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## Publikasi Pembelajaran Mandiri Dalam Pendidikan: Analisis Bibliometrik

### Publication Of Self-Regulated Learning In Education: A Bibliometric Analysis

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#### Abstrak:

Penelitian ini bertujuan untuk menganalisis artikel jurnal internasional tentang *self-regulated learning* dalam pendidikan yang diterbitkan pada tahun 2018 hingga 2022. Penelitian ini berfokus pada identifikasi tren publikasi, jurnal penting, artikel yang berpengaruh, serta topik penelitian yang umum terkait *self-regulated learning*. Metode *systematic mapping* digunakan dalam empat tahap. Pertama, artikel yang relevan dikumpulkan menggunakan aplikasi Publish or Perish yang terhubung dengan basis data Scopus. Kedua, artikel dikelompokkan untuk analisis bibliometrik. Ketiga, metadata artikel diperiksa dan dilengkapi. Terakhir, data dianalisis menggunakan aplikasi VOSviewer. Hasil penelitian menunjukkan beberapa temuan penting. Pertama, jumlah publikasi mengenai *self-regulated learning* mengalami perubahan dari tahun ke tahun selama periode lima tahun. Kedua, sepuluh jurnal paling produktif menerbitkan 142 artikel yang berkaitan dengan topik ini. Ketiga, sepuluh artikel yang paling banyak disitasi memperoleh total 838 sitasi, yang menunjukkan tingginya minat terhadap bidang penelitian ini. Keempat, kata kunci yang paling sering digunakan adalah “*self-regulated learning*,” “*education*,” dan “*student*.” Selain itu, bidang ilmu sosial memiliki jumlah publikasi terbanyak, diikuti oleh ilmu komputer, psikologi, dan teknik. Jenis publikasi yang paling umum adalah artikel jurnal, makalah konferensi, bab buku, dan artikel ulasan. Peneliti dari berbagai negara dan disiplin ilmu telah berkontribusi dalam penelitian tentang *self-regulated learning*. Penelitian ini menekankan perlunya penelitian lebih lanjut, khususnya dalam pendidikan sains, karena regulasi diri penting untuk mendukung proses ilmiah, pengetahuan ilmiah, dan sikap ilmiah dalam pembelajaran.

**Kata Kunci:** Tren Publikasi; Pembelajaran Mandiri; Pendidikan

**Abstract:** *This study aims to analyze international journal articles about self-regulated learning in education published between 2018 and 2022. The research focuses on identifying publication trends, important journals, influential articles, and common research topics related to self-regulated learning. A systematic mapping method was used in four stages. First, relevant articles were collected using the Publish or Perish application connected to the Scopus database. Second, the articles were grouped for bibliometric analysis. Third, the metadata of the articles were checked and completed. Finally, the data were analyzed using the VOSviewer application. The results showed several important findings. First, the number of publications on self-regulated learning changed from year to year during the five-year period. Second, the ten most productive journals published 142 articles related to this topic. Third, the ten most cited articles received a total of 838 citations, showing the strong interest in this research area. Fourth, the most frequently used keywords were "self-regulated learning," "education," and "student." In addition, social sciences had the largest number of publications, followed by computer science, psychology, and engineering. The most common publication types were journal articles, conference papers, book chapters, and review papers. Researchers from many countries and academic disciplines have contributed to studies on self-regulated learning. This study highlights the need for further research, especially in science education, because self-regulation is important for supporting scientific processes, scientific knowledge, and scientific attitudes in learning.*

