection [33,34]. Furthermore, to guarantee the inclusion of top-tier publications, only articles published in carefully peer-reviewed and high-quality academic journals were considered to the exclusion of books and conference proceedings [41].

Elsevier's Scopus has a strong coverage from 2020 to December 2023, which was explored for analysis. The most widespread overage of citation and bibliographic records in social science and humanities are included in Clarivate Analytics' Web Of Science (WoS) Core Collection and was, therefore, implemented for retrieval of articles in the present study [40-41]. In this study, bibliometrics encompasses the collection, organization, and analysis of bibliographic data sourced from scientific publications [36]. This involves basic descriptive statistics such as journal publication, publication year, and primary author categorization [38] and more intricate techniques like document co-citation analysis. To conduct a robust literature review, build a comprehensive bibliography, and attain reliable outcomes, it is essential to follow an iterative process involving the selection of appropriate keywords, literature searches, and meticulous analysis [38].

This study focuses on top-tier publications, as they offer valuable insights into the evolution of the research domain from a theoretical perspective. To ensure the inclusion of high-quality publications, the study relies on the Thomas ISI Scopus database for data collection [39]. Moreover, the study exclusively considers articles published in rigorously peer-reviewed and reputable academic journals, excluding books and conference proceedings [41]. The analysis in this study is based on Elsevier's Scopus database, which offers extensive coverage from 2020 to December 2023. Additionally, for articles in the social sciences and humanities, known for their widespread citation and bibliographic records is employed to ensure comprehensive retrieval [40-41].

3.1. Data Search Strategy

Table 1
The search strings

Scopus	TITLE-ABS-KEY ("e- learning" OR Sufism OR *Tasawuf** OR *Akhlaq* OR "islamic teaching" OR "islamic education") AND PUBYEAR > 2019 AND PUBYEAR < 2024 AND (LIMIT-TO (SUBJAREA, "COMP") OR LIMIT-TO (SUBJAREA, "SOCI")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (OA, "publisherhybridgold"))

Table 2
The selection criterion is searching

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	2020 – 2023	< 2020
Literature type	Journal (Article)	Conference, Book, Review
Publication Stage	Final	In Press

3.2 Data Analysis

Datasets, comprising information such as publication year, publication title, author names, journal, citations, and keywords in PlainText format, were acquired from the Scopus database, covering the time span from 2020 to December 2023. These datasets underwent analysis and the creation of visual maps using VOSviewer software version 1.6.19. VOS clustering and mapping techniques were applied within this software for this purpose. It is crucial to note that VOSviewer offers an alternative approach to the Multidimensional Scaling (MDS) method [44]. Indeed, both VOSviewer and MDS share a common goal, aiming to position items in a low-dimensional space that accurately reflects their relatedness and similarity. This involves ensuring that the distance between two items in the visual representation corresponds closely to the degree of relatedness or similarity between those items. Essentially, both VOSviewer and MDS work toward achieving this fundamental objective in data visualization and analysis [45]. Unlike MDS, which primarily focuses on the calculation of similarity measures like Jaccard indexes and cosine similarity, VOSviewer implements a more appropriate technique for normalizing co-occurrence frequencies [46].

The software was employed to conduct an analytical assessment and generate visual representations through the utilization of VOS clustering and mapping methodologies. VOSViewer offers an alternative to the MDS technique originally presented by [47]. Its primary objective mirrors that of MDS, which is to position elements within a reduced-dimensional space to accurately reflect their interrelatedness and similarity, as elucidated by Appio *et al.* in their work from 2014. Nevertheless, unlike MDS, which concentrates on the computation of similarity indices such as

Jaccard indexes and cosine measures, VOSViewer adopts a more appropriate approach for standardizing co-occurrence frequencies, as detailed by Van Eck and Waltman in their research from 2007, such as the association strength, which is calculated as:

$$AS_{ij} = C_{ij} / (W_i W_j).$$

This measure is "proportional to the ratio between the observed number of co-occurrences of i and j and the expected number of co-occurrences of i and j under the assumption that co-occurrences of i and j are statistically independent" [47]. Utilizing this index, VOSviewer positions items on a map by reducing the weighted sum of squared distances between all item pairs. According to [48], the LinLog/modularity normalization method was implemented. Furthermore, by applying visualization techniques through VOSviewer to the dataset, patterns built on mathematical relationships were uncovered, and analyses such as keyword co-occurrence, citation analysis, and co-citation analysis were performed. The development of research areas during a specific period can be explored through keyword co-occurrence analysis [49], which is successful in identifying popular topics in different fields [50]. On the other hand, citation analysis is useful in identifying key research issues, trends, and techniques, along with exploring the historical relevance of a discipline's main area of focus [51]. Document co-citation analysis is one of the frequently applied bibliometric methods [38], [41], [48], and its results depend on network theory to identify the relevant structure of data [41].

