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## Research on Self-Regulated Learning in Mathematics Learning (1980-2023):

### A Bibliometric Review

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**Abstrak.** *Self-Regulated Learning* (SRL) adalah kemampuan individu untuk secara efektif menggunakan berbagai strategi dalam mencapai tujuan belajarnya. Tujuan dari penelitian ini yaitu untuk menangkap tren penelitian terkait *self-regulated learning* siswa di tingkat sekolah menengah dari tahun 1980 hingga 2023. Metode yang digunakan dalam penelitian ini adalah metode analisis *bibliometric* deskriptif, yaitu untuk menganalisis literatur ilmiah, menitikberatkan pada pengukuran dan deskripsi pola-pola dalam data bibliografis. *Database scopus* digunakan sebagai data penelitian. Hasil penelitian menunjukkan bahwa peningkatan jumlah publikasi yang pesat terjadi pada tahun 2014 ke tahun 2015 serta pada tahun 2017 ke tahun 2018. Publikasi pada tahun 2006 telah dikutip lebih banyak dari tahun lainnya. Negara Amerika Serikat menjadi negara yang paling berpengaruh terhadap bidang ini. Publikasi pada jurnal terkait dengan penelitian *self-regulated learning* paling banyak berada pada peringkat Q1. Fokus penelitian terkait bidang ini dibagi menjadi tiga bagian yaitu, 1) *development, practice, dan task*; 2) *strategy, mathematics achievement, dan reasoning*; 3) *environment dan understanding*. Adapun tema baru dalam penelitian ini yaitu, *self efficacy, attitude, environment, age dan reasoning*.

**Kata kunci:** Bibliometrik, Pembelajaran Matematika, *Self-Regulated Learning*

**Abstract.** *Self-regulated learning* (SRL) is the ability of individuals to use various strategies to achieve their learning goals effectively. The purpose of this study is to capture the research landscape related to Self-Regulation Student learning at the secondary school level from 1980 to 2023. The method used in this study is a descriptive bibliometric analysis method aimed at analyzing scientific literature, focusing on the measurement and description of patterns in bibliographic data. The Scopus database is used as the research data. The results showed that a rapid increase in the number of publications occurred from 2014 to 2015 and from 2017 to 2018. Publications in 2006 were cited more than in any other year. The United States of America is the most influential country in this field. Publications in journals related to self-regulated research The most learning is at the Q1 level. The focus of research related to this field is divided into three parts, namely, 1) *development, practice, and tasks*; 2) *strategy, mathematics achievements, and reasoning*; and 3) *environment and understanding*. The new themes in this research are *self-efficacy, attitude, environment, age, and reasoning*.

**Keywords:** *Bibliometric, Mathematics Learning, Self-Regulated Learning*

## **Introduction**

Self-regulated learning (SRL) is an individual's ability to use various strategies effectively to achieve their learning goals (Cho et al., 2017). Self-regulated learning is a learning process that consists of the growth of behavior that affects student learning. The learning process is planned according to student goals so that the learning situation in the classroom changes (Puteha & Ibrahim, 2010). According to Tee et al. (2021), an integral part of the learning process, which consists of any actions, behaviors, and strategies that learners choose to facilitate their learning, is called self-regulation. So, self-regulated learning is a person's ability to plan the learning process in accordance with the learning objectives.

Self-regulated learning will occur when students actively control themselves from everything they do and are able to plan something, evaluate, and reflect on what they have experienced (Ciptaningtyas et al., 2018). So that students do not feel inferior in dealing with math problems and can trust themselves, self-regulation is needed (Zetriuslita et al., 2020). Self-regulated learning (SRL) is an effective form of learning for students to set learning goals and make plans before the start of learning (Adam et al., 2017). SRL plays an important role in academic achievement (Xiao et al., 2019). Self-learning is a cyclical process that includes three phases. 1) The thinking phase includes task analysis (goal setting, strategic planning) and self-motivated beliefs (self-efficacy, goal orientation). 2) performance/volition control, which includes self-control (self-instruction, concentration, task strategy). 3) self-reflection which includes self-reflection (self-judgment, self-evaluation) and self-satisfaction (Fauzi & Widjajanti, 2018)

The self-regulation capacity of students is very important in learning mathematics, especially in secondary schools; the lack of self-regulation can limit the performance and abilities of students to participate fully in class (Semana & Santos, 2018). SRL serves as a comprehensive framework for understanding how active students are in the learning process in class; SRL involves a number of cognitive, motivational, and behavioral aspects (Fadlelmula et al., 2015). Students with a high level of self-regulation, including emotional regulation, attention, and behavior, positively influence the teacher's expectations of them (İvrendi, 2016).

