



Bibliometric Analysis on Covid-19 Research Publications

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Abstract

The variety of research topics will develop along with the development of science and conditions experienced by society. In the beginning, it was unpredictable that COVID-19 would paralyze many human activities. This also has an impact on science, this epidemic provides a new discourse in conducting research. Due to the emergence of the COVID-19 pandemic, a lot of research has turned its focus on this topic. This study aims to map research that discusses COVID-19 in Indonesia which is indexed by Scopus. The results of this study indicate that many studies in Indonesia discuss online learning that occurred during the COVID-19 pandemic.

Keywords: Bibliometric Analysis; COVID-19 Research; Online Learning; Scopus Index; Research Mapping

1. Introduction

Corona Virus Disease 2019 or commonly abbreviated as COVID-19, has succeeded in changing people's habits. In previous years, it was unthinkable for the general public that there would be a virus that completely crippled their daily activities. The pandemic has changed various sectors of society, such as the economy, education, industry, tourism, and so forth. From the education sector itself, colleges received a great deal of impact, resulting in the changing of face-to-face learning to online learning, restrictions on organizational activities, and restrictions on visits to libraries. The impact is also affected the research conducted by lecturers and students. They have to think about how to continue their research despite the pandemic. However, it can't be denied that COVID-19 also brought up new research topics for scholars from various fields.

From the official WHO website, it is known that there are as many as 551,226,298 confirmed cases of COVID-19, including 6,345,595 deaths, and a total of 12,037,259,035 vaccine doses have been administered (World Health Organization, 2021). These statistics, especially the death count, are quite overwhelming because there were real people who lost their lives after being infected by this virus for each number. The urgency of this statistic on case numbers leads to a lot of new research being proposed in the research world. In Indonesia, there are already many studies indexed by the Scopus database regarding COVID-19. Until now, research on COVID-19 as a topic indexed by Scopus has reached 1991 articles. Based on these 1991 articles, a lot of research is related to the topic of health. However, some articles are not from the health sector.

This study aims to see the research trends regarding COVID-19 until 2022. The term research trends refer to common action of a group of researchers, each of which starts to pay significant attention to a specific scientific topic (Mazov et al., 2020). For this purpose, this study uses research data limitations that do not come from the health sector. From this research, it will be known which non-medical research keywords that have a close relationship with Covid-19. The results of this study can be used as input for researchers to determine the right topic related to COVID-19 and according to their field of expertise, and to ensure the renewal of further research.

2. Research Method

The research method used in this research is bibliometric analysis. Bibliometric analysis is a popular method for exploring and analyzing large volumes of scientific data (Donthu et al., 2021). The bibliometric was chosen as the analysis method because this study explored data obtained from Scopus. Due to the large quantity of the data used in this study, data limitations are given to achieve the objectives of this research. Research data is explained in two sections, namely data collection and data characteristics.

2.1 Data Collection

Data was collected by accessing Scopus from Diponegoro University Single Sign On. From there, search for articles according to the following search query (TITLE (covid-19) AND KEY (covid-19) AND AFFILCOUNTRY (indonesia)) AND (LIMIT-TO (DOCTYPE, "ar")). This query has the meaning of:

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we will look for articles with the title COVID-19 and contain the keywords COVID-19 and have an affiliate country in Indonesia. This query is not given a year limit in order to discern whether any articles were written before the COVID-19 outbreak in Indonesia, in particular before the year of 2020.

There are 1,991 articles that meet the criteria. The whole article was not used in this research. Several subject areas in the health sector were not selected to focus the objectives of this research. After filtering the data from 1,991 articles, finally 781 data that matched the criteria used were obtained.

2.2 Data Characteristics

The results of data collection, obtained the following characteristics:

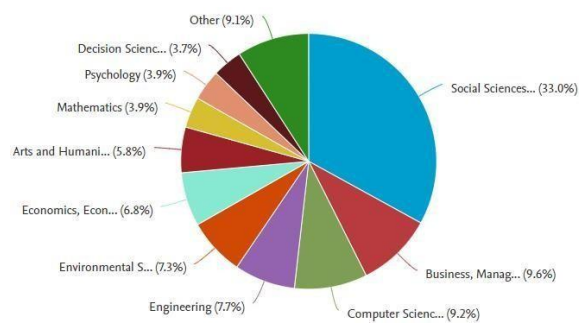


Fig. 1. Document by Subject Area

As stated in Figure 1, subject area related to COVID-19 is Social Sciences which occupies the highest percentage 33%, then in second place is Business, Management and Accounting 9.6%, Computer Science 9.2%, Engineering 7.7%, Environmental Science 7.3%.

