

REVIEW PAPER

Exploring Muhammadiyah's Research Landscape: A Bibliometric Analysis and Emerging Trends

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ABSTRACT

Keywords:
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Muhammadiyah
Research

This research aims to analyze the developmental map and direction of Muhammadiyah research using bibliometric studies to classify processed data based on author, year of publication, country of publication, and network analysis. Utilizing bibliometric analysis and quantitative methods from the Scopus database, 701 articles were collected, analyzed, and visualized. The majority of Muhammadiyah research authors are based in Indonesia. The most influential source is the Journal of Physics: Conference Series. Consequently, we identified four focal points of Muhammadiyah research, including (1) student learning, (2) Muhammadiyah and humanitarian issues, (3) Muhammadiyah human resources, and (4) Muhammadiyah research methods.

ABSTRAK

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Penelitian ini bertujuan menganalisis peta perkembangan dan arah penelitian Muhammadiyah menggunakan studi bibliometrik untuk mengklasifikasikan data yang diolah berdasarkan pengarang, tahun terbit, negara penerbit, dan analisis jaringan. Menggunakan analisis bibliometrik dan metode kuantitatif dari database Scopus, 701 artikel dikumpulkan, dianalisis, dan divisualisasikan. Sebagian besar penulis penelitian Muhammadiyah berasal dari Indonesia. Sumber yang paling berpengaruh adalah Journal of Physics: Conference Series. Hasilnya, kami mengidentifikasi empat fokus penelitian Muhammadiyah, meliputi (1) pembelajaran siswa, (2) Muhammadiyah dan isu-isu kemanusiaan, (3) sumber daya manusia Muhammadiyah, dan (4) metode penelitian Muhammadiyah.

INTRODUCTION

In the era of the industrial revolution 4.0, everything moves very quickly and dynamically (Putra & Suparman, 2020). Access to adequate technology makes many areas of life massively developing. The barriers of distance and time can be overcome easily by the presence of technology. This development is seen especially during the Covid-19 pandemic which forces the world community to innovate more rapidly to create

more efficiency in vital sectors (Nurdin et al., 2022). Inability to adapt to the pace of development of this technology will result in lagging behind (Gupta & Randhawa, 2023).

Muhammadiyah as the largest Islamic organization in the world (Thamrin & Septiawan, 2017), has a large and strong distribution of charitable efforts and proselytizing activities. Through the spirit of progress, Muhammadiyah is engaged in the development of strategic areas such as education (Hidayati et al., 2022), politics (Arifianto, 2021), economics (Mutamimah et al., 2022), health (Marini et al., 2022), social (Sobhan et al., 2022), and arts and culture (Nashir et al., 2019). Muhammadiyah's readiness and ability to adapt to technological explosions in various fields is demonstrated by the increase in scientific publications in each field.

As a general purpose, the findings of bibliometric research can be a reference and a place to start for researchers to study a particular topic. The results of bibliometric research can be utilized not only by researchers, but also by practitioners, policymakers and the general public indirectly (Purnomo, 2019). It is very important to conduct a critical analysis on the findings of existing research to pave the way for further research while providing projections as a proposal for Muhammadiyah on the areas that need to get a greater share of development acceleration. This evaluation procedure is highly dependent on the availability of data from scientific research activities as well as the accuracy of such data. Bibliometric indicators are one of the tools that play a role in evaluating the results of scientific research; assessing the interaction between science and technology, producing mapping of fields of science, tracking / tracing the development of new knowledge in certain fields, and are indicators in the future in making strategic plans (Boquera et al., 2021; López Belmonte et al., 2020; Zheng et al., 2019).

In the field of social economics, research by Sobhan et al. (2022) claimed that the counter productiveness of the Muhammadiyah West Sumatra Waqf Institution is a result of the Muhammadiyah Waqf Institution's poor grasp of the regulation material as a guideline for waqf management, which is restricted to translation and interpretation but not extrapolation. Muhammadiyah Islamic microfinance research conducted by Mutamimah et al. (2022) demonstrates that BTM Muhammadiyah in the province of Central Java has adopted risk management utilizing various standards. Nonetheless, only a portion of these risks are managed, with particular risks being prioritized despite the fact that they are managed using distinct techniques. Ichsan (2022) stated that in the field of social health research, Muhammadiyah has a quick response in helping victims of natural disasters at diverse regions during the epidemic. In religious studies, Muhammadiyah has *manhaj tarjih* which is unique for Muhammadiyah as a modern renewal movement (Fanani et al., 2021). In the environmental field, it is known that Muhammadiyah includes ecological interests in the orientation of its organizational programs, as evidenced for one of them is an in-depth study of water jurisprudence (Efendi et al., 2021).