**Keywords:** *Publication Trends; Self-Regulated Learning; Education*

## INTRODUCTION

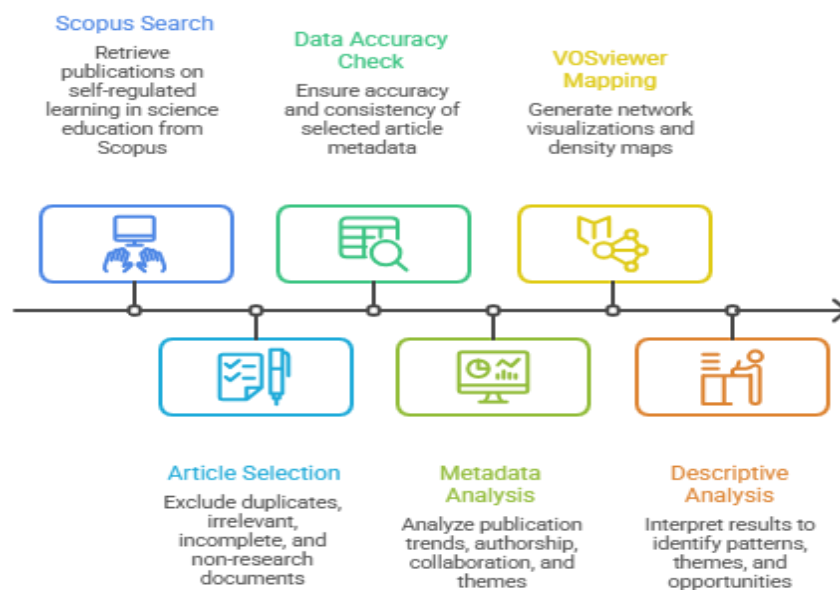
The national education goals, as stated in Republic of Indonesia Law Number 20 of 2003 on the national education system, Article 3, are to provide education so that every individual can become a person who is "faithful and devoted to the One Almighty God, noble in character, healthy, knowledgeable, skilled, creative, independent, and responsible citizens" (Noor, 2018). Ryan and Deci (2000) suggest that educators need to focus on providing a learning environment and learning processes that enable children to strengthen and develop their intrinsic motivation. The advancement of technology allows for diverse learning experiences today, which highlights the importance of students' self-regulation skills. It has been found that better performance can be achieved through consistency during learning (Hsu et al., 2023). Emotional instability is evident as students move towards better self-regulation in a new learning environment (Bowman, 2017). Therefore, teachers must be able to motivate students to enhance their self-awareness and recognize their potential, responsibilities, and intrinsic values within themselves. This enables students to regulate themselves. Self-regulation refers to an individual's

belief in the efficacy of how they can execute self-regulation mechanisms such as self-observation, self-assessment, and self-response (Kim, 2020). Self-regulation skills seem to be important for students to lead competent and independent lives in this era (Manso-Vázquez et al., 2016; Ozer & Yukselir, 2021). In self-regulated learning, time management becomes a crucial skill in determining how well one can allocate time. There are still many works that emphasize the importance of self-regulation in learning. Therefore, the objective of this article is to identify articles related to self-regulated learning in science education based on author, subject area, and publication trends in the past five years, from 2018 to 2022. Based on this, several questions arise for the author:

- Which journals discuss self-regulated learning in science education the most?
- How many publications focus on self-regulated learning in science education?
- How many articles on self-regulated learning are cited by other researchers in science education?
- Who are the most consistent authors in discussing self-regulated learning in science education?

## METHOD

This study employed a bibliometric research design to analyze publication trends related to self-regulated learning in science education over the last five years. Bibliometric analysis was used to provide a systematic, comprehensive, and quantitative overview of the development of scientific publications, research productivity, collaboration networks, and thematic trends within the selected research area. The study mainly applied a quantitative approach in collecting and analyzing publication data; however, several qualitative considerations were also incorporated during the filtering, verification, and interpretation stages. As shown in Figure 1 below:



**Figure 1.** Bibliometric Research Procedure for Self-Regulated Learning in Education

The research procedure consisted of several stages, as seen in Figure 1. First, the data collection process was conducted by searching scientific publications indexed in the Scopus database. The search utilized relevant keywords and Boolean operators related to “self-regulated learning” and “Education.” The search was limited to publications published within the last five years to ensure the relevance and recency of the analyzed data.

