Descriptive Analysis Using a Frequency Distribution to Determine the Highest Number of Publication In Focus Area of Defense and Security

N Sutrisno, W Ashadi, H F Tanjung and A K Tyas

1 Department of Law, Islamic University of Indonesia
2 Department of Psychology, Islamic University of Indonesia
3 Department of Communication Studies, Islamic University of Indonesia
4 Department of Statistics, Islamic University of Indonesia

Abstract. This study investigated scientific research on mapping the strength of Defence and Security focus research BASED on the 2014-2018 Scopus data. The Ministry of Research Technology and (KemenristekDIKTI), especially the Directorate General of Research and Development (RISBANG), has a significant role in improving the quality of higher education. One way to improve higher education quality is through mapping the strengths of research. The advantage of the study that forms the basis of this mapping refers to RPJPN 2005-2025 and RPJMN 2015-2019, which focuses on Defence and Security. This study used three steps methodology; (1). Collecting Data were collected from subsequent Scopus data year 2014-2018 from KemenristekDIKTI in scientific publication focus on Defence and Security, (2) identifying Scopus data based on sub-focus of Defence and Security, (3). Data analysis using frequency distribution (Determine the range of data, determine the classes, and determine the class interval). This study concluded that 90.4 % (75) of 83 universities published journals indexed Scopus on range 1-6 journal publications within five years. UI (University of Indonesia) has the most journal publications of Defence and Security focus.

1. Introductions
To ensure the quality of higher education, higher education national establish the standard. National research standards are used to measure a variety of research activities. This standard is also used as a minimum performance measure for research activities carried out by universities in Indonesia. There are rules on the minimum results that must be achieved for each research activity. Higher Education is obliged to organize research, community service, and education [1]. Research in Higher Education is directed at developing science and technology, as well as improving the welfare of the competitiveness of people and nations. The results of the research must have benefits for the enrichment and learning of science and technology, improvement of the quality of higher education and advancement of increasing independence, nation's civilization, progress, and competitiveness of
of the country, meeting the strategic needs of national development, and transforming communities into knowledge-based societies [2].

Of the many universities in Indonesia, each tries to promote and demonstrate its superiority. The benefits shown are only limited to one side by the relevant PT and are not based on sound reason. However, not all universities apply like that. To ensure that universities in focus areas, further research is needed, including mapping. The mapping results can provide information about how many universities publish leading international journals (indexed by Scopus). On 2017-2045 National Research Master Plan (RIRN) is ready to improve the efficiency and effectiveness of implementation, especially among Ministries / Institutions, to align long-term research needs with the direction of national development related to science and technology. There are ten studies focused on RIRN. Areas of focus mean including Food-Agriculture; Energy - New and Renewable Energy; Health - medicine; Transport; Information and communication technology; defense and security; Advanced material; marine; Disaster and Social Humanities - Cultural Arts - Education. However, the parameters to determine the advantages of PT are not only seen from leading international journals (indexed Scopus) can also be seen from several other publications that are not contained in this study.

Defense and security are some of the most critical areas of focus mapping. This activity is due to the condition of Indonesia, which needs methods and strategies for proper regional security for national defense. The task of protecting the Nation and the State of Indonesia as an archipelago shows enormous challenges and impacts on the development demands of a country that produces strong resilience. The 21st century noted an increase in the phenomenon of globalization of the defense industry which had strengthened since the 1970-1980s. This was marked by the occurrence of significant trends in the cooperation intensity of the countries in the world in developing their defense industry. Even the United States as the country with the largest defense budget in the world is also globalizing the defense industry by liberalizing the defense industry. Defense industry interactions between countries in this case are becoming increasingly complex [3].