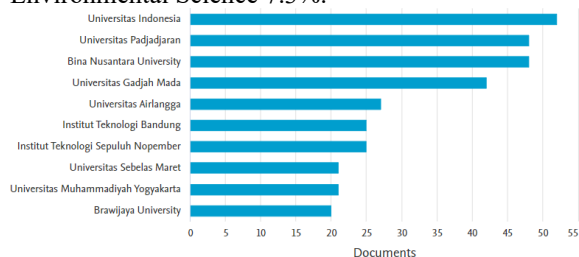


Fig. 2. Document by Affiliation

Based on the data contained in Figure 2, the University of Indonesia has the highest number of affiliates throughout 2019 to 2022, followed by Padjadjaran University, Bina Nusantara University, Gadjah Mada University, Airlangga University, and many other institutions. Still, the number of this affiliation hierarchy does not include the number of articles. In other words, if in one article title there are 2 authors with different affiliations, then each of them will be counted as 2 affiliations in Figure 2.

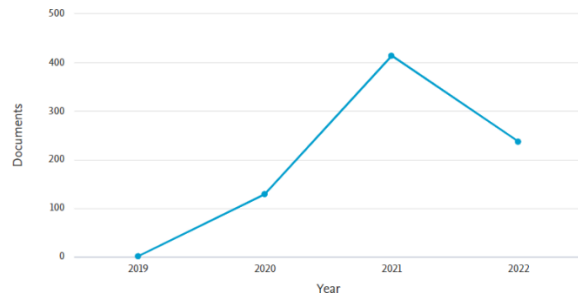


Fig. 3. Document by Year

Figure 3 shows that in 2020, research using title and keyword COVID-19 started to rise with a total of 129 articles. In 2021, the research with these titles and keywords reached a peak of 414. It is also possible that by the end of 2022, research with this title and keyword will exceed the number in 2021. The number of articles taken until mid-2022 that met the criteria was 237 articles. According to the data in Figure 3, it was found that before 2020, research discussing COVID-19 already existed even though there was only 1 article.

3. Result and Discussion

The data that has been obtained is then processed using VOSviewer. This software tool uses the Visualization of Similarities mapping technique where the map are built by applying a mapping algorithm to the whole network formed using the relationship among the selected units of analysis (Cobo et al., 2011). This mapping technique created the results as shown in Figure 4 below:

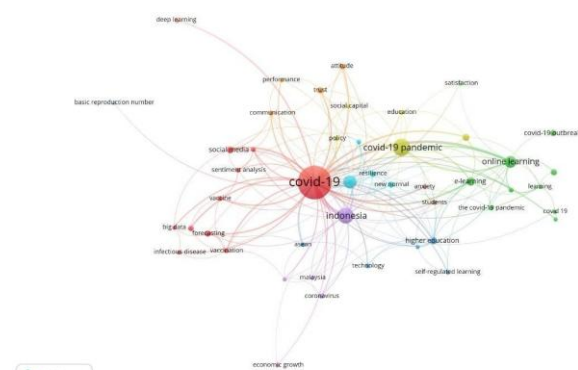


Fig. 4. Research Trend Map Visualization

Figure 4 is a visualization of research trends. This figure uses 2,343 keywords, the minimum number of keywords used is 5, resulting in 47 thresholds. The threshold number shows that 47 keywords that meet the criteria appear more than 4 times. From the results of the visualization, 12 clusters are generated. The first cluster consists of big data, covid-19, forecasting, infectious disease, machine learning, sentiment analysis, social media, twitter, vaccination, and vaccine; the second cluster consists of covid-19,

covid-19 outbreak, e- learning, elementary school, learning, local wisdom, online learning, pandemic covid-19, the covid-19 pandemic; the third cluster contains ASEAN, emergency remote learning, higher education, self-regulated learning, and technology; the fourth cluster consists of the covid-19 pandemic, distance learning, education, policy, and social capital; the fifth cluster contains coronavirus, Indonesia, Malaysia, Southeast Asia; the sixth cluster consists of government, new normal, pandemic, and resilience; the seventh cluster consists of attitude, communication, performance, trust; the eighth cluster consists of anxiety and students; the ninth cluster consists of economic growth; the tenth cluster consists of deep learning; the eleventh cluster of satisfaction; the twelfth cluster consists of the basic reproduction number.

If examined, the first cluster relates to research on COVID-19 big data that was studied with social media, the second cluster has a topic of discussion about the impact of COVID-19 in learning, especially for elementary school. The learning uses online learning with the help of e-learning. The third cluster relates to technology in higher education. The fourth cluster discussed a lot of policies that occurred during the pandemic. The fifth cluster relates to countries or areas affected by Covid around Indonesia. The sixth cluster discusses the government's new normal policy. The seventh cluster discussed attitudes, communication, performance, and trust that occurred during the pandemic. Meanwhile, the next clusters discussed the anxiety that occurred during COVID-19, economic growth, and so on.