The primary mission of da'wah and *tajdid* of Persyarikatan Muhammadiyah in its movement necessitates the creation of programs that are able to anticipate and provide actual answers in light of the increasingly dynamic development of life in the local, national, and global spheres in a variety of contemporary and very modern spaces, as well as the multifaceted nature of this development (Fauzi & Ayub, 2019). Through universities, Muhammadiyah must be able to contribute towards the many thoughts in the context of national and state life born at every level of life (Maulani et al., 2019). In addition to this spirit, it is equally important, if not, more important to study Muhammadiyah itself, both in its capacity as the largest Islamic organization in Indonesia and in terms of the functions and positions it plays in the context of varied responses to various challenges of a local and global nature (Musawar & Suhirman, 2021).

Attention to the field of research and development, as stated in the 47th *Tanfidz Mukhtamar*, also leads to the effort to build networks with research and development centers both at home and abroad, especially from the Islamic world region with a proselytizing approach and a progressive Islamic spirit (Efendi et al., 2021). The publication of Muhammadiyah's research into various fields of research shows that Muhammadiyah has a commitment to Islam that advances in all fields of life (Muyasaroh et al., 2020; Shodiq et al., 2019).

METHOD

The Muhammadiyah development map and research direction are quantitatively assessed using bibliometric approaches in this study. When bibliometric analysis is combined with content analysis, it is becoming more and more common among academics. Together with bibliometric reviews, descriptive, inclusive, institutional, or meta-analytical reports are used to make sure that the literature is reliable and valid. Still, bibliometric analysis has only been used a few times in Islamic finance. This is because of its benefits (Alshater et al., 2021), such a method is also different from other similar review techniques in how deeply and thoughtfully it looks at the most important parts of the thing it is focused on (Apriantoro et al., 2022).

Bibliometric analysis methods were used in the study. Information was obtained by using the Boolean search engine to comb Scopus pages between 1995 and 2022. The search was conducted on August 26, 2022. Scopus was chosen because it is a database of abstracts and citations of reference materials curated by specialists in the field who are acknowledged for their expertise. Scopus is a sophisticated search and analytics tool with a wealth of data sources for promoting ideas, people, and institutions among researchers, librarians, research managers, and funders. Scopus includes 1.8 billion references sourced since 1970, 84 million records, 17.6 million author profiles, 94.8 thousand affiliate profiles for 7,000 publishers, and 84 million records (Scopus, 2022). Researchers used R and Rstudio, VosViewer and Microsoft Excel to analyze citations, document content, and networks. The procedure applied was duplicated from previous research, which used

bibliometric analysis to produce maps on research themes in various fields, such as manufacturing (Caviggioli & Ughetto, 2019) and tourism sustainability (Bhatt et al., 2020).

In the first phase, researchers will conduct a literature review of related themes to ensure that relevant research is carried out on bibliometric topics. In addition, a literature review is useful to determine the appropriate keywords and is seen as representing the scope of the research. As for the second stage, in order to get an idea of whether the study will include the minimum amount required, the researcher will look at the number of publications that have been published. If there are hundreds of publications, for example, more than 500, this figure can be said to be substantial and sufficient to guarantee the use of bibliometric analysis. The area of study is considered small if there are only dozens of published documents, hence the application of bibliometric analysis to this field of study is not justified, since the analysis on a limited scale will be redundant. In this case, it would be better to use a meta-analysis and systematic review of the existing documents (Cabeza-Ramírez et al., 2020). At this point, researchers did a search on Scopus using boolean operators (TITLE-ABS-KEY (muhammadiyah) OR TITLE-ABS-KEY (aisyiyah)), which resulted in 716 documents. Also, filtering is done with a boolean operator (TITLE-ABS-KEY (muhammadiyah) OR TITLE-ABS-KEY (aisyiyah)) AND (EXCLUDE (PUBSTAGE, "aip")) AND (LIMIT-TO (LANGUAGE, "english")) to get articles in the press and only documents in English so that the final document is 701.

The third stage, Analysis, is divided into three stages. We begin with broad data acquisition. In this area, we gather generic information regarding data sets and the evolution of literature throughout time. We also go over important components of the literature, such as the main relevant writers, their countries of origin, and affiliations. Using Bradford's Law, we created the analysis to deal with the primary source. Ishak (2005) states that Bradford's law is used "to analyze the output of a set of journals in a specific topic during a given time period. Bradford's law of distribution or dissemination states that the number of papers distributed in fewer journals is greater, while a large number of journals have proportionally less articles." Second, we conducted a citation analysis. This section highlights the most often mentioned texts, references, and sources, as well as the authors' sources and impacts. Third, we used bibliographic analysis, co-citation and co-occurrence analysis to conduct network and content analysis. To provide the most accurate grouping, we apply hierarchical analysis (dendrogram).