For the sake of the pilot, it can be seen from the superpower which is holding multilateral cooperation in the procurement of weapons, in order to realize defense liberalization and expand influence. Defense liberalization is an appropriate concept used to describe this collaboration, with a greater political content [4]. This can be seen from the F-35 Joint Strike Fighter project, the procurement of drones or unmanned aircraft has become one of the procurement that has a broad impact both in economic and political terms. UAV (Unmanned Aerial Vehicle) is a technology that was born ten years after the discovery of the plane by the Wright brothers (1913) [5]. Government involvement that can be said 'indirectly' to the economy is a tool that justifies the operation of neoliberal governance [6]. Therefore, politics is considered as one of the failure factors in creating efficiency (the science of political failure). This is because the consideration of partner selection is not based entirely on comparative and competitive advantages and objective economic criteria. This further confirms that collaboration between countries will always be in a state of inefficiency because of its political certainty [7].

National defense strategies are used to address Indonesia's security, but it is not easy to determine the impact of national defense policies. In theory, national defense policy with its threats "threats are not the most important influence in the development of the armed forces of [Southeast Asia] countries: long-term, non-threat factors in general are far more significant." [8]. Some neighboring countries have responded to the problem of maritime security through the development of naval capabilities, Indonesia has only taken limited steps, due to lack of funds, to increase its naval capabilities, with an emphasis on securing vital sea lanes, especially Sundanese. Malacca Strait and Lombok due to longstanding piracy problems and possible terrorist attacks [9]. As civil society, we must defend. This is reinforced by the concept "This concept is strengthened in post-Cold War because it is based on the belief that in the post-cold war, the possibility of open and conventional war is impossible in the future [10].

In maintaining defense and security, there needs to be an increase in the budget to run well and be
assured. Policies to increase or increase the military budget are strongly influenced by domestic economic factors, namely economic growth [11]. Research on the mapping of research strengths in the field of defense and security focus is very beneficial for Kemenristekdikti, particularly the Director-General of Research and Development, in developing strategic policies, particularly in the area of defense and security focus. The results of this study are manuscripts that can be used as one of the considerations in determining policy recommendations for an issue by the focus areas of defense and security.

In this study, researchers used a frequency distribution to map the focus areas of Defense and Security. The frequency distribution is the arrangement of numerical data according to magnitude (quantity) or by category (qualitatively) [12]. The advantage of using a frequency distribution is that the data is presented in certain classes or groups together with the corresponding frequencies. It is hoped that this research can be useful for Kemenristekdikti, especially the Director-General of Research and Development, in developing strategic policies, specifically in the area of Defense and Security focus. The results of this study are manuscripts that can be used as one of the considerations in determining policy recommendations for an issue by the focus areas of Defense and Security.

2. Methodology
The data used in this study are secondary, namely the Scopus data for 2014 - 2018 obtained from the Ministry of Research and Technology. The population in this study is the data collection of Scopus in 2014 - 2018. The sample taken in this study is the Scopus data of the Defense and Security Focus Areas in 2014 - 2018.

2.1 Collecting data
The data were received from KEMENRISTEKDIKTI in scientific publications focus on Defense and Security. The search covers the journal published from 2014 until 2018. In the beginning, the study uses the keywords "Defense and Security." 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 in defense and security
The initial search keywords were limited to the title of the journal and the keywords. At first, 353 papers were derived using those combinations of keywords and the specific keywords to defense and security.

2.3 Data analysis using a frequency distribution
Data from all universities that publish journals with a focus on defense and security were analyzed using frequency distribution. The frequency distribution is useful to see the class division for universities that send the most journals in the 2014-2018 range on Scopus. The formula that frequency distribution is used in determining the class of journal publications such as 1) determine the scope of data, 2) determine the categories, 3) determine the class interval.

Determine the range of data using the most significant value and the smallest value. The data range is the result of the difference between the most considerable importance and the lowest amount of the existing data [3].

\[ R = X_{\text{max}} - X_{\text{min}} \]  
(2.1)

\( R \) = Range  
\( X_{\text{max}} \) = Largest value  
\( X_{\text{min}} \) = Smallest value

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

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

(2.2)

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 most significant data value minus the smallest data value then divided by the total of classes

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

(2.3)

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.

