Analytical Research Focus Areas of Disaster: Case Study
SCOPUS 2014-2018

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Abstract. Higher education is one of the most critical educational stages in a country. Most experts in various fields become proficient through higher education. Therefore, higher education providers or colleges should improve their education quality continuously. One of the ways to improve their quality is by college excellence mapping. This paper uses data retrieved from Scopus for the observation period from 2014 to 2018. Furthermore, to identify the most productive and influential institutes and higher education. As a center of education, as well as the research center, one that can be used as a mapping base is scientific publication. In this study, the excellence that is want to be seen refers to RPJPN 2005-2025 and RPJMN 2015-2019 and mapping based on the journal in SCOPUS 2014-2018, which is focused on Disaster. Results from this study concluded that 94.2 % (211) of 224 universities published journals indexed Scopus on range 1-42 journal publications within 5 years.

1. Introduction

Research is a systematic, controlled, empirical and critical investigation of a hypothetical proposition regarding certain relationships between phenomena [1]. Whereas [2] defines research as a systematic attempt to find a scientific answer to a problem (a systematic attempt to provide the answer to the question). Systematic means following certain procedures or steps. The scientific answer is the formulation of knowledge, generalization, in the form of theories, both abstract and concrete principles formulated through primary tools, namely empirical and analysis. The research itself works based on assumptions, techniques, and methods. According to the Law of the Republic of Indonesia Number 12 of 2012, Higher education is a level of education after secondary education which includes diploma programs, undergraduate programs, master's programs, doctoral programs, and professional programs, as well as specialist programs, which are organized by universities based on Indonesian culture [3]. In its implementation, the Ministry of Research and Technology established the vision for 2015 - 2019 for "The realization of quality higher education and the ability of science and technology and innovation to support the nation's competitiveness". Trends in research trends in scientific publications always change from time to time.

Changes occur sometimes follow the pattern of events and facts on the ground. As for some of the focus areas in research are Food-Agriculture; Energy - New and Renewable Energy; Health - medicine; Transportation; Information and communication technology; defense and security; Advanced Material; Maritime affairs; Disaster; Social and Cultural Arts - Basic Sciences that can be
used to improve the welfare of society and enhance the competitiveness of a country and this paper

discuss about disaster.

According to the Law of the Republic of Indonesia Number 24 of 2007, Disasters are events or a
series of events that threaten and disturb life and livelihood society caused, both by natural factors
and / or non-natural factors as well human factors, so that it results in human casualties, damage the
environment, property losses, and psychological impact [4]. in terms of geology, Indonesia is
divided into a meeting between three active tectonic plates namely the Indo-Australian plate
Eurasian plate and Pacific plates. So, we must ready for another risk.

The concept of risk is a central issue in environment and disaster [5]. On the other hand, this risk
is uncertain, it can be the consequences are uncertain, and may leave us better or worse off.
Uncertainty often leads people to depend on others to provide information. These others can be
scientists and other people who share or contest their interests and values [6], [7], [8], [9]. So, the
quality of relationships with these others influences how they deal with uncertainty is interpreted
from actions are chosen [10].

2. Methodology

The data used in this study are secondary, obtained from the Ministry of Research and Technology.
In this study the data collected from Scopus in 2014 - 2018.

2.1. Collecting data

The data were collected from KEMENRISTEKDIKTI in scientific publications focus on the
disaster. The search covers the journal published from 2014 until 2018. In the beginning, the study
uses the keywords “Disaster”. The initial search keywords were limited to the title of the paper and
the keywords.

2.2. Identify Scopus data based on areas of focus disaster

The initial search keywords were limited to the title of the journal and the keywords. At first, 2,390
papers were derived using those combinations of keywords and the specific keywords to disaster.

2.3. Data analysis using a frequency distribution

Data from all universities that publish journals with a focus on disaster were analyzed using
frequency distribution. Frequency distribution is useful to see the class division for universities that
send the most journals in the 2014-2018 range on Scopus. Formula that frequency distribution is used
in determining the class of journal publications such as 1) determine the range of data, 2) determine
the classes, 3) determine the class interval.