4. Results
4.1 What are the Research Trends in E-Learning in Tasawwuf Islamic Education According to the Year of Publication

The trends through the data presented in Figure 1, which takes us on a compelling narrative of the evolution of e-learning in the *Tasawuf* aspect of Islamic Education from the pivotal year of 2020 to the promising horizon of 2023. As we cast our gaze upon the figure, it immediately becomes evident that we are witnessing an undeniable upward trajectory. The ascending line on the graph is akin to the heartbeat of a rapidly growing interest in this specialized field. The question that naturally arises is, "What has fueled this remarkable ascent?" One cannot discuss the surge in e-learning publications without acknowledging the profound impact of the COVID-19 pandemic. In the year 2020, as the world grappled with the unforeseen challenges of the pandemic, educational institutions discovered themselves compelled to adapt. Moreover, the sudden shift to e-learning was not limited to mainstream education but reached deep into specialized domains such as *Tasawuf* education. The urgency of the situation prompted educators to embark on an exploration of e-learning solutions, thus marking the initial surge in publications for that year.
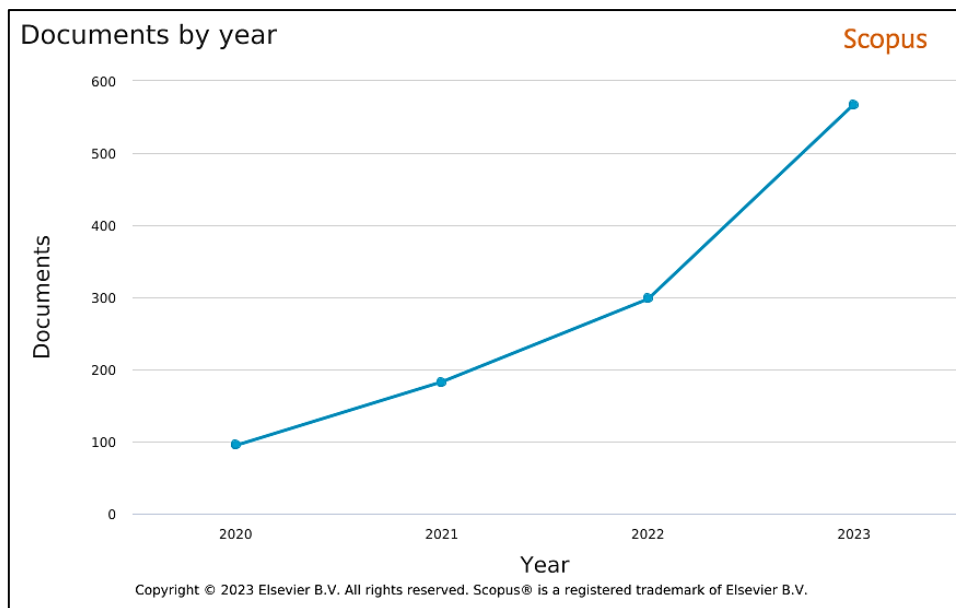
Fig. 1. The trends of e-learning in Tasawwuf aspect of Islamic education to the year of publication

Moving forward to 2021, the upward trend persists, indicating that the journey has transcended mere necessity and has ventured into the realm of possibility. This year could be characterized as a period of discovery, where researchers began unearthing the potential of e-learning in the unique landscape of *Tasawuf* education. It suggests that the initial findings and explorations were encouraging, sparking a continued surge in interest. Furthermore, the year 2022 ushers in a deeper phase of research and development. The further increase in publications hints at a commitment to refining e-learning methods tailored specifically for *Tasawuf*. This phase may have seen the birth of innovative instructional approaches and, potentially, the initiation of pilot implementations to evaluate these novel concepts in practice.

Moreover, we find ourselves in the year 2023, with the graph continuing its upward climb. This persistent rise signals a growing confidence in e-learning as the mode of choice for delivering *Tasawuf* education. Researchers are not only publishing their findings but also disseminating their knowledge widely. In addition, it is conceivable that early evaluations of the implemented solutions are underway, providing valuable insights into the effectiveness of e-learning in this context. Beyond the trends and figures, there is another question that piques our curiosity: "Who contributes the most to this expanding body of knowledge?" Who are the authors behind these documents that chart the course of e-learning in *Tasawuf* Islamic Education? The answer to this question lies within the data, and it beckons us to explore further to uncover the individuals whose dedication and expertise are shaping the future of this field.