Second, the retrieved articles underwent a screening and filtering process. Duplicate documents, irrelevant publications, incomplete records, and non-research documents were excluded based on predetermined inclusion and exclusion criteria. Subsequently, the selected articles were verified to ensure data accuracy and consistency before further analysis.

Third, the bibliometric analysis process was carried out using metadata obtained from the database. The analysis focused on publication trends, authorship productivity, institutional and country contributions, citation analysis, co-authorship networks, keyword co-occurrence, and thematic mapping. The processed data were then exported into visualization software, particularly VOSviewer, to generate network visualizations and density maps illustrating relationships among authors, countries, institutions, and research topics.

Finally, the results of the bibliometric analysis were interpreted descriptively to identify the development patterns, dominant themes, collaboration structures, and research opportunities in studies concerning self-regulated learning in science education. Through this procedure, the study aimed to provide a comprehensive understanding of the evolution and research landscape of self-regulated learning within the field of science education.

## RESULTS AND DISCUSSION

### Trends in Self-Regulated Learning Publications in Education

The analysis of publication trends on self-regulated learning in education shows a relatively fluctuating pattern over the years. The data analyzed by the author consists of the total indexed publications in Scopus from 2018 to 2022, with a total of 352 publications. The highest number of publications was recorded in 2021 with 83 articles, while the lowest was in 2018 with 54 articles. Since then, the publication rate on self-regulated learning has been increasing year by year, as shown in the graph below:

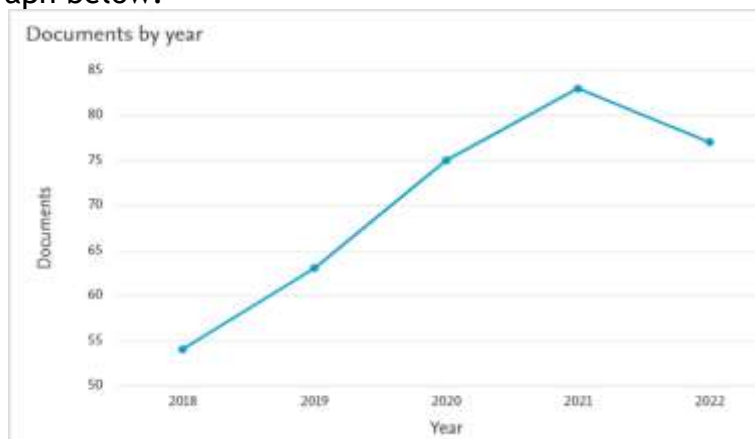


Figure 2. Publication trends from year to year

The increase in publications each year can be attributed to various factors, such as organizational size, organizational requirements, incentive structures, reputation, and human psychological mechanisms like intrinsic reward preferences (Kwiek, 2015, 2016; Leisyte et al., 2012). Additionally, publication trends also reflect the development direction and interests of authors in their respective fields (Drysdale et al., 2013; Halverson et al., 2012; McDonough et al., 2017).

### Most-discussed Journals on Self-Regulated Learning

Out of 142 journals publishing articles on self-regulated learning, the author selected the top 5 journals based on the number of articles published in the last 5 years. These journals are: "Computers and Education" with 15 articles; "Lecture Notes in Computer Science, Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics" with 13 articles; "Journal of Physics Conference Series" with 8 articles; "Frontiers in Psychology" with 6 articles; and "Computers in Human Behavior" with 5 articles. Therefore, these five journals collectively published 51 articles, as depicted in the graph below:

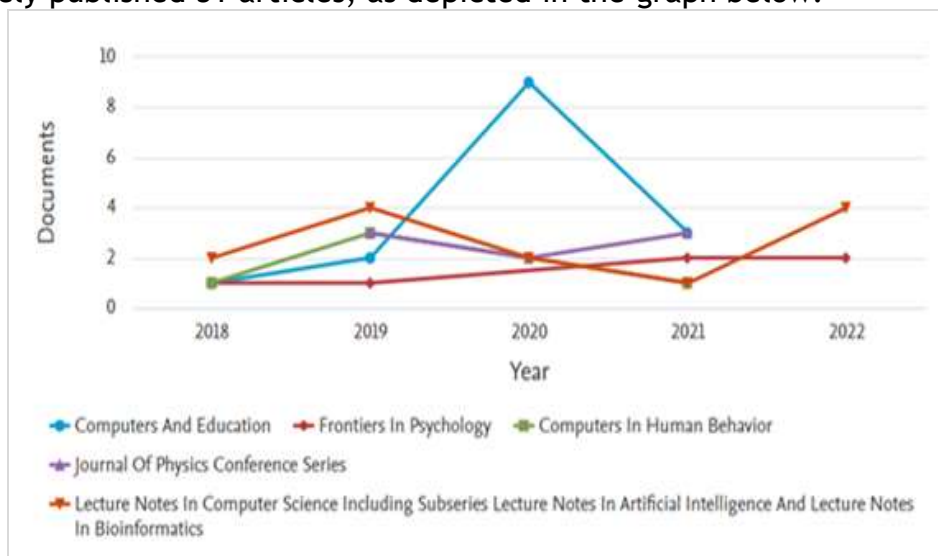
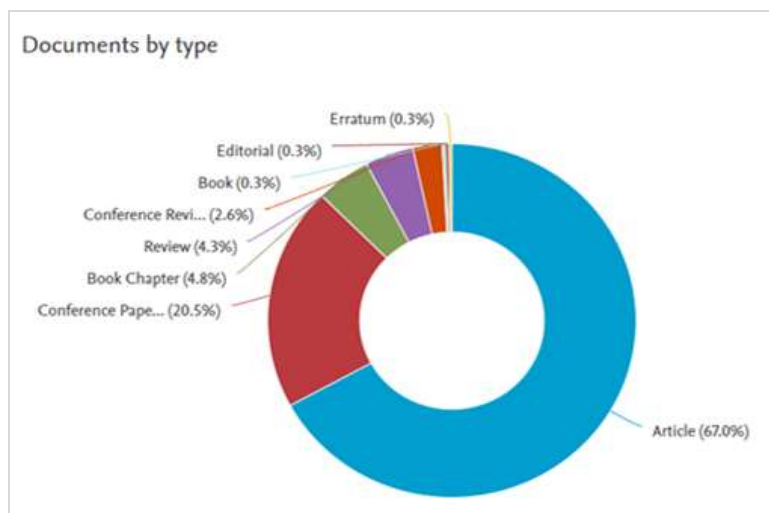


Figure 3. Journals publishing on self-regulated learning

Out of the 352 published articles, the majority (236, or 67%) were in the form of articles, followed by 72 conference papers, 17 book chapters, 15 reviews, and a few others. For a clearer picture, refer to Figure 4:

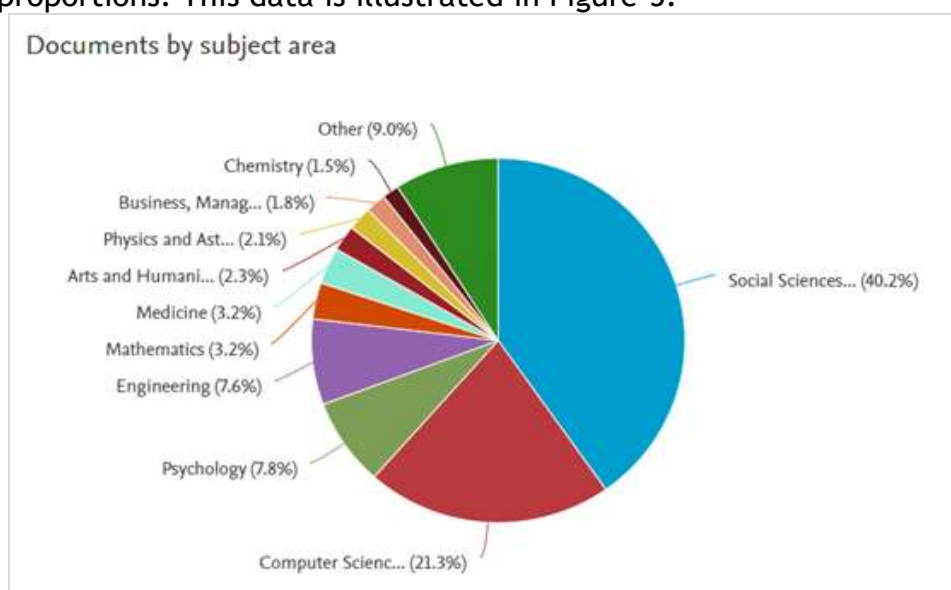


**Figure 4.** Publications by type from 2018-2022

Based on the data above, it is evident that self-regulated learning is predominantly published in the form of articles, encompassing both theoretical and research findings from various disciplines. This suggests that self-regulated learning has permeated different fields because self-regulation seems to be an important skill for anyone to possess, enabling them to manage their time, attitudes, and emotions to lead competent and independent lives in this era (Manso-Vázquez et al., 2016; Ozer & Yukselir, 2021).

### Self-Regulated Learning by Subject Area

The analysis of subject areas in self-regulated learning publications from 2018 to 2022 yielded 23 subject areas. The highest contribution came from social sciences (40.2%), followed by computer science (20.3%), psychology (7.8%), engineering (7.6%), mathematics and arts & humanities (both 3.2%), arts and humanities (2.3%), and physics and astronomy (2.1%). Other fields accounted for smaller proportions. This data is illustrated in Figure 5:



**Figure 5.** Subject areas of publications in the last 5 years

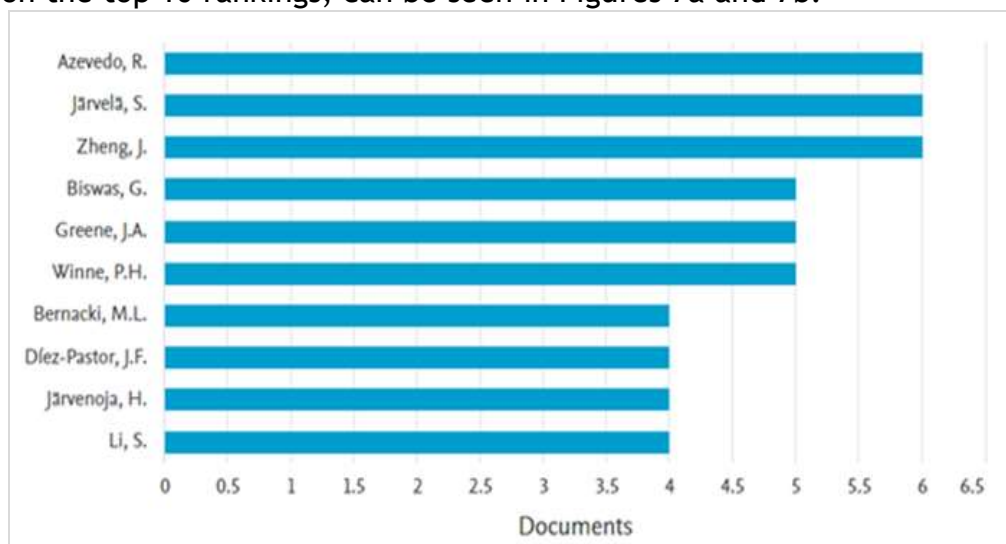


5.	Chen et al, (2020)	Self-regulated mobile game-based English learning in a virtual reality environment.	<i>Computers &amp; Education</i>	73
6.	Moreno-Marcos et al, (2020)	Temporal analysis for dropout prediction using self-regulated learning strategies in self-paced MOOCs.	<i>Computers &amp; Education</i>	72
7.	Winne, (2018)	Theorizing and researching levels of processing in self-regulated learning.	<i>British Journal of Educational Psychology</i>	64
8.	Khan et al, (2018)	Virtual reality simulation training for health professions trainees in gastrointestinal endoscopy.	<i>Cochrane Database of Systematic Reviews</i>	59
9.	Hwang et al, (2021)	Effects of a social regulation-based online learning framework on students' learning achievements and behaviors in mathematics.	<i>Computers &amp; Education</i>	58
10.	Zheng et al, (2020).	Profiling self-regulation behaviors in STEM learning of engineering design.	<i>Computers &amp; Education</i>	55

From the above data, it can be observed that in the past 5 years, many authors have conducted literature reviews and research on self-regulated learning. Among the top 10 authors according to citation rankings, there were 838 instances of self-regulated papers being cited from various countries and different disciplines.

### Self-regulated learning by author, affiliation, and country

The data on the most contributed publications by authors in the past 5 years, based on the top 10 rankings, can be seen in Figures 7a and 7b.

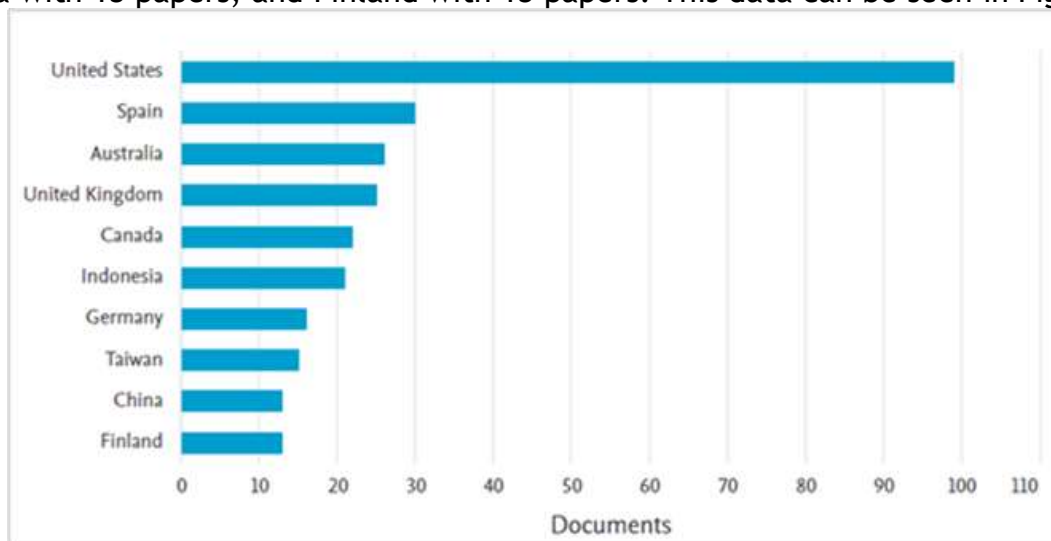


**Figure 7a.** Authors with the most publications in the past 5 years



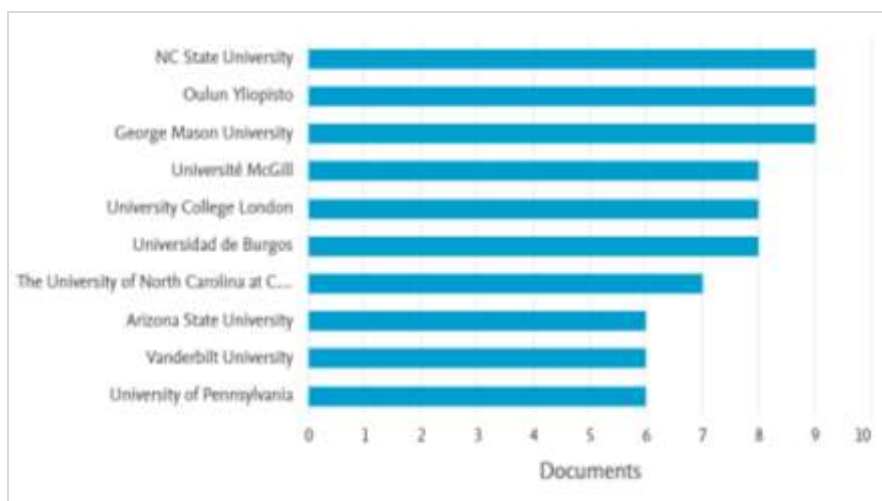
**Figure 7b.** Distribution of authors in the past 5 years