Determine the range of data using the largest value and the smallest value. The data range is the
result of the difference between the largest value and the smallest value of the existing data [11].

\[ R = X_{max} - X_{min} \]  

Where \( R \) is the data range; \( X_{max} \) is the largest value of the data; \( X_{min} \) is the smallest value of the
data. Sturges rules can be used in determining many classes. Sturges rules in this research
methodology use a total of data.

\[ K = 1 + 3.322 \log(n) \]  

Where \( K \) is the total of classes; \( n \) is the total of data. Determine the class interval or commonly called
class length is the result of the difference from the largest data value minus the smallest data value
then divided by the total of classes.

\[ P = \frac{X_{\text{max}} - X_{\text{min}}}{1 + 3.322 \log(n)} \]  

\( P \) = Class Length  
\( R \) = Range  
\( K \) = Classes

Where \( X_{\text{max}} \) is the largest value of the data; \( X_{\text{min}} \) is the smallest value of the data; \( n \) is the total of data.

2.4. Results and discussion

In this section, the results of the analysis get a university frequency distribution table that describes the number of disaster scientific publications during the period 2014-2018 on Scopus. Higher Education with the highest number of scientific publications will be compared in the results of research Quantitative by counting publications on the most sub-focus.

2.5. Conclusions

In this section, the study included 2390 journals from KEMENRISTEKDIKTI database analysis, as well as the top 3 most universities, present the sub-focus or promote their expertise in specific fields in disaster. The study confirms that the data are derived from reliable sources.

3. Analysis

3.1 Frequency distributions

Table 1 explains the frequency distribution of a total of 224 university in terms of publishing publications in Scopus in 2014-2018. On the range "337 - 378" there is one university in the spotlight the main focus in publications on disaster is Bandung Institute of Technology (ITB) with a total publication of 374 papers. On the range of "169-210", the most widely publicized publication about the focus of the disaster was Gadjah Mada University (UGM) with a total of 208 papers. On the "169 - 210" interval, the most widely published scientific publication about the focus of the disaster was the University of Indonesia (UI) with a total of 161 papers. It can also be concluded that there are significant differences from each university in producing scientific publications on disaster focus.

| No | Interval | Frequency | Percentage |
|----|----------|-----------|------------|
| 1. | 1 – 42   | 211       | 94.2       |
| 2. | 43 – 84  | 6         | 2.7        |
| 3. | 85 – 126 | 3         | 1.3        |
| 4. | 127 – 168| 2         | 0.9        |
| 5. | 169 – 210| 1         | 0.4        |
| 6. | 211 – 252| 0         | 0.0        |
| 7. | 253 – 294| 0         | 0.0        |
| 8. | 295 – 336| 0         | 0.0        |
| 9. | 337 - 378| 1         | 0.4        |
| TOTAL | | 224 | 100 |

3.2. Publication by journal on ITB

Table 2 shows the published specifications of a journal with the Scopus index in Bandung Institute
of Technology (ITB) with a total of 374 publications in the disaster-focused journal publications. The first and second highest publications were "Geological Disaster Technology and Management" and "Technology and Disaster Management of Earthquakes, Tsunamis, Floods, Landslides, Droughts, Volcanic Eruptions" with 126 and 106 journal publications. The third and fourth highest publications were "Technology and Environmental Management" and "Mitigation, Climate Change and Ecosystem Orders" with 44 and 34 journal publications. The fifth and sixth highest publications were "Continuous Mitigation of Natural Disasters" and "Hydrometeorological Disaster Technology and Management" with 26 and 24 journal publications. Publications with the seventh and eighth highest sub-focus are "Catastrophic Technology Failure" and "Technology and Disaster Management of Land and Forest Fires" with 9 and 3 journal publications. The least is "Social Disaster" with the number of 2 journal publications.