4.2 Who Writes the Most Documents by Author?

Figure 2 describes the bar chart that appears to represent the number of documents authored by various researchers in the field of e-learning within the context of *Tasawuf* Islamic education, as indexed by the Scopus database. Such bibliometric analyses are crucial for understanding the research landscape, identifying key contributors, and evaluating the impact of different scholars in a specific academic field. Additionally, the chart indicates a diverse range of contributions from various authors, with one author notably leading in the number of documents authored. This suggests that

the leading author may be a pivotal figure within this niche field, potentially driving the research agenda or contributing significantly to the body of knowledge.
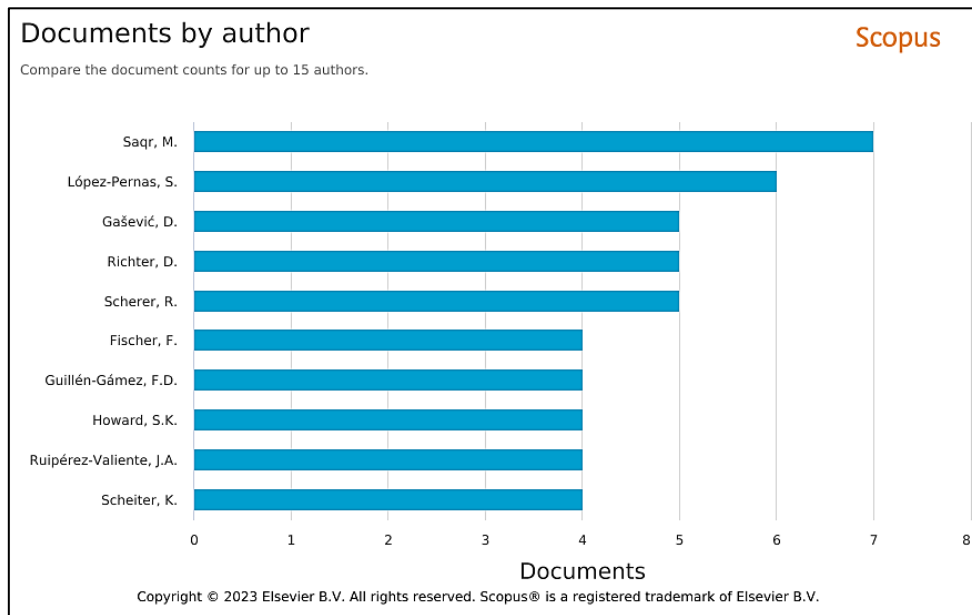

Fig. 2. The most written document by the author

In bibliometric analysis, the number of documents authored can be a useful metric; however, it is also essential to consider the quality and impact of these documents. Metrics such as citations, h-index, and journal impact factors can provide a more nuanced view of an author's influence and the significance of their work within the scholarly community. Furthermore, the presence of multiple authors with varying numbers of documents also points to a collaborative and dynamic field, with a healthy mix of established scholars and possibly emerging researchers. This variety is essential, as it indicates ongoing research activity and a breadth of perspectives being explored in the study of e-learning and *Tasawuf* Islamic education.

It would be beneficial to delve deeper into the content of these documents to identify common themes, research methods, and theoretical frameworks. Are these authors focusing on pedagogical strategies, technological integration, or perhaps the philosophical underpinnings of e-learning in the context of *Tasawuf*? Such an examination could reveal trends over time and highlight the evolution of research priorities. Additionally, it is interesting to note the international and interdisciplinary nature of research in this field. Authors from different regions may bring unique cultural and philosophical insights, enriching the discourse and potentially leading to more culturally responsive e-learning solutions within *Tasawuf* Islamic education. In this article, consider discussing not only the quantity of contributions by each author but also their qualitative impact. Examine their collaborative networks, the reception of their work within the academic community, and the practical implications of their research. Accordingly, this comprehensive approach will provide a more complete picture of the state of e-learning research in *Tasawuf* Islamic education and will be invaluable to other researchers, practitioners, and policymakers interested in this field.

4.3 What are the Most Subject Areas?

According to Figure 3, the pie chart provided by the Scopus database offers a visual representation of the distribution of documents across various subject areas related to e-learning in *Tasawuf* Islamic education. This bibliometric analysis is instrumental in understanding how different