In addition to authors, this data also indicates the countries that have published the most on self-regulated learning in the past 5 years. The top contributing countries are the United States with 99 papers, Spain with 30 papers, Australia with 26 papers, the United Kingdom with 25 papers, Canada with 22 papers, Indonesia with 21 papers, Germany with 16 papers, Taiwan with 14 papers, China with 13 papers, and Finland with 13 papers. This data can be seen in Figure.



**Figure 8a.** Countries with the highest publication contributions

As for the affiliations that have contributed the most publications, they are NC State University with 9 papers, Oulun Yliopisto with 9 papers, Université McGill with 9 papers, George Mason University with 8 papers, University College London with 8 papers, Universidad de Burgos with 8 papers, The University of North Carolina at Chapel Hill with 7 papers, Arizona State University with 6 papers, Vanderbilt University with 6 papers, and the University of Pennsylvania with 6 papers.



**Figure 8b.** Affiliations with the highest publication contributions.

From the data above, there is a correlation between the contributing countries and the campuses where the authors are affiliated. The more campuses that write about self-regulated learning, the more they contribute to the advancement of their respective countries. This is evidenced by the fact that out of 10 affiliations, six of them are campuses in the United States. Looking at the country rankings, Indonesia is ranked 6th out of 10 countries with 21 documents contributed. However, when looking at the affiliations, Indonesia does not make it into the top 10 nominations because publications on self-regulated learning are distributed across several campuses in Indonesia, namely Malan State University with 3 documents, Jakarta State University with 3 documents, UI with 2 documents, Jember University with 2 documents, and Yogyakarta State University with 2 documents, while the rest are evenly divided with 1 document each on several campuses. This means that there are still few researchers in Indonesia who are interested in researching, paying attention to, and developing self-regulated learning, considering it not the concern of educational actors, but rather the domain of psychologists. However, based on the data I have gathered over the past 5 years, the subject area of psychology only contributes 7.8% of the total 352 publications conducted. Therefore, research on self-regulated learning is crucial in education, especially in science education. Self-regulated learning discusses how individuals can engage in self-regulatory mechanisms such as self-observation, self-assessment, and self-response (Kim, 2020). Speaking of science education, it is not only about mastering a set of knowledge consisting of facts, concepts, or principles, but also about an inquiry process (Iswatun et al., 2021). In this inquiry process, self-regulated learning is highly needed because the essence of science education encompasses three elements: scientific processes, scientific products, and scientific attitudes. Moreover, science education also has requirements that must be fulfilled, namely being systematic, objective, and using scientific methods.

## CONCLUSION

Based on the results of the article search using big data from Scopus for the keyword "self-regulated learning," the following conclusions can be drawn: (1) The publication trend on self-regulated learning in education experiences relative fluctuations from year to year; (2) The subject areas with the most publications on self-regulated learning are social sciences, followed by computer science, psychology, and engineering, with the most common types of publications being articles, conferences, book chapters, and reviews; (3) Many authors from various countries and disciplines examine and cite publications on self-regulated learning, including the United States, Spain, Australia, the United Kingdom, Canada, Indonesia, Germany, Taiwan, China, and Finland, divided among several campuses.

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