These representations are commonly referred to as maps and used to conduct network analysis such as co-authorship, co-occurrence, and co-citations. Authors, sources, countries, and keywords can all have joint relationships. VOSviewer is also used for bibliographic merging. We supplement RStudio with Microsoft Excel because the latter's graphs are difficult to be updated due to their use of Excel and bibliometric coupling pairs. Co-authorship and co-occurrence will be used in this study to chart the evolution of research on the publication of Muhammadiyah themes. Meanwhile,

bibliometric coupling is being used to determine authorship trends via the most dominant networks. This research procedure can be seen in the following [Figure 1](#).

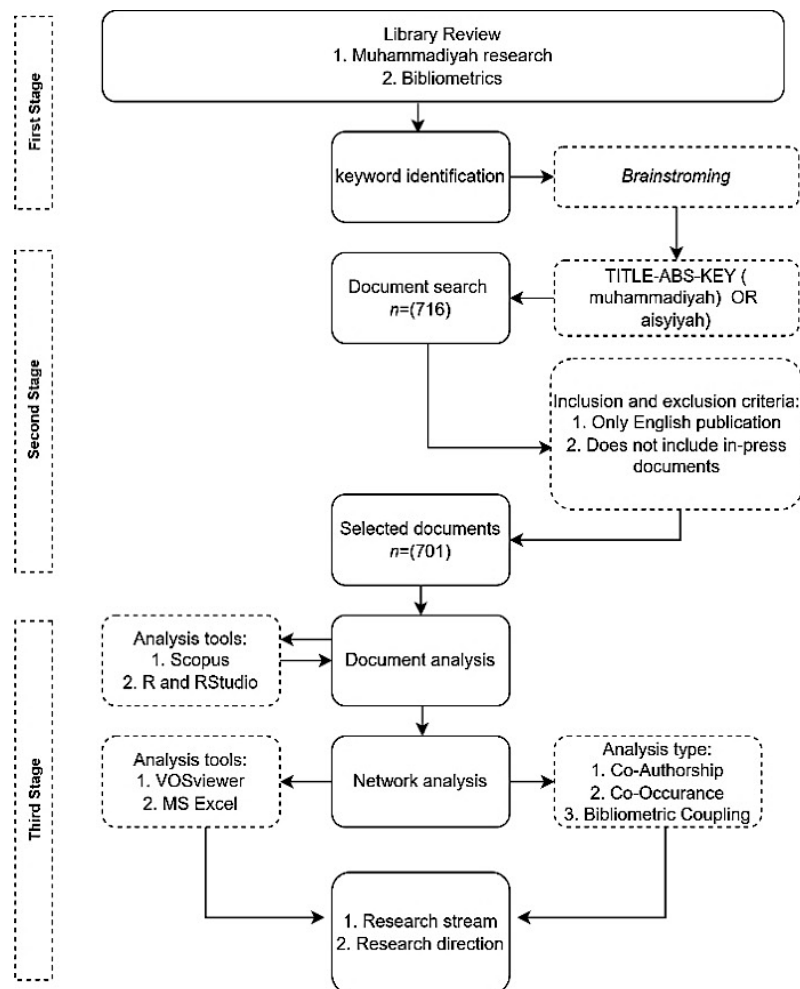


Figure 1. Research Procedure

RESULTS AND DISCUSSION

[Figure 2](#) explains the document's map of research progress and the direction of Muhammadiyah's research from year to year. The graph depicts the evolution of papers from 1995 to 2023, with no development from 1995 to 2009, a reasonably strong development of documents was published from 2017 to 2019, with a peak of 210 publications in 2020. According to the data collected, there is a decrease in document publications from 2020 to 2021, with a pretty drastic drop to 47 published documents per year.

[Figure 3](#) discusses the ten most relevant writers to this publication. The development of data is related to the academic writing community, the most prominent affiliate institutions, and the most influential countries. Suparman is the first author with the most influential publication, with 20 published papers, followed by Suyatno, Burhani, Prayitno, and others.

[Figure 4](#) describes the ten most relevant institutional affiliations with Muhammadiyah research. The University of Muhammadiyah Yogyakarta is the

institution that publishes the most articles, with 88 publications, followed by Universitas Muhammadiyah Surakarta, with 70 publications that published enough articles as well.