According to Kalenda & Vávrová (2016), students must make SRL one of the important factors so that the success of their studies can be achieved. Therefore, SRL can also be said as the ability to control the student both physically and psychologically to be able to achieve learning goals (Angraini et al., 2022, 2023; Muhammad & Yolanda, 2022; Siahaan et al., 2023; Triansyah et al., 2023). These statements further emphasize that SRL is needed by students so that their learning achievement can be further increased. Research related to self-regulated in learning mathematics, where Self Regulated This learning can produce better achievement and desired affective results (Gafoor & Kurukkan, 2016), have high motivation and achievement (Fauzi & Widjajanti, 2018), improve students' critical thinking skills (Muhammad et al., 2023).

Research related to self-regulated learning has continued to increase in recent years. For this reason, it is necessary to carry out a literature study related to this field. The method that can be used to analyze research results in certain fields is the bibliometric analysis method (Phoong et al., 2022). Many studies have conducted literature studies using analytical methods such as those carried out by (Muhammad, Himmawan, et al. 2023; Muhammad, Marchy et al., 2022, 2023; Muhammad, Mukhibin et al., 2022; Muhammad, Samosir, et al., 2023). As for research using a literature study review related to self-regulated learning in mathematics learning, it is like research conducted by Adam et al. (2017) about "self-regulated learning and online learning: a systematic review." The study only looked at self-regulated learning in general and associated with online learning; for that, researchers want to see self-regulated learning in mathematics learning in general, which is not only online learning, namely at the high school level.

This research is urgent because of the pressing pressure of self-regulated learning in mathematics learning at the secondary school level. SRL not only influences academic achievement but also contributes to students' active participation in the classroom. The focus on SRL includes cognitive, motivational, and behavioral aspects, providing a positive impact on teacher expectations. This research is important because it illustrates the integral role of SRL in achieving

learning goals and increasing student achievement while exploring its link to improving critical thinking skills in the context of mathematics learning.

### **Research purposes**

This research aims to capture the research landscape related to self-regulation Student learning at the secondary school level from 1980 to 2023. The research questions are as follows.

- 1) How do publication trends relate to self-regulated learning in mathematics learning?
- 2) How do quote trends relate to self-regulated learning in mathematics learning?
- 3) How is the geographical distribution of publications and patterns of cooperation between countries in research related to self-regulation learning in mathematics learning?
- 4) How is the distribution of journal rankings related to self-regulated learning in mathematics learning?
- 5) What is the focus of research related to self-regulated learning in mathematics learning?

### **Method**

The bibliometric analysis method was used in this study, while the data source obtained came from the database Scopus, which has been refined in several stages. According to Moher et al. (2009), there are four main stages in the data collection process, namely identification, eligibility screening, and inclusion. These stages can be seen in Figure 1.

In the first stage, the researcher carried out the identification process by entering keywords in the database search Scopus. Search The strings used can be seen in Figure 1. The data obtained from this first stage are 460 publications. Then, the second stage is carried out; in this second stage, the researcher conducts screening. In conducting the screening, researchers set criteria, namely that articles must be published in English in journals or conference papers. The article is in mathematics and contains self-regulated learning in middle school. After the screening process was carried out, the 460 publications changed to only 67

publications. The feasibility process is carried out after screening. In this stage, the researcher manually checks the 67 publications. The researcher checks and ensures that the article discusses self-regulation learning in mathematics learning at the high school level; articles that were inappropriate or did not contain these were not included in the next process. After feasibility, 56 publications that met the requirements were obtained and could be continued at the inclusion stage.