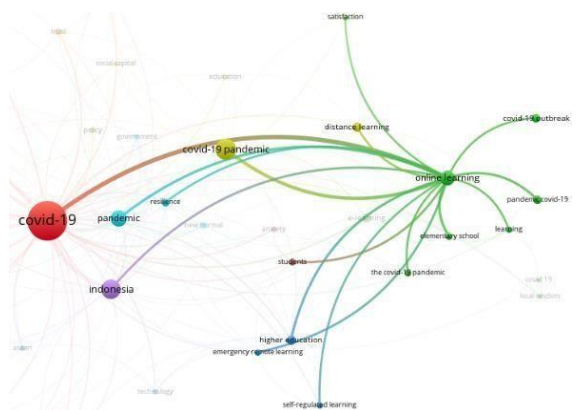


Fig. 5. Visualization of Research Trend Map with Keywords Online Learning

Several points in Figure 4 explain that the trend of topics that are highlighted in this research on COVID-19 is online learning. When viewed from Figure 5, several studies that discuss COVID-19 and online learning also discuss satisfaction, distance learning, students, elementary school, and higher education. This shows that researchers from Indonesia have highlighted many educational issues that took place

during COVID-19. (Fauzi et al., 2021) evaluates the use of e-learning platforms among students at universities located in West Sumatra, Indonesia, during the COVID-19 pandemic. Another title that can be used as an example is “E-learning and academic performance during COVID-19: The case of teaching integral calculus” (Ramdani et al., 2021). This research analyzes the correlation between self-efficacy, creativity perception, and productive disposition towards academic performance. The results showed a correlation between self-efficacy and creativity perception with regard to productive disposition.

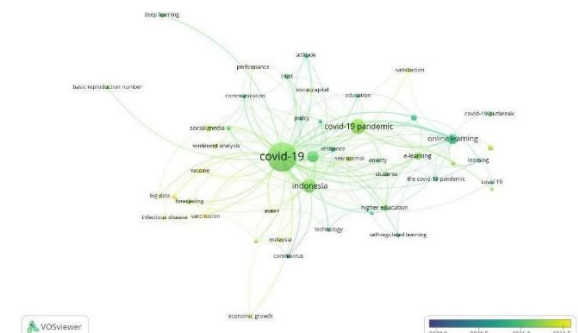


Fig. 6. Overlay Visualization by Year

According to Figure 6, research that conducted in 2020, is marked in blue. Research with the keywords COVID-19, pandemic, COVID-19 pandemic, Indonesia, and others in green has been published in 2021. At the same time, the yellow color presented signifies that the article has been published around 2022.

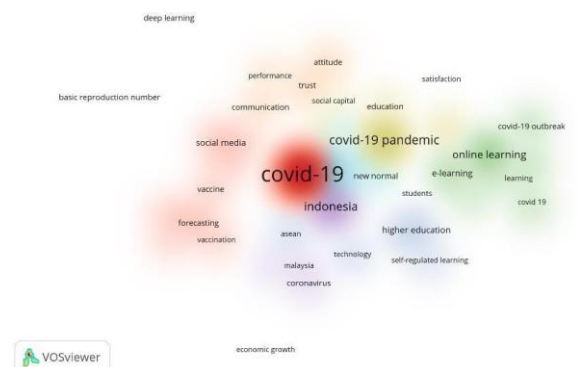


Fig. 7. Density Visualization Based on Cluster

Figure 7 shows that keywords are grouped with certain colors based on clusters as in Figure 4. The red color shows the first cluster consisting of big data, covid-19, forecasting, infectious disease, machine learning, sentiment analysis, social media, Twitter, vaccination, and vaccine; the second green cluster consisting of covid-19, covid-19 outbreak, e-learning, elementary school, learning, local wisdom, online learning, pandemic covid-19, the covid-19 pandemic; etc. The larger the text, the more often that keyword appears to be a keyword in a research.

4. Conclusion

Based on the results of the explanations and analysis that have been presented, it can be concluded that research with the key word COVID-19 is related to the subject area of the healthsector. If the keywords related to the medical field are eliminated, it can be found that the research trend in Indonesia when it comes to COVID-19 are mainly focused on the topic of education; more specifically, as can be seen in the second cluster, the discussion of online learning that took place during the COVID-19 pandemic. In addition to that, the third cluster also discusses the e-learning that used by higher education during the pandemic.

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