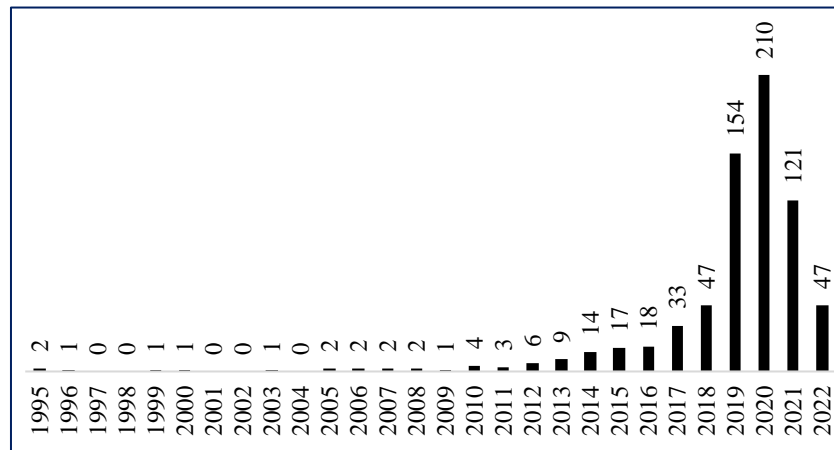


Figure 2. Muhammadiyah research documents per year

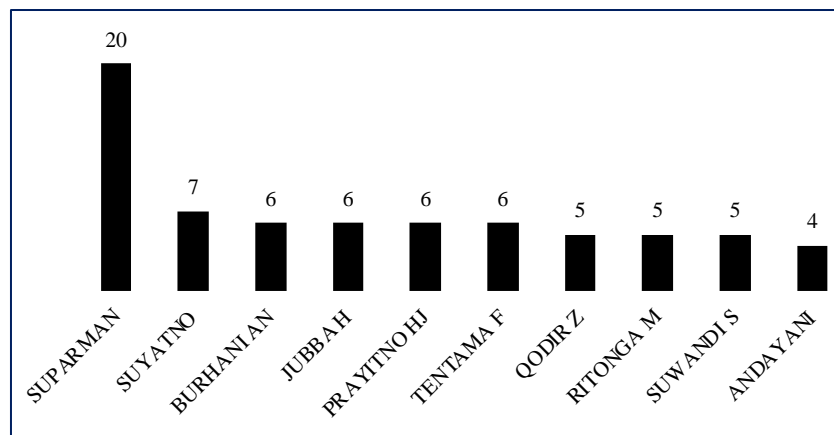


Figure 3. The most influential author in Muhammadiyah research

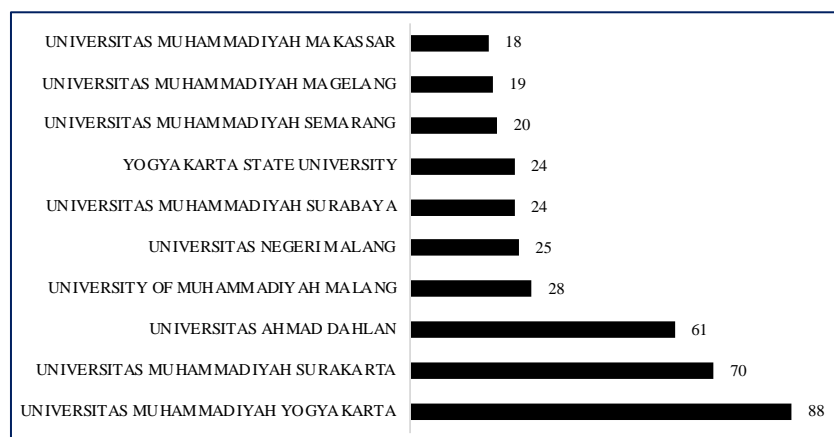


Figure 4. Most relevant affiliations

Figure 5 explains the countries that are most influential on the application of documents based on the country of their institutions. The country with the most publications of documents is Indonesia, with 635 publications, because most of the

publication institutions from universities are from Indonesia. In contrast, other countries such as Malaysia, Australia, and America are less influential in document publications.



Figure 5. Most influential countries

According to **Figure 6** of Bradford's law study, there are several key journals with low productivity but of high quality. The Journal of Physics: Conference Series has the highest frequency, with 133 articles, followed by the International Journal of Scientific and Technology Research, IOP Conference Series: Earth and Environmental Science, Asian EFL Journal, and the Universal Journal of Educational Research, which has the lowest frequency.