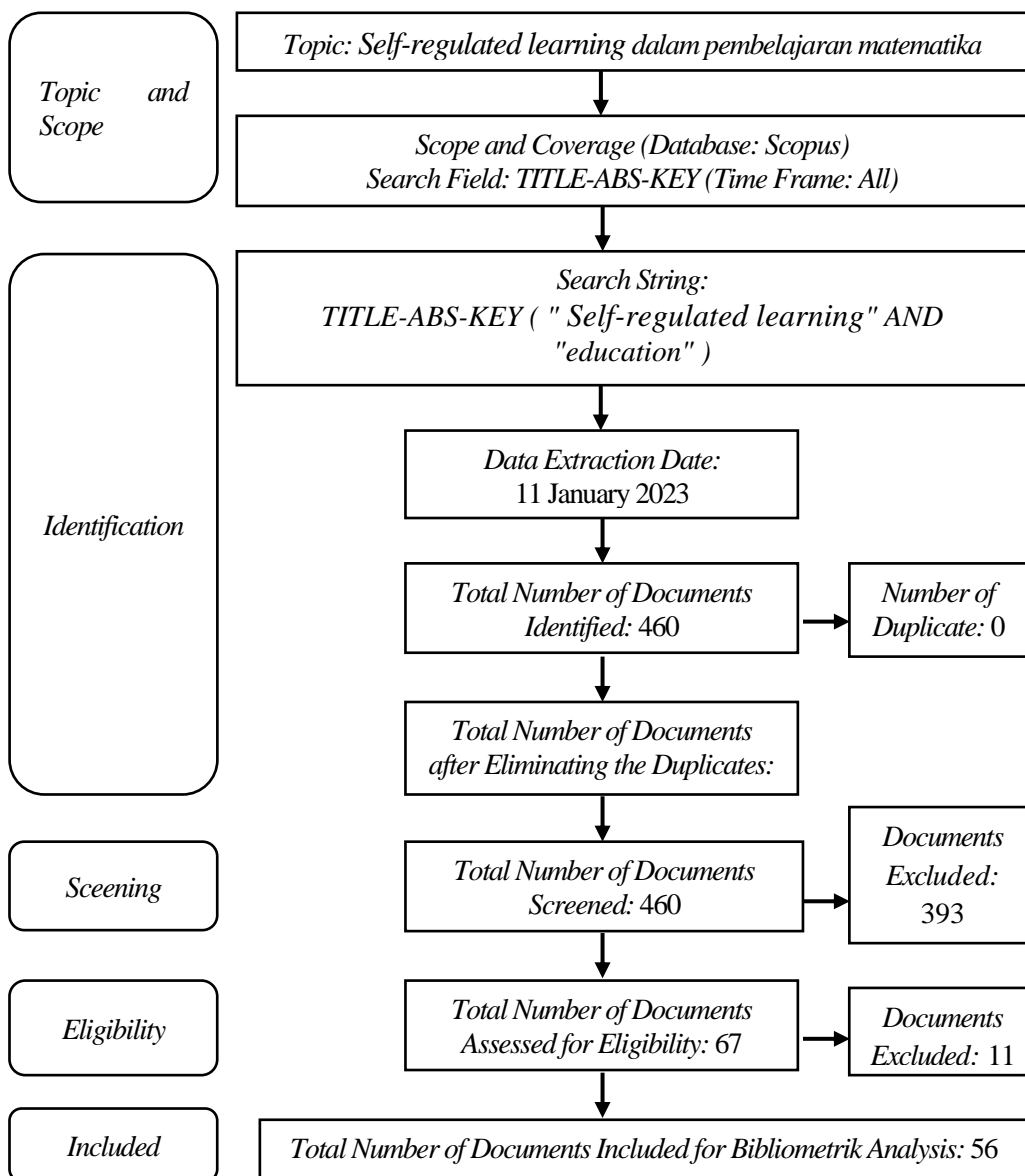


Figure 1. Data Collection Process

### **Data analysis method**

Publication and citation trends related to self-regulated mathematics learning in secondary schools are separated by year from 1980 to 2023. The number of publications each year is displayed via a bar chart with the help of Microsoft Excel software. Then, the average publication citations are calculated using Microsoft Excel software. Software PoP is used to make it easier to calculate the h-index and g-index of publications.

The geographical distribution of countries is displayed with the help of Microsoft Excel software, but to see cooperation between countries, researchers use the VOSviewer application. In displaying journal rankings based on quartile values, researchers use Microsoft Excel software to display the journal ranking diagram. Data that has been obtained from the database Scopus, as many as 56 publications will be grouped based on (Q1), (Q2), (Q3), and (Q4). The publications related to self-regulated learning have been published in the abovementioned journal.

The research focuses on self-regulation learning in mathematics learning in secondary schools. It is carried out with the help of the VOSviewer application by analyzing events with keywords. The researcher sets a threshold for displaying the research focus; namely, the researcher sets a minimum of 3 publications that use the keywords together.

### **Results and Discussion**

Publications related to self-regulated learning have gone through the data collection process so that 56 publications from 1980 to 2023 follow the criteria, then a descriptive bibliometric analysis was carried out. Publication trends, citation trends, country and journal distribution, and research focus will be discussed further.