3. Results and Discussion

The data used for mapping the strength of research in the focus area in this study is secondary data which is a collection of reputable journal indexed data for Scopus in 2014-2018. The journal data collection covers 11 research focus areas namely Food - Agriculture, Energy - New and Renewable Energy, Health - medicine, transportation, Information and Communication Technology, defense and security, Advanced Materials, Maritime, Disaster, Social and Cultural Arts, and Science. The basis, while in this study only focuses on a collection of journals in the field of defense and security as many as 353 journals.

Based on available data, a university mapping is then made based on the number of journal publications in the area of defense and security focus. The mapping uses frequency distribution where the interval is the number of journal publications and the frequency is the number of tertiary institutions. The results of the mapping are as follows:

| No | Interval | Frequency | Percentage |
|----|----------|-----------|------------|
| 1. | 1-6      | 75        | 90.4       |
| 2. | 7-12     | 1         | 1.2        |
| 3. | 13-18    | 1         | 1.2        |
| 4. | 19-24    | 2         | 2.4        |
| 5. | 25-30    | 1         | 1.2        |
| 6. | 31-36    | 0         | 0.0        |
| 7. | 37-42    | 2         | 2.4        |
| 8. | 43-48    | 1         | 1.2        |
| Total | | 83       | 100        |

Table 1 shows that there are 83 tertiary institutions that publish reputable journals indexed as a focus area for defense and security. The mapping shows that around 90.4% of tertiary institutions in Indonesia still publish reputable scopus indexed journals in the range of 1-6 journals. While there is only 1 tertiary institution that publishes journals in the high range of 43-48 journals. This can be interpreted that there is still a very clear inequality that is seen in relation to the number of reputable journal publications indexed by university scopus in Indonesia. The following are the three universities with the highest number of scopus indexed reputable journal publications along with research sub-focus areas of defense and security focus:
Table 2. Higher education with the most number of publications

| Ranking | University | Number of Publications | Research Focus                                      | Number of Research Focus |
|---------|------------|------------------------|-----------------------------------------------------|--------------------------|
| 1       | UI         | 46                     | Supporting motion technology                         | 23                       |
|         |            |                        | Technology to help the explosive power               | 0                        |
|         |            |                        | Defense and security technology                      | 23                       |
|         |            |                        | Supporting motion technology                         | 2                        |
| 2       | LIPI       | 41                     | Technology to help the explosive power               | 1                        |
|         |            |                        | Defense and security technology                      | 38                       |
|         |            |                        | Supporting motion technology                         | 1                        |
| 3       | ITB        | 38                     | Technology to help the explosive power               | 7                        |
|         |            |                        | Defense and security technology                      | 30                       |

Table 2 shows that University of Indonesia (UI) are the highest number of publications with scopus indexed reputable journals in the amount of 46 publications with the highest research theme supporting motion technology (23) and defense and security technology (23). Indonesian Institute of Sciences (LIPI) is a research institution which has the second highest scopus indexed journal publication after UI, which is 41 publications with the highest research theme defense and security technology (38). While the third order is the Bandung Institute of Technology (ITB), which is 38 publications with the highest research theme defense and security technology (30).

Based on table 1 and table 2 it can be seen that there is still a very clear imbalance seen in the number of reputable journal publications indexed by university scopus in Indonesia. It is therefore expected that the government can develop a policy regarding the quality and quantity of a publication journal. The government can make a minimum limit of a university in publishing journals so that universities are competent in meeting the established standards. Furthermore, the government can also give more appreciation to universities that already have a high number of journal publications in the category so that they can maintain and even improve the quality and quantity of journal publications.

4. Conclusion

Based on the results and analysis above, it can be concluded that UI has the highest number of journal publications in the amount of 46 journals, LIPI ranks second in the amount of 41 journals and ITB ranks third in the amount of 38 journals. Of the three tertiary institutions and research institutions, the highest overall research theme was defense and security technology.

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