disciplines contribute to the body of knowledge in this specialized area of study. Furthermore, the chart demonstrates that Computer Science and Social Sciences are the most significant contributors to this field, with 32.2% and 29.7% of the documents, respectively. The prominence of Computer Science underscores the integral role technology plays in the development and delivery of e-learning. Moreover, innovations in software, hardware, and algorithms are critical for creating interactive, user-friendly, and accessible e-learning platforms. The strong influence of Social Sciences suggests a focus on the human and societal aspects of e-learning, including cognitive processes, educational theory, societal impacts, and cultural considerations in *Tasawuf* Islamic education.
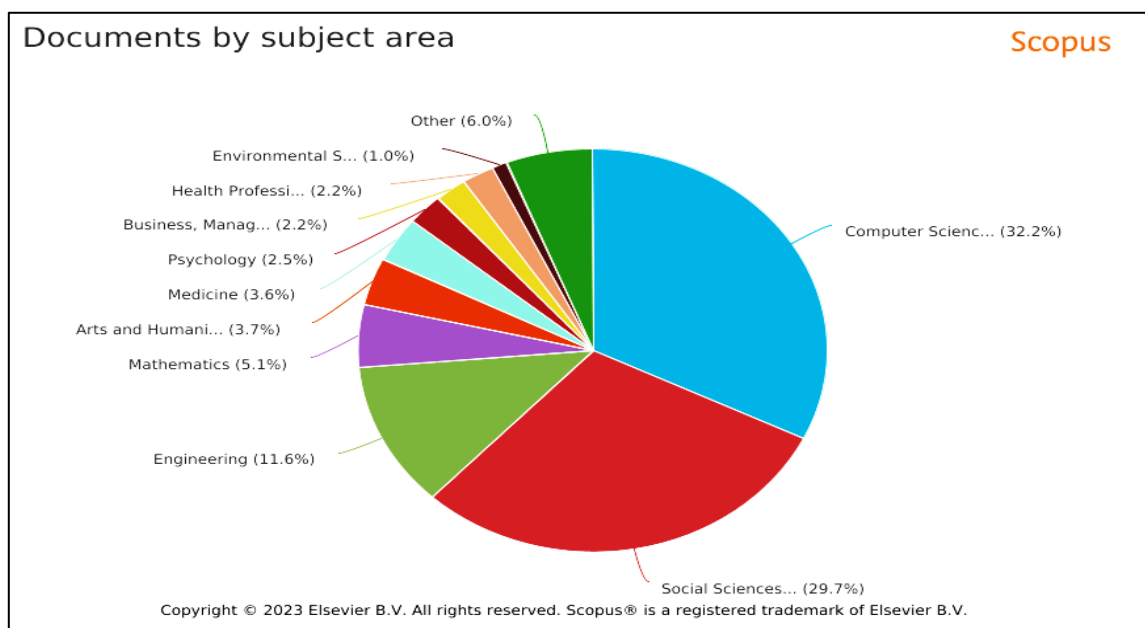

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Fig. 3. The most focused subject areas

Engineering also contributes a substantial 11.6% to the field, which could be attributed to the technical aspects of e-learning systems, such as the design and maintenance of digital infrastructure, user interfaces, and system integration that support the pedagogical goals of *Tasawuf* Islamic education. Other significant areas of contribution include Mathematics, Arts and Humanities, and Medicine. Mathematics could be involved in the development of algorithms and statistical methods for educational data analysis. At the same time, the Arts and Humanities' contribution could indicate an interest in the philosophical and ethical dimensions of e-learning. Medicine's role might involve the design of e-learning for health professionals within the *Tasawuf* context, focusing on the intersection of Islamic education and health care.

The smaller slices of the pie, including Psychology, Business and Management, Health Professions, and Environmental Sciences, though less represented, are still crucial. Each of these fields brings a unique perspective to e-learning, whether it is understanding learner behavior, managing educational resources, ensuring the well-being of learners, or considering the environmental impact of e-learning technologies. The category labeled "Other" suggests there are additional miscellaneous disciplines that contribute to this field, indicating a multifaceted and interdisciplinary approach. This diversity of disciplines reflects the complex nature of e-learning, which requires insights from various fields to address the technological, educational, and cultural challenges of implementing e-learning in *Tasawuf* Islamic education.

In this article, it would be essential to explore how each of these subject areas contributes to the overall understanding of e-learning within the *Tasawuf* context. Highlighting the interdisciplinary

nature of this field could provide insights into potential collaborative opportunities, the integration of diverse methodologies, and the holistic understanding of e-learning's role in Islamic education. Additionally, consider the implications of these findings for educators, policymakers, and technologists working to advance e-learning in religious and spiritual education contexts.

4.4 Which is the Highest Document by Country?

Table 3 indicates that the data provided reflects the global distribution of documents related to e-learning in *Tasawuf* Islamic education as indexed by the Scopus database, offering a geographical perspective on the scholarly output in this field. This distribution is crucial for understanding regional focuses, collaboration networks, and the dissemination of knowledge across various parts of the world. The United States leads the count with 8.24% of the documents, closely followed by the United Kingdom at 8.05%. This suggests that these two countries are significant contributors to the research in e-learning within *Tasawuf* Islamic education. Furthermore, the high output from these countries could be attributed to a combination of factors such as well-established research institutions, funding availability, and a longstanding tradition of research in both e-learning and religious education. Germany and Spain also demonstrate strong contributions, with 7.20% and 6.35%, respectively, indicating active research communities in Europe. Note that these numbers may reflect the broader European interest in educational technologies and the integration of cultural studies within e-learning frameworks. Moreover, Australia and China are tied, each contributing 5.13% to the field, which points to the global reach of this research area. Australia's contribution could be due to its focus on innovative educational practices and the multicultural aspect of its educational research. At the same time, China's equal standing is notable, reflecting its rapid growth in educational technology and a growing interest in diverse educational practices, including *Tasawuf* Islamic education.