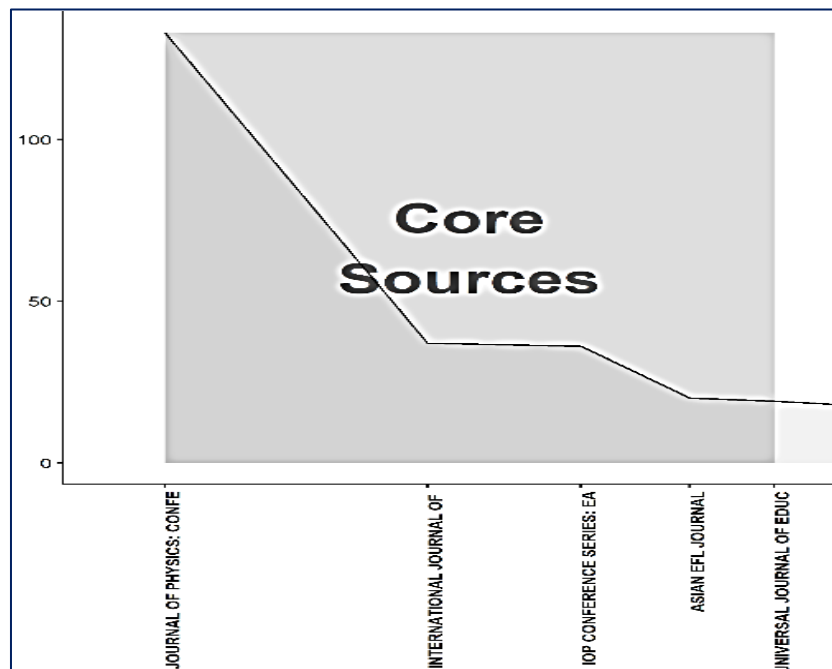


Figure 6. Source clustering through Bradford's law

The citation section contains information on the examination of worldwide document citations, references, and authors' influences. According to **Table 1**, the most cited article with the theme of Muhammadiyah development map research is the book Contemporary developments in Indonesian Islam: Explaining the "conservative turn" which is a book published at the Institute of Southeast Asian Studies. **Table 2** lists the top ten local and global citations, while **Table 3** and **4** discuss the influence of author and

sources, respectively. The Institute of Southeast Asian Studies is identified with the most citations, while the Journal of Physics: Conference Series is identified with the most citations (136 in total).

Table 1. Publication based on global citation

Author	Year	Journal	Citations
Martin van Bruinessen	2013	Institute of Southeast Asian Studies	133
Indarti S. et al.	2017	Journal of Management Development	69
Irwanto et al.	2018	International Journal of Instruction	42
Mitsuo Nakamura	2012	Institute of Southeast Asian Studies	40
Rita Novita et al.	2012	Journal on Mathematics Education	40
Edy Surya et al.	2017	Journal on Mathematics Education	38
Y. Pantiwati & Husamah	2017	International Journal of Instruction	34
Rahardjanto A. et al.	2019	International Journal of Instruction	30
Nasrudin N. et al.	2018	International Journal of Engineering and Technology	27
Fitriati Azmi & S. Azhar	2017	Journal of Theoretical and Applied Information Technology	26

Table 2. The most locally and globally cited references

Document	Local Citation	Global Citation
Rittle-Johnson, B., (2017)	12	94
Chandler, C.K., Holden, J.M., Kolander, C., (1992)	6	825
Brown, H.D., (2001)	4	78
Hefner, R.W., (2000)	4	2024
Nashir, H., (2010)	4	152
Ahmadi, A.K., Zamani, M., Sarzaym, M., (2014)	4	33
Anis, M., (2012)	3	20
Bush, R., (2009)	3	247
Darban, A.A., (2000)	3	135
Fomunyan, K.G., Teferra, D., (2017)	3	72

Table 3. Author's impact

Author	H Index	G Index	M Index	TC	NP	PY Start
Burhani An	4	6	0,333	43	6	2011
Suparman	4	7	1	60	20	2019
Fitriati A	3	3	0,375	46	3	2015
Irwanto	3	3	0,6	73	3	2018
Ma'ruf M	3	3	0,75	15	3	2019
Marisda Dh	3	4	0,75	16	4	2019
Nashir H	3	3	0,75	12	4	2019
Saputro Ad	3	3	0,6	73	3	2018
Tentama F	3	3	0,75	16	6	2019
Ali M	2	2	0,25	6	3	2015

H-index = an author has an h-index 'h' when they have h papers that have been cited at least h times, G-Index = is where the top G articles have jointly received G citations, M-index = is the H-index divided by the number of years of active authors, Tc = Total Citations, Np = Number of papers, Py_Start = beginning of the year of publication.

We used bibliometric coupling analysis in VOSviewer software to map citations for 103 Muhammadiyah papers. Bibliographic coupling analysis classifies articles by the similarities in citing a source that refers to the same set of publications. The closer the

coupling bibliographic tie between the papers, the more references are mentioned jointly in the two publications (van Eck & Waltman, 2010). During the bibliographic coupling analysis, we established the analysis item as a document and used the fractional analysis approach.