Table 2. Publications by journal on ITB

| University | Number of Publications | Research Focus | Number of Research Focus |
|------------|------------------------|----------------|--------------------------|
| ITB        | 374                    | Catastrophic Technology Failure | 9 |
|            |                        | Social Disaster | 2 |
|            |                        | Continuous Mitigation of Natural Disasters | 26 |
|            |                        | Mitigation, Climate Change, and Ecosystem Order | 34 |
|            |                        | Technology and Disaster Management of Earthquakes, Tsunamis, Floods, Landslides, Droughts, Volcanic Eruptions | 106 |
|            |                        | Geological Disaster Technology and Management | 126 |
|            |                        | Hydrometeorological Disaster Technology and Management | 24 |
|            |                        | Technology and Disaster Management of Land and Forest Fires | 3 |
|            |                        | Technology and Environmental Management | 44 |

3.3. Publication by journal on UGM

Table 3 shows the published specifications of a journal with the Scopus index in Gadjah Mada University (UGM) with a total of 208 publications in the disaster-focused journal publications. The first and second highest publications were "Technology and Disaster Management of Earthquakes, Tsunamis, Floods, Landslides, Droughts, Volcanic Eruptions" and "Geological Disaster Technology and Management" with 80 and 49 journal publications. The third and fourth highest publications were "Technology and Environmental Management" and "Continuous Mitigation of Natural Disasters" with 20 and 17 journal publications. The fifth and sixth highest publications were "Hydrometeorological Disaster Technology and Management" and "Mitigation, Climate Change and Ecosystem Order" with 17 and 13 journal publications. Publications with the seventh and eighth highest sub-focus are "Social Disaster" and "Technology and Disaster Management of Land and Forest Fires" with 5 and 4 journal publications. The least is "Catastrophic Technology Failure" with the number of 3 journal publications.
Table 3. Publications journal on UGM

| University | Number of Publications | Research Focus                                      | Number of Research Focus |
|------------|------------------------|-----------------------------------------------------|--------------------------|
| UGM        | 208                    | Catastrophic Technology Failure                      | 3                        |
|            |                        | Social Disaster                                      | 5                        |
|            |                        | Continuous Mitigation of Natural Disasters          | 17                       |
|            |                        | Mitigation, Climate Change, and Ecosystem Order     | 13                       |
|            |                        | Technology and Disaster Management of Earthquakes, Tsunamis, Floods, Landslides, Droughts, Volcanic Eruptions | 80                       |
|            |                        | Geological Disaster Technology and Management       | 49                       |
|            |                        | Hydrometeorological Disaster Technology and Management | 17                       |
|            |                        | Technology and Disaster Management of Land and Forest Fires | 4                        |
|            |                        | Technology and Environmental Management              | 20                       |

3.4. Publications by journal on UI

Table 4 shows the published specifications of a journal with the Scopus index in the University of Indonesia (UI) with a total of 161 publications in the disaster-focused journal publications. The first and second highest publications were "Technology and Environmental Management" and "Technology and Disaster Management of Earthquakes, Tsunamis, Floods, Landslides, Droughts, Volcanic Eruptions" with 47 and 37 journal publications. The third and fourth highest publications were "Mitigation, Climate Change and Ecosystem Orders" and "Geological Disaster Technology and Management" with 20 and 18 journal publications. The fifth and sixth highest publications were "Hydrometeorological Disaster Technology and Management" and "Continuous Mitigation of Natural Disasters" with 16 and 9 journal publications. Publications with the seventh and eighth highest sub-focus are "Technology and Disaster Management of Land and Forest Fires" and "Catastrophic Technology Failure" with 6 and 5 journal publications. The least is "Social Disaster" with the number of 3 journal publications.

Table 4. Publications by journal on UI

| University | Number of Publications | Research Focus                                      | Number of Research Focus |
|------------|------------------------|-----------------------------------------------------|--------------------------|
| UI         | 161                    | Catastrophic Technology Failure                      | 5                        |
|            |                        | Social Disaster                                      | 3                        |
|            |                        | Continuous Mitigation of Natural Disasters          | 9                        |
|            |                        | Mitigation, Climate Change, and Ecosystem Order     | 20                       |
|            |                        | Technology and Disaster Management of Earthquakes, Tsunamis, Floods, Landslides, Droughts, Volcanic Eruptions | 37                       |
|            |                        | Geological Disaster Technology and Management       | 18                       |
4. Conclusion

From the results of the analysis, it can be concluded that there is a significant gap between the university. So that it can cause imbalances in the level of education in some areas as well as giving rise to people's views of the Higher Education with various perspectives. Therefore, it is necessary to increase the efforts of higher education with the Government to create an increase in the quality of Higher Education, enrichment materials for learning science and technology, the advancement of national civilization, fulfillment of national strategic needs, and the movement of communities developing human resources.

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