#### **How do publication trends relate to self-regulated learning in mathematics learning?**

Publication trends related to self-regulated learning from 1980 to 2023 are shown in Figure 2. 56 publications are grouped by publication year, as shown in Figure 2 below.

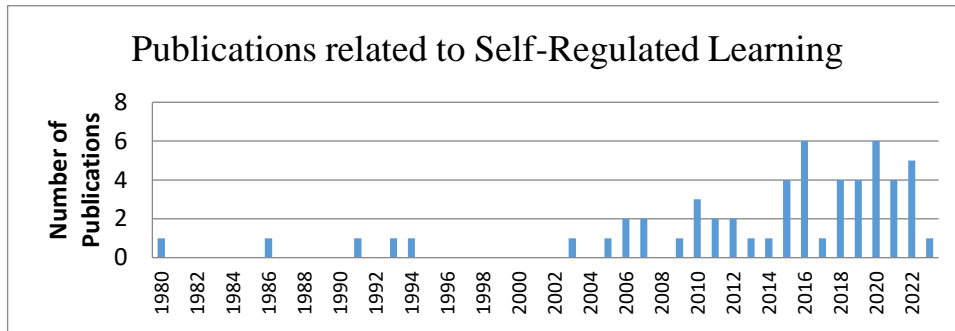


Figure 2. Number of Publications from 1980 to 2023

Figure 2 shows that 2016 and 2020 have published six articles, the highest number of publications compared to other years. It can be seen that publications do not always increase yearly, even though the number of publications from 1980 to 2014 has not changed much. A rapid increase in the number of publications occurred from 2014 to 2015 and from 2017 to 2018, which experienced an increase of 300 percent. Following what was conveyed by Adam et al. (2017), around 2017, articles related to self-regulated learning have been widely published.

**How do quote trends relate to self-regulated learning in mathematics learning?**

Trending quotes related to self-regulated learning from 1980 to 2023 can be seen in Table 1. As with publication trends, as many as 56 publications are grouped by year of publication, which will be seen based on total publications per year, NCP, TC, C/P values, and others, which can be seen in Table 1.

YEAR	TP	NCP	TC	C/P	C/CP	H	G
2023	1	-	-	-	-	-	-
2022	5	2	3	0.60	1.50	1	1
2021	4	3	7	1.75	2,33	2	2
2020	6	5	29	4.83	5.80	3	5
2019	4	4	39	9.75	9.75	4	4
2018	4	4	19	4.75	4.75	2	4
2017	1	1	11	11.00	11.00	1	1
2016	6	6	101	16.83	16.83	6	6
2015	4	4	82	20.50	20.50	4	4
2014	1	1	4	4.00	4.00	1	1
2013	1	1	21	21.00	21.00	1	1
2012	2	2	15	7.50	7.50	2	2
2011	2	2	52	26.00	26.00	2	2
2010	3	3	75	25.00	25.00	3	3
2009	1	1	4	4.00	4.00	1	1
2008	-	-	-	-	-	-	-
2007	2	2	50	25.00	25.00	2	2

YEAR	TP	NCP	TC	C/P	C/CP	H	G
2006	2	2	148	74.00	74.00	2	2
2005	1	1	22	22.00	22.00	1	1
2004	-	-	-	-	-	-	-
2003	1	1	54	54.00	54.00	1	1
2002	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-
1999	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-
1994	1	1	15	15.00	15.00	1	1
1993	1	1	6	6.00	6.00	1	1
1992	-	-	-	-	-	-	-
1991	1	1	77	77.00	77.00	1	1
1990	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-
1986	1	1	28	28.00	28.00	1	1
1985	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-
1980	1	1	17	17.00	17.00	1	1

Notes. TP=total of publication , NCP= number of cited publication , TC=total citations , C/P= average citations per publication , C/CP= average citations per cited publication , h=h- index , g=g- index

**Table 1. Citation Analysis of Publications**

Table 1 above shows that the value (NCP) in 2016, which was 6, was the year with the highest NCP compared to other years. Then, judging from the number of citations, publications in 2006 have been cited more than any other year, with 148 citations. The number of publications in 2020 and 2016 was the same, namely six publications each, and was the most significant compared to the previous year. However, the previous year, especially 2006, had a large research impact. However, many years did not have a number of citations, namely from 1995 to 2002 and from 1981 to 1985.