Table 4. Source's impact

Source	H Index	G Index	M Index	TC	NP	PY Start
Journal Of Physics: Conference Series	5	6	0.833	136	133	2017
Al-Jami'ah	4	4	0.308	21	7	2010
Asian EFL Journal	4	7	0.5	57	20	2015
Indonesian Journal of Islam And Muslim Societies	4	6	0.4	46	11	2013
International Journal of Scientific Technology Research	4	7	0.8	65	37	2018
Journal of Indonesian Islam	4	7	0.25	53	12	2007
Islamic Studies	4	5	0.143	32	13	1995
Universal Journal of Educational Research	4	5	1	39	19	2019
Asian Social Science	3	3	0.375	9	3	2015
Asian Studies Review	3	3	0.429	35	3	2016

During the bibliometric review process, fractional coupling allows you to have multiple levels of control to lessen the effect of documents with a lot of authors. The minimum number of citations for a paper is set to and the minimum grouping value is set to 7 so that groups can be found. This parameter tells us which 33 of the original 103 articles are being talked about. The results of the bibliographic analysis of couplings done with VOSviewer are shown in Figure 7. We managed to find three groups. Figure 7 shows that "cluster" 1 (red) with 13 articles, "cluster" 2 (green) with 11 articles, and "cluster" 3 (blued) with nine articles.

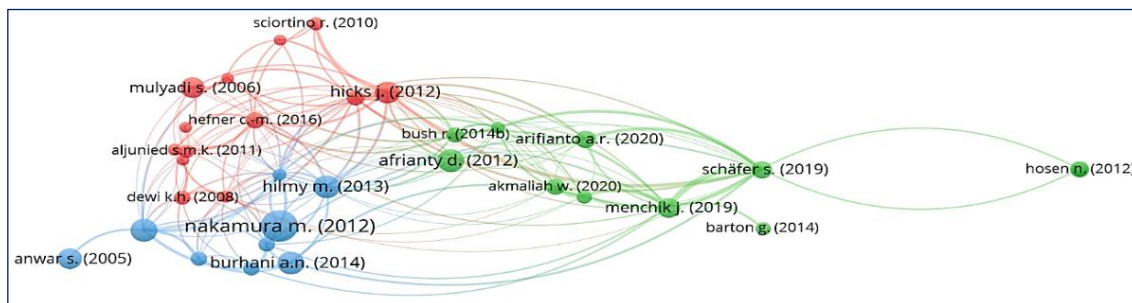


Figure 7. Bibliographic coupling

In the next stage, we performed a co-citation analysis using the document sources to visualize the network between journals with published articles in relation to Mapping the developmental direction of Muhammadiyah. Co-citation analysis shows the interconnectedness and interconnection between the article and the research topic (Hota et al., 2020; Wang et al., 2016). Figure 8 shows the interrelationships between one another is very strong. We set a minimum limit of 10 and produced 94 articles in 5 clusters. The

position of these five clusters shows that articles published by different journals, had published papers on Muhammadiyah research which resulted in a close relationship between these sources.

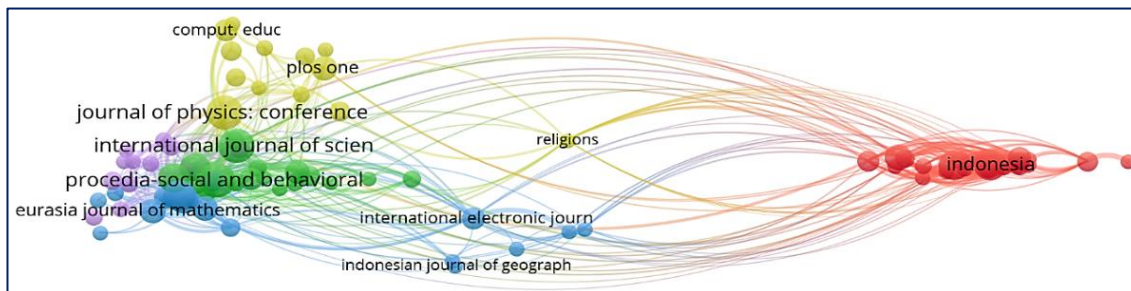


Figure 8. Co-citation analysis

We looked at the results of writing using the fractional counting method to learn more about tracking in clusters. The goal of fractional counting is to lessen the impact of documents based on how many authors they have. As a unit of study, the authors looked at co-authorship in two different ways. The minimum level of country papers and the least number of citations are both set to "1" for a full analysis of where the document sources came from. Based on the parameters shown in Figure 9, 20 articles were divided into four groups. Figure 9 shows the co-authorship analysis results, which used the author as the unit of analysis. As shown in Figure 10, we have set a similar criterion for each country as the unit of analysis. With 13 groups, a total of 20 articles were found.