Table 3
The highest document by country

Country/territory	Document	Percent
United States	135	8.24
United Kingdom	132	8.05
Germany	118	7.20
Spain	104	6.35
Australia	84	5.13
China	84	5.13
Netherlands	78	4.76
Finland	53	3.23
Indonesia	52	3.17
Italy	51	3.11
Canada	25	1.53
Japan	20	1.22
Taiwan	20	1.22
South Africa	19	1.16

The Netherlands and Finland represent significant research outputs within Europe, with 4.76% and 3.23%, respectively. These figures may be indicative of the robust educational systems and research initiatives in these countries, which often include a focus on innovative and inclusive e-learning solutions. Indonesia's contribution is particularly significant, with 3.17% of the documents. Since Indonesia has the largest Muslim population in the world, it is expected to have a vested interest in the advancement of *Tasawuf* Islamic education through e-learning. This could represent a melding of traditional religious studies with modern educational technologies, which may be a

growing research trend in the region. In addition, Italy also demonstrates a noteworthy contribution, which, along with the other European countries, underscores the continent's role in this research field. While contributing smaller percentages, Canada, Japan, Taiwan, and South Africa still indicate the diversity and worldwide interest in e-learning applied to *Tasawuf* Islamic education. In this bibliometric analysis article, these statistics can be discussed to highlight the international engagement with e-learning in *Tasawuf* Islamic education. It may also be worth exploring the reasons behind the varying output levels, such as cultural interests, the prevalence of *Tasawuf* studies, technological advancements, and educational research priorities in these countries.

Furthermore, the data presents opportunities to examine cross-country collaborations, the flow of academic discourse, and potential gaps in research contributions from countries with significant Muslim populations but lower documented outputs. Hence, addressing these aspects can provide a deeper understanding of the global e-learning landscape in *Tasawuf* Islamic education and may point toward future trends and areas for development.

4.5 What is the Network Map of Co-Authorship about a Country?

Figure 4 about the network visualization map, created using VOSviewer, illustrates the co-authorship connections between countries in the field of e-learning within *Tasawuf* Islamic education. This kind of bibliometric analysis is valuable for discerning the collaborative patterns and the extent of international cooperation in this scholarly area. In the visualization, the size of the nodes (countries) typically represents the number of documents published or the number of authors from that country contributing to the field. In contrast, the lines between the nodes indicate collaborative relationships. Meanwhile, the thickness of the lines often denotes the strength of the collaboration, with thicker lines representing more numerous or more significant joint efforts. The image shows that the United States is a central hub in this network, having the largest node and numerous connections with other countries, signifying a high level of international collaboration in e-learning research related to *Tasawuf* Islamic education. At the same time, Germany and Spain also have prominent nodes, suggesting that they, too, are key players in this research community with strong international links.
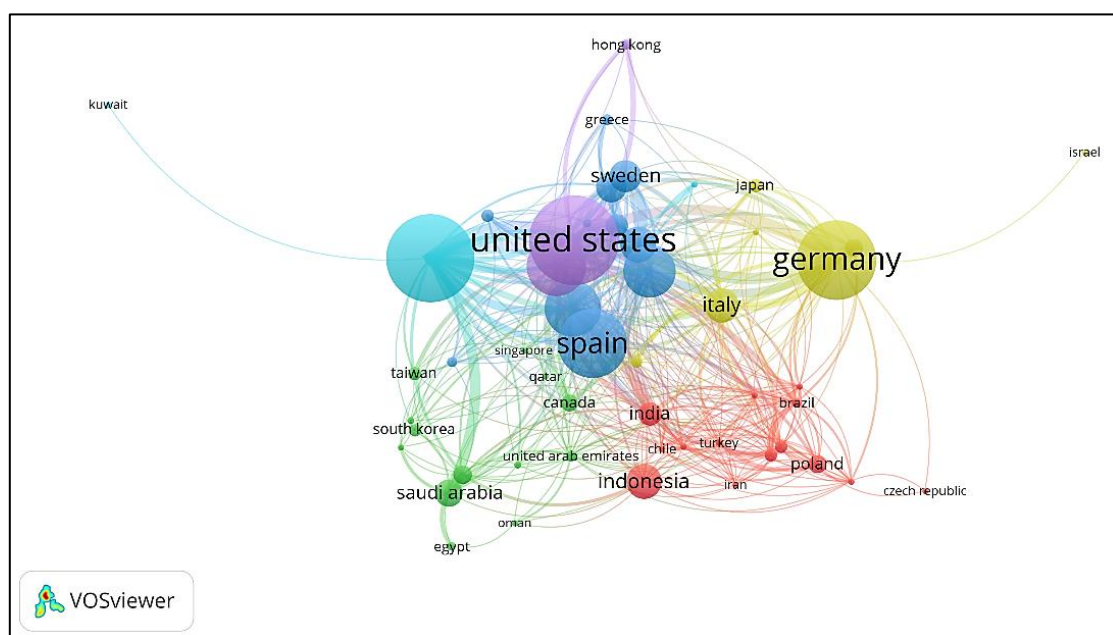