H-index and g-index values were published in 2016 with h-index = 6 and g-index = 6. So, it can be said that 2016 also had a big impact on this research. A total of 6 publications that have been cited in 2016 have a total of 101 citations, meaning that at least 6 of these publications have been cited 16 times each. The publications



in 2016 had a major impact on this field. The publications in 2016 can be seen in Table 2.

No	Author ( Year )	Title	Sources	Citation
1	(Chen & Chiu, 2016)	Collaboration Scripts for Enhancing Metacognitive Self-regulation and Mathematics Literacy	International Journal _ of Science and Mathematics Education	33
2	(İvrendi, 2016)	Investigating kindergarteners' number sense and self-regulation scores concerning their mathematics and Turkish scores in the middle school	Mathematics Education Research Journals	27
3	(Reinholz, 2016)	developing mathematical practices through reflection cycles	Mathematics Education Research Journals	21
4	(Nor et al., 2016)	The relationship between emotional intelligence and mathematical competencies among Secondary school students	Journals on Mathematics Education	8
5	(Bruckmaier et al., 2016)	Measuring mathematics teachers' professional competence by using video clips (COACTIV video)	ZDM - Mathematics Education	7

**Table 2. Articles published in 2016 ( citation >6)**

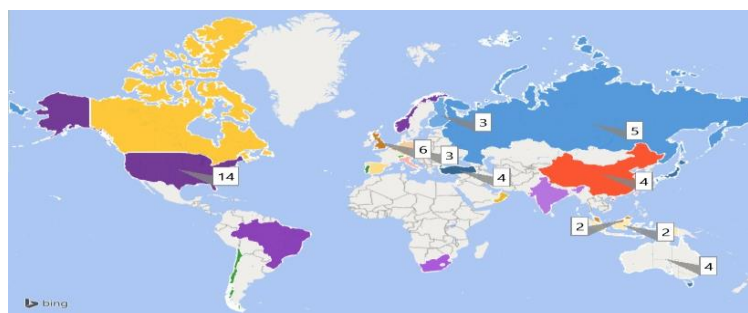
Table 2 above shows that Chen & Chiu's (2016) research has the most citations, with 33 total citations. The article is widely cited for designing a set of computerized collaboration scripts for multitouch that support collaborative design-based learning and evaluating their effects on various aspects of metacognitive self-regulation in terms of planning and control and achievement of mathematical literacy at higher and lower levels. In addition, the study suggests that future research can track medium- or long-term developments in metacognitive self-regulation. Another avenue of further investigation is to compare what students express on the metacognition scale and how much their learning behavior has changed in reality. However, this requires a qualitative or mixed methods approach.

Research conducted by İvrendi (2016) has the second-highest number of citations, with 27 citations. This study aims to determine the predictive power of the number value sense and self-regulation of kindergarten children on their math

and Turkish test scores in grades 5 and 6. The findings from this study provide further evidence of the important role of children's early skills in secondary school mathematics and language achievement. The journals in Table 2 can also be used as a reference for researchers related to this field who wish to publish their articles, such as the International Journal of Science and Mathematics Education and Mathematics Education Research Journals."

### **How is the geographical distribution of publications and patterns of cooperation between countries in research related to self-regulation learning in mathematics learning?**

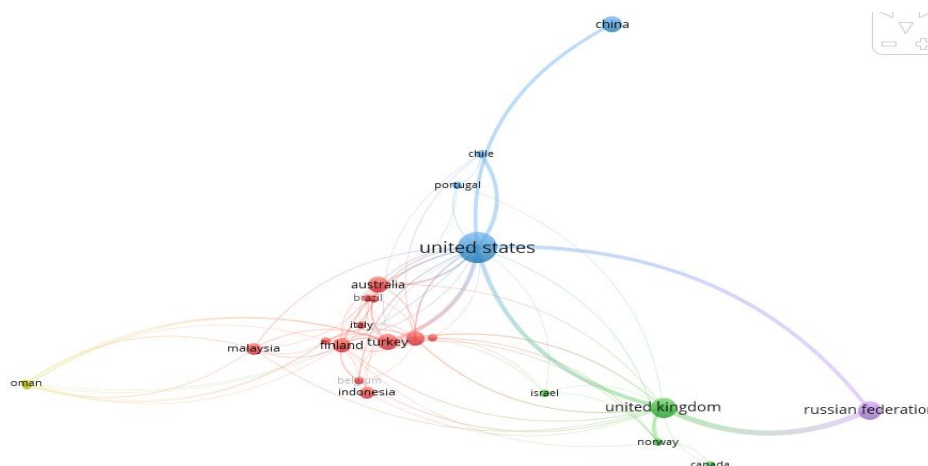
The countries shown in Figure 3 below are the country of origin of the publication author. Geographically, the distribution from the author's country of origin can be seen in the picture below.