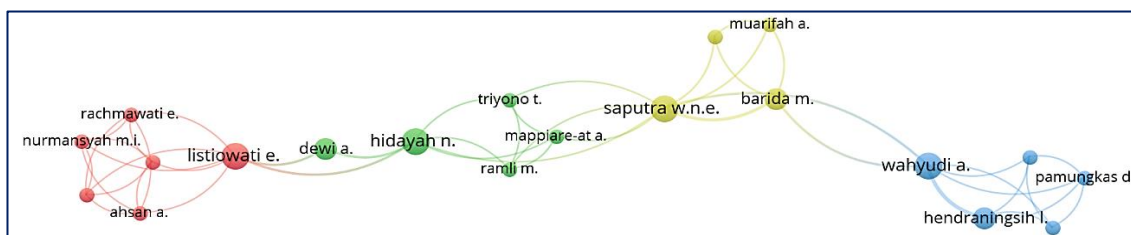


Figure 9. Co-authorship by author

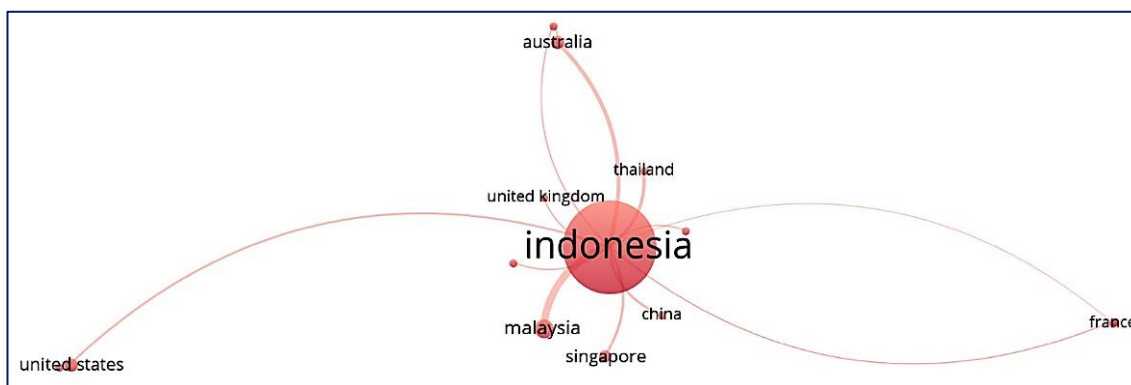


Figure 10. Co-authorship by countries

We present a cartography analysis resulting in confirming the findings. This is beneficial because bibliometrics recorded traces of publications about Muhammadiyah were first carried out until the latest research today. VOSviewer also provides cluster

analysis showing the relationship between one topic and another. Although there were three clusters identified by the bibliographic coupling, the 103 Muhammadiyah publications selected for bibliometric assessment showed the possibility of three clusters based on the results of co-citation and co-authorship. Therefore, we conducted a cartographic analysis to determine the underlying research theme based on the article keywords.

The visualization in [Figure 11](#) is the mapping based on keywords that are included in the theme of our research, mapping research on Muhammadiyah. By default, this image is labeled and denoted as a circle in VOSViewer. Image reading is based on the size of labels and symbols, and various studies have developed that the larger the keyword circle, the more important it seems, increasing the intensity of the appearance of the circle. We chose as the method of analysis and all keywords as the unit of analysis. The minimum citation count is set to '8.' For 56 articles, we discovered three major categories. The cluster is represented by the first cluster in 'red', the second in 'green,' and the third in 'blue.' Keywords and their frequency of occurrence are reported.