Fig. 4. Network visualization map of co-authorship about a country

The distribution of connections indicates a dense network of collaboration across continents, with European countries like Italy, Sweden, and Greece, as well as Asian countries such as Saudi Arabia, Indonesia, and Taiwan exhibiting significant interaction. This could reflect a global recognition of the importance of e-learning in the context of Islamic education and a collective effort to advance research in this area. Moreover, countries like Indonesia have a notable presence in the network, consistent with its demographic significance in the Islamic world. The connections between Indonesia and other countries may highlight a particular interest in sharing their unique perspective on *Tasawuf* Islamic education via e-learning platforms. Additionally, the presence of countries such as Brazil, Turkey, Iran, and Poland illustrate the diverse interest in e-learning across different Islamic educational traditions and contexts. These connections might also signify emerging research clusters and potential growth areas in the field.

In analysis, it would be insightful to explore:

i. The nature of collaborations: Are they bilateral or multilateral? Do they result in joint publications, shared research projects, or exchange programs?
ii. The impact of these collaborations: How do they contribute to the advancement of e-learning in *Tasawuf* Islamic education?
iii. Geographical and cultural diversity: How do different regions contribute to and influence the research agenda?
iv. The dynamics of the network: Which countries are emerging as new nodes, and what might this indicate about the evolution of the field?
v. The potential barriers to collaboration: Are there countries that appear isolated within the network, and what might be the reasons for this?

Highlighting these points will provide a comprehensive view of the current state of international cooperation and offer insights into potential strategies to enhance collaboration and address gaps in the research network. In addition, this can guide researchers, practitioners, and policymakers in their efforts to foster a more integrated and robust research community in the domain of e-learning within *Tasawuf* Islamic education.

4.6 What Are the Popular Keywords Related to the Network Visualization Map of All Keywords' Co-Occurrence?

Utilizing VOSviewer and considering keywords with a minimum of ten occurrences, an author keyword mapping was generated (refer to Figure 5). This visual representation illustrates the degree of connection between these keywords. Keywords sharing similar colors are typically discovered together in keyword listings. For instance, the figure suggests a strong association among keywords such as classification, support vector machine, fault diagnosis, document classification, data classification, multi-class classification, ant colony optimization, and ensemble learning, as they tend to co-occur frequently.

Fig. 5. Network visualization map of all keywords' co-occurrence

Figure 5 about the network visualization map of all keywords' co-occurrence created with VOSviewer that, have provided is a bibliometric tool that helps to visualize the most prevalent and interconnected topics within a specific field—in this case, e-learning in *Tasawuf* Islamic education. This map provides insight into the thematic structure and research trends by displaying how frequently keywords appear together in the literature. The most prominent node, 'e-learning,' indicates that it is the central theme in the research landscape. Meanwhile, the size of the node suggests a high frequency of occurrence, establishing e-learning as the focal point of the research. Surrounding this central node are clusters of other keywords, each likely representing different thematic areas within the e-learning domain:

i. **Technology Integration**: Keywords such as 'e-learning', 'mobile learning', 'learning analytics', and 'digital transformation' reflect the technological aspects of e-learning. This indicates a strong focus on the tools and platforms that facilitate e-learning, as well as the methods for analyzing and improving these digital learning environments.

ii. **Pedagogical Focus**: 'Teaching', 'higher education', 'curricula', and 'learning outcome' are closely linked, suggesting an emphasis on the instructional design and educational outcomes of e-learning. These terms point to a concern with how e-learning is delivered and measured in terms of student success and curriculum development.

iii. **COVID-19 Impact**: The presence of 'pandemic' and 'COVID-19' alongside 'e-learning' underscores the significant influence of the pandemic on the field. It likely reflects a surge in e-learning research prompted by the shift to remote education during the pandemic.

iv. **AI and Advanced Computing**: Terms like 'deep learning', 'neural networks', and 'reinforcement learning' indicate cutting-edge research that applies advanced computational techniques to e-learning. These might be related to the development of intelligent tutoring systems or adaptive learning platforms that can provide personalized education experiences.

v. **Islamic Education Context**: The keyword 'Sufism' (likely referring to *Tasawuf*) is connected to the broader e-learning discussion, highlighting the specific context of Islamic education. This suggests an intersection of religious studies with modern educational technology, exploring how traditional teachings can be disseminated through new media.

vi. **Social and Human Aspects**: 'Human', 'child', 'female', and 'social media' keywords point towards a focus on the human element in e-learning. This includes considerations of social dynamics in learning, gender studies, and the use of social media as an educational tool.