**Figure 3. Geographic Distribution of Publications**

From Figure 3 above, it can be seen that the United States is the most influential country in self-regulated research Learning. It can be seen by the many United States publications, which have published 14 documents related to this field. The second place is the United Kingdom, which is the second most influential country in self-regulated research Learning, namely with six documents that have been published. The distribution of data shows that almost all continents have published documents related to this field. The European continent is the most influential in this field because it has published over 20 documents, or more than 35% of the total publications. This number is very high when compared to publications from other continents. It is in accordance with what was suggested by Carneiro et al. (2011) that articles on self-regulation began to be published in the United States in social psychology and personality journals in the 1980s.

The pattern of collaboration between countries can be seen in Figure 4 on lower. Researchers do not set a threshold at this stage. It means that countries that only have 1 document related to this field will be displayed even if the country does not have an employment relationship the same as other countries. The number of countries displayed is 23, as shown in Figure 4 below.



**Figure 4. Cooperation Between Countries**

From Figure 4 above, it can be seen that the United States circle has the largest circle diameter when compared to other countries. It shows that the country has the same employment relations as other countries. From the VOSviewer display, it can be seen that the United States has worked the same as 21 other countries, meaning that the country has worked almost the same as all countries displayed, with only one country that does not have a working relationship with the same as the United States of America, namely the country of Canada.

#### **How is the distribution of journal rankings related to self-regulated learning in mathematics learning?**

The distribution of journal rankings can be seen from the quartile (Q) value of journals related to self-regulated publications Learning. Journal ranking seen on the website Scimagojr. The distribution of journal ratings can be seen in Figure 5 below.

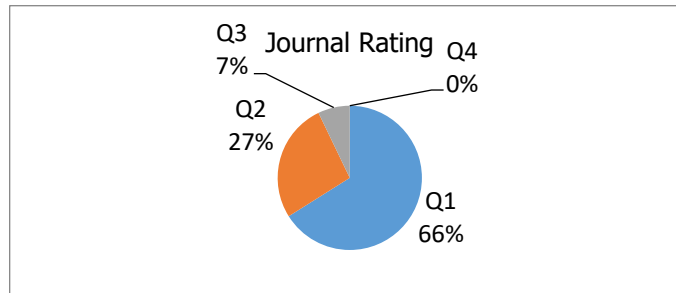


Figure 5. Ranking based on Journal Quartile values

In Figure 5 above, it can be seen that journal publications are related to self-regulated research. The most learning is in the Q1 ranking, namely 66%, with 37 journals. It means that the number of articles published in Q1-ranked journals is more than half the total. In second place are journals with a Q2 rating of 27%, totaling 15. The journals that published several articles can be seen in Table 3 below

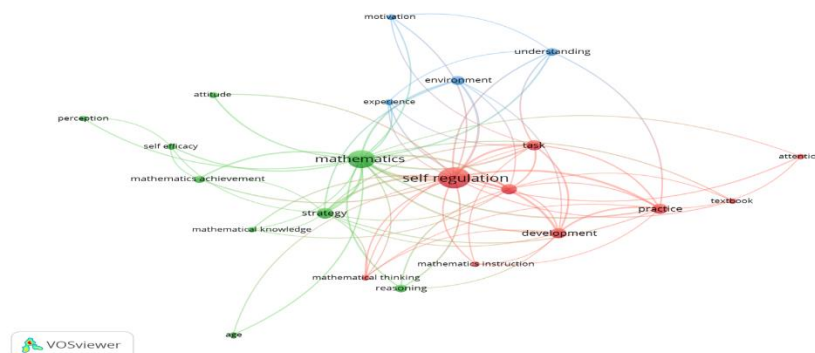
Journal name	Number of articles
ZDM - Mathematics Education	7
InternationalJournal of Science and Mathematics Education	6
Educational Studies in Mathematics	5
Mathematics Education Research Journals	5
Eurasian Journal of Mathematics, Science and Technology Education	3
Journals on Mathematics Education	3

Table 3. List of journals related to self-regulated learning (articles > 2)

The journal "ZDM-Mathematics Education" has the most number of articles compared to other journals, with seven articles. Furthermore, the journal with the second highest number of articles is the journal "International Journal of Science and Mathematics Education," which has six articles. It means that these journals can be used as a reference for further research to publish articles related to self-regulation learning.