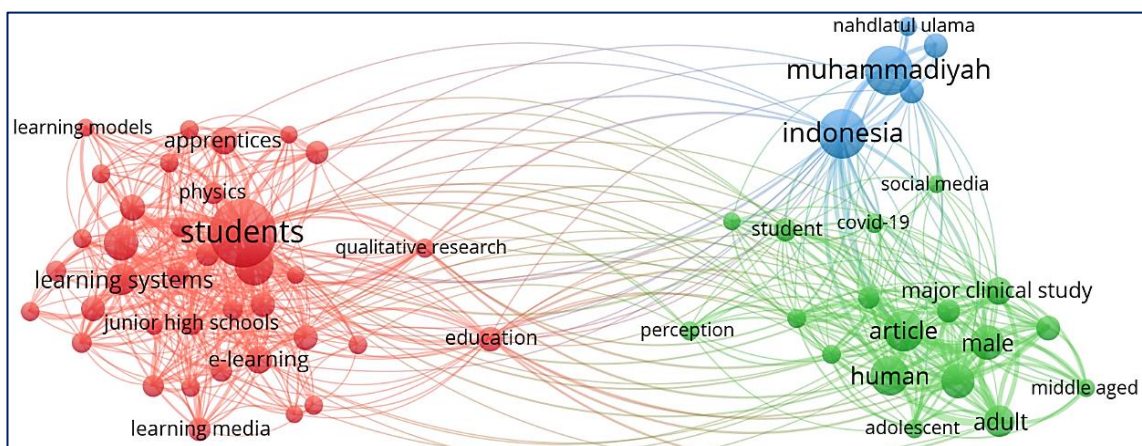


Figure 11. Cartographic analysis

VOSviewer results for co-occurrences based on bibliographic data. The number of keyword occurrences was 3195, and 56 article items, and then terms that were not linked to the article, such as the country, articles, and data that were not relevant to this study, were removed. As a result, three clusters were identified as the trend in this Muhammadiyah research issue. Upon the analysis, we proceeded by analyzing each cluster separately. We discovered three keywords linked to research trends. The keyword 'student' has the maximum total strength linkages and co-occurrences in the first cluster. Student-centered learning is a method of encouraging students to participate actively in their learning.

We can say that there are 20 keywords in Cluster 2, and the ones that come up the most are "Muhammadiyah" and "Human." So, the role of Muhammadiyah transpires when it comes to helping people. When it comes to helping people in Indonesia, Muhammadiyah acts as an organization that gives people a place to voice their concerns, like during the covid-19. The Muhammadiyah Covid-19 Command Center was created

as a cross-assembly group to deal with the effects of COVID-19. In its early days, the Muhammadiyah movement had three main goals: to educate, to heal, and to feed. Education, health care, and poverty are all problems that Muslims and Indonesians have in common.

While cluster 3 is broken into 11 different terms, we can infer that there are many Muhammadiyah study methodologies. The first is the E-learning approach, which is a learning procedure that involves teachers and participants meeting at the same time. E-learning allows the two parties to interact online. There is also a qualitative method, which is an approach that relies on in-depth observation. As a result, using qualitative methods in research can result in a more comprehensive examination of a phenomenon. The answer to the knowledge that all human acts affect the internal characteristics of the individual is the qualitative study that focuses on humanism or the human as individual and human behavior.

This study's discussion was expanded to include pertinent research. Through a bibliometric library assessment approach, we detected several research gaps or variances. In the first cluster of Muhammadiyah, the focus of learning on students has a conceptual nature, as there is no empirical evidence since not all learning is only student-centered. Teachers, the environment and parents also affect the learning system of the students. As a result, we found out that no other learning generalizations related to the influence of teachers, parents or curricula that still use learning that is not student-centered.

Cluster 2 discovered the relationship between Muhammadiyah and humanitarian issues, considering that these two things are very influential on each other because Muhammadiyah contributes a lot to the community and provides a forum to voice out and help people in need financially or not. And cluster 3 only focuses on the qualitative research. Even though the method used to present the data was quantitative too, but it was not included in this cluster. Also, there are methods that use both qualitative and quantitative along with many research methods, however they did not appear in this cluster, hence as a result the research methods used are only that and the scope of analysis is not wide. And it is also mentioned that E-learning is one of the most effective and very easy to be implemented, seeing that education is a bridge between students and interconnected learning methods.

CONCLUSION

The study's important demographic details revealed that the majority of the studies were conducted in Indonesia and Malaysia, and it's worth noting that Muhammadiyah's research direction research was seen by the majority of Indonesian authors and very few authors who were not from Indonesia over the last ten years. Despite promoting varied geographical locations, published articles foster a deep sense of communal and cooperative study among experts. The most influential affiliations are found at the University of Muhammadiyah Yogyakarta and Ahmad Dahlan. It is known that the most

cited source is a book entitled “Contemporary developments in Indonesian Islam: Explaining the ‘conservative turn’”, a book published at the Institute of Southeast Asian Studies, with a total of 133 citations. After going through the mapping of Muhammadiyah research, the same theme, specifically about Muhammadiyah, provides that the concentration of learning is taken over by the students themselves in order to develop their mind set. But there are differences with other studies since learning must also be supported with teacher facilities and the specified curricula.

The second subject explores the relationship between Muhammadiyah and humanitarian issues, the third theme discusses Muhammadiyah's engagement in exploiting existing human resources, and the fourth theme discusses the research methodologies utilized in Muhammadiyah study. This research will continue to progress and become more advanced in order to bring about the benefits in the future. This research is not free from limitations. Among them are limited resources in the Scopus database and language restrictions to English publications only. Suggestions for further research are to utilize databases other than Scopus and expand the use of language.

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