This map also reveals how interconnected these themes are. For instance, 'Sufism' is not isolated; it relates to broader educational and technological themes. This suggests that e-learning in *Tasawuf* Islamic education is being considered alongside mainstream educational technologies and methodologies. Moreover, this article could discuss how these different clusters represent the multidisciplinary nature of e-learning research and highlight the balance between embracing cutting-edge technology and addressing the specific needs of *Tasawuf* Islamic education. In addition, you might also explore how the connections between keywords reflect current research trends, potential gaps in the literature, and new opportunities for research and development in the field.

4.7 What are the Network Bibliographic Coupling Sources?

The figure explains bibliographic coupling based on sources in VOSviewer, a bibliometric tool that identifies and visualizes the relationships between journals based on how frequently they cite the same references. In the context of e-learning in *Tasawuf* Islamic education, this map provides insights into the scholarly communication and the intellectual base of the field. From the visualization, we can discern several essential points:

i. **Core Journals and Interdisciplinary Nature**: The presence of journals such as "Computers & Education," "Technology, Knowledge, and Learning," and "Internet and Higher Education" at the center of the network illustrates that these sources form the core intellectual base of the field. Their central positioning and the density of connections to them indicate that they are key disseminators of research highly relevant to the intersection of technology and education, including the specific context of *Tasawuf* Islamic education.

ii. **Bibliographic Coupling Strength**: The thickness of the lines connecting the journals suggests the strength of the bibliographic coupling. A thicker line implies that two journals have a substantial number of references in common, often indicating they contribute to the same or closely related research areas. This can reveal clusters of journals likely to publish studies with similar focuses or methodologies.

iii. **Specialized and General Interest Journals**: Some journals, such as "Contemporary Islam," may not be central in terms of e-learning technology; however, they are crucial for the *Tasawuf* Islamic education aspect. Their connection to more technologically oriented journals highlight the interdisciplinary dialogue between the fields of Islamic studies and educational technology.

iv. **Research Trends and Gaps**: The map can also point to emerging trends and potential gaps in the literature. For instance, if journals related to virtual reality are coupled with those concerning *Tasawuf* education, it may indicate growing research interest in applying these technologies in religious educational contexts. Conversely, if certain expected journals are absent or peripheral, this might suggest underexplored areas.

v. **Potential for New Insights**: The map suggests potential avenues for new research by identifying which journals are engaging with similar topics. Researchers might examine these intersections to find innovative approaches or unexplored angles for their work.
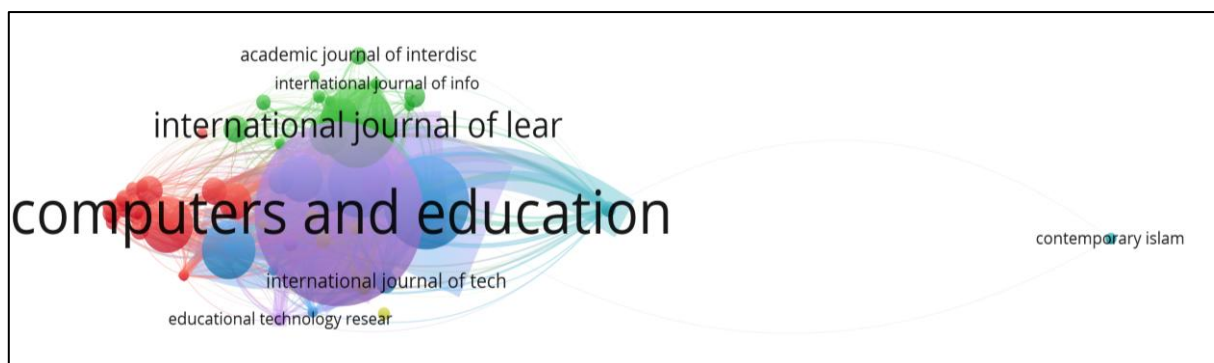
Fig. 6. The network bibliographical coupling sources

In this figure, we can elaborate on these points, discussing how the network of bibliographic coupling informs us about the foundations and directions of research in e-learning within *Tasawuf* Islamic education. It is also an opportunity to comment on the implications for academic publishing, research collaboration, and field development. Might explore how these coupled sources can guide researchers to the most influential journals, help them identify where to publish their work, and demonstrate how to connect with broader discussions within the academic community.