**What is the focus of research related to self-regulated learning in mathematics learning?**

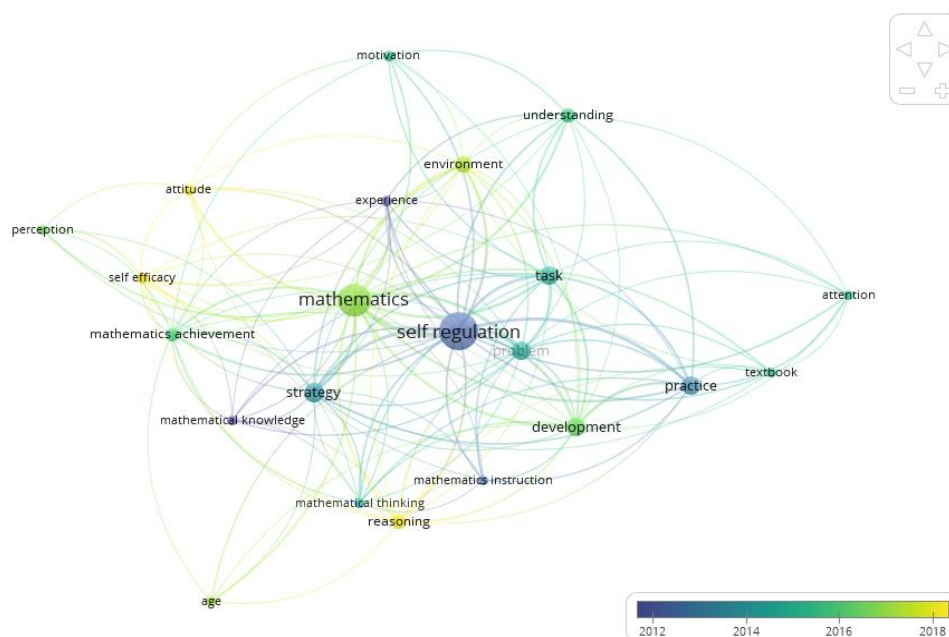
The researcher sets the threshold at this stage, namely shared keywords that are displayed with a minimum of 3 publications, meaning that keywords that have been used together in 3 or more publications will be displayed on the shared keyword appearance with the help of VOSviewer. From 389 keywords after the threshold was set, there were only 20, as shown in Figure 6.



**Figure 6. Keyword Co-occurrence (occurrence Threshold  $\geq 3$ )**

The focus of the research can be seen from the clusters shown in Figure 6 above, where several colors exist. This color indicates a research cluster related to self-regulated learning. There are three clusters; red is the largest cluster, followed by green and blue. It means that the research focus is divided into three parts, namely 1) The first cluster (in red) consists of 9 items when viewed from the size of the circle in this first cluster, the keywords that have the largest diameter are the keywords development, practice, and task, meaning these keywords became the focus of the first research together with self-regulation; 2) The second cluster (in green) consists of 9 items, strategy keywords, mathematics achievement, and reasoning are the largest circles in the cluster, meaning that these keywords are the first focus of research together with mathematics; 3) The third cluster (in blue) consists of 4 items, the keyword that is the focus of the last research is environment and understanding.

The first research focus is development, practice, and task. Research conducted by Paris & Newman (1990) on "Development Aspects of Self-Regulated Learning" the article focuses on developmental changes in students' theories about learning and how they are affected by variables at school such as task difficulty, helping behavior, and standards of success. We will then look at new themes in this field, as shown in Figure 7.



**Figure 7. Overlays Network**

In Figure 7 above, it can be seen that there are circles with three different colors. The yellow color indicates a new theme in this field. On the other hand, the blue color indicates the old theme in this field. The new themes in this research are self-efficacy, attitude, environment, age, and reasoning. Novelty in this field can be seen from the linkages between keywords. To determine the recency of researchers focusing on keywords that become new themes with a research focus of one to three. The reasoning keyword is the new theme, and together with self-regulation, it is not directly connected with other new theme keywords, such as attitude. The environment keyword, which becomes the new theme together with self-regulation, has not been directly linked to other new theme keywords, such as self-efficacy and age. It means a new theme and update or novelty. It can be used as a reference for further research related to this field to determine the theme and focus of the research.