5. Discussions and Conclusions

The journey through the bibliometric data presented in various figures reflects a compelling narrative of the evolution of e-learning in the context of *Tasawuf* Islamic Education. This narrative, spanning from the pivotal year of 2020 to the present in 2023, reveals a dynamically expanding field marked by an ascending trajectory of scholarly interest and publication output. As we delve into the discussion, the onset of the COVID-19 pandemic emerges as a critical inflection point. The year 2020, marked by the pandemic's upheaval, catalyzed a seismic shift towards e-learning, transcending the boundaries of mainstream education to permeate specialized domains, including *Tasawuf* education. Furthermore, the exigencies of the time necessitated an expeditious exploration of e-learning solutions, thereby initiating a surge in scholarly publications. Progressing to 2021, we observe the continuation of this upward trend, suggesting a shift from reactionary measures to a phase of discovery and innovation. Accordingly, researchers began to unlock the potential of e-learning within *Tasawuf*, an exploration driven by necessity and the recognition of e-learning's expansive possibilities. Accordingly, the year 2022 signified a consolidation of these exploratory efforts, with an increase in publications indicative of a dedicated pursuit to refine and tailor e-learning methodologies for *Tasawuf*. This period has likely witnessed the introduction of innovative instructional approaches and the commencement of pilot studies to evaluate these nascent concepts in practical settings. The persistent rise in research activity into 2023 suggests that e-learning is increasingly being embraced as the preferred mode for imparting *Tasawuf* Islamic Education. Additionally, the graph's upward climb, a metaphor for the field's growing confidence, implies that the early implementations of e-learning solutions are now under rigorous evaluation, providing critical insights into their efficacy. Turning our attention to the contributors of this growing body of knowledge, we notice a diversity of scholarly voices from the bibliometric data, with a particular author leading the way in publication output. This leading figure's contributions, possibly pivotal to the field, signal the importance of both quantity and quality of research. While metrics such as citations and h-index offer a window into an author's influence, a closer examination of the thematic, methodological, and theoretical contributions of various authors is essential. Moreover, this analysis reveals an array of pedagogical strategies, technological integrations, and philosophical considerations shaping the field. The

interdisciplinary nature of the research is further underscored by the distribution of subject areas contributing to the field. The substantial involvement of Computer Science and Social Sciences reflects the field's twin pillars: technological innovation and a deep understanding of human and societal dynamics. Other disciplines, including Mathematics, Arts and Humanities, and Medicine, contribute their unique perspectives, highlighting the multifaceted challenges and opportunities in e-learning applied to *Tasawuf* Islamic education. At the same time, the geographical distribution of scholarly output offers yet another dimension of analysis. The significant contributions from countries such as the United States, United Kingdom, Germany, and Spain reflect robust research infrastructures and a keen interest in the integration of educational technologies and cultural studies. The noteworthy participation of Indonesia underscores the relevance of *Tasawuf* education in regions with large Muslim populations and their potential to merge traditional teachings with modern technologies. As we conclude this bibliometric analysis, the global landscape of e-learning in *Tasawuf* Islamic education is characterized by a vibrant tapestry of interdisciplinary collaboration, cultural diversity, and technological innovation. The international engagement with e-learning in this domain invites further exploration into cross-country collaborations, the flow of academic discourse, and the identification of future trends and developmental avenues. Hence, the rich tapestry woven by the data presents a field that is not only responsive to global challenges but also proactive in shaping the future of *Tasawuf* Islamic education through the lens of e-learning.

In concluding the bibliometric analysis for a Scopus journal article on e-learning in *Tasawuf* Islamic education, the network visualization map of bibliographic coupling serves as a powerful tool, illustrating the interconnectivity and scholarly dialogue within this niche field. The analysis of the visualization map reveals a multifaceted landscape of research, with core journals such as "Computers & Education." It anchors the field and fosters interdisciplinary exchanges that extend into Islamic studies through journals like "Contemporary Islam. Furthermore, the bibliographic coupling strength indicates the density of shared references and a community of scholarship. This interconnectedness hints at a collective pursuit of understanding and enhancing e-learning methodologies within the unique context of *Tasawuf* Islamic education. Furthermore, the visualization map has uncovered emerging trends, such as the potential incorporation of virtual reality and AI into religious education and highlighted potential gaps where further research is warranted. These insights are pivotal for guiding future research trajectories and fostering innovative approaches that could fill identified literature voids. The map also provides strategic value to researchers, indicating the most influential journals for dissemination and potential collaboration. It underscores the importance of choosing the right venues for publication to ensure that new findings resonate within the academic community and contribute constructively to the ongoing discourse. In essence, this bibliometric journey through VOSviewer's bibliographic coupling has not only painted a picture of the current state of e-learning in *Tasawuf* Islamic education but also charted a course for future scholarly endeavors. It calls upon researchers to contribute to and leverage this rich tapestry of knowledge, ensuring that the field continues to evolve with both scholarly rigor and innovative spirit. As the analysis draws to a close, it becomes clear that the dynamism of this field is reflective of a broader trend towards embracing technology in education while remaining deeply rooted in the cultural and spiritual nuances of *Tasawuf*.

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