## Conclusion

Based on the results and discussion, it can be concluded that a rapid increase in publications occurred from 2014 to 2015 and from 2017 to 2018. Publications in 2006 have been cited more than any other year, with 148 citations. The United States of America is the most influential country in this field. Publications in

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journals related to self-regulated research The most learning is in the Q1 ranking, namely 66% with a total of 37 journals. The journal "ZDM-Mathematics Education" has the most number of articles compared to other journals, with seven articles. The focus of research related to this field is divided into three parts, namely, 1) development, practice, and task; 2) strategy, mathematics achievement, and reasoning; and 3) environment and understanding. The new themes in this research are self-efficacy, attitude, environment, age, and reasoning. The reasoning keyword is the new theme, and together with self-regulation, it is not directly connected with other new theme keywords, such as attitude. The environment keyword, which becomes the new theme together with self-regulation, has not been directly linked to other new theme keywords, such as self-efficacy and age. It means that the new and novelty theme can be used as a reference for further research related to this field to determine the theme and research focus.

## Reference

- Adam, N. L., Alzahri, F. B., Cik Soh, S., Abu Bakar, N., & Mohamad Kamal, N. A. (2017). Self-Regulated learning and online learning: A systematic review. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 10645 LNCS, 143–154. [https://doi.org/10.1007/978-3-319-70010-6\\_14](https://doi.org/10.1007/978-3-319-70010-6_14)
- Angraini, L. M., Alzaber, A., Sari, D. P., Yolanda, F., & Muhammad, I. (2022). Improving mathematical critical thinking ability through augmented reality-based learning. *Aksioma: Jurnal Program Studi Pendidikan Matematika*, 11(4), 3533. <https://doi.org/10.24127/ajpm.v11i4.5968>
- Angraini, L. M., Yolanda, F., & Muhammad, I. (2023). Augmented Reality : The Improvement of Computational Thinking Based on Students' Initial Mathematical Ability. *International Journal of Instruction*, 16(3), 1033–1054.
- Bruckmaier, G., Krauss, S., Blum, W., & Leiss, D. (2016). Measuring mathematics teachers' professional competence by using video clips (COACTIV video). *ZDM - Mathematics Education*, 48(1–2), 111–124. <https://doi.org/10.1007/s11858-016-0772-1>
- Carneiro, R., Lefrere, P., Steffens, K., & Eds, J. U. (2011). *Self-Regulated Learning in Technology Enhanced Learning Environments A European Perspective* (Issue January).
- Chen, C.-H., & Chiu, C.-H. (2016). Collaboration Scripts for Enhancing Metacognitive Self-regulation and Mathematics Literacy. *International Journal of Science and Mathematics Education*, 14(2), 263–280.



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<https://doi.org/10.1007/s10763-015-9681-y>

- Cho, K. K., Marjadi, B., Langendyk, V., & Hu, W. (2017). The self-regulated learning of medical students in the clinical environment - A scoping review. *BMC Medical Education*, *17*(1), 1–13. <https://doi.org/10.1186/s12909-017-0956-6>
- Ciptaningtyas, A., Pratiwi, H., & Mardiyana. (2018). The profile of students' self-regulated learning at vocational high school. *Journal of Physics: Conference Series*, *1022*(1). <https://doi.org/10.1088/1742-6596/1022/1/012009>
- Dettori, G., & Persico, D. (2010). *Fostering self-regulated learning through ICT*. IGI Global.
- Fadlelmula, F. K., Cakiroglu, E., & Sungur, S. (2015). Developing a Structural Model on the Relationship among Motivational Beliefs, Self-Regulated Learning Strategies, and Achievement in Mathematics. *International Journal of Science and Mathematics Education*, *13*(6), 1355–1375. <https://doi.org/10.1007/s10763-013-9499-4>
- Fauzi, A., & Widjajanti, D. B. (2018). Self-regulated learning: The effect on student's mathematics achievement. *Journal of Physics: Conference Series*, *1097*(1). <https://doi.org/10.1088/1742-6596/1097/1/012139>
- Gafoor, A., & Kurukkan, A. (2016). Self-Regulated Learning\_A Motivational\_A. *International Journal of Education and Psychological Research*, *5*(3), 60–65.
- İvrendi, A. (2016). Investigating kindergarteners' number sense and self-regulation scores in relation to their mathematics and Turkish scores in middle school. *Mathematics Education Research Journal*, *28*(3), 405–420. <https://doi.org/10.1007/s13394-016-0172-4>
- Kalenda, J., & Vávrová, S. (2016). Self-regulated Learning in Students of Helping Professions. *Procedia - Social and Behavioral Sciences*, *217*, 282–292. <https://doi.org/10.1016/j.sbspro.2016.02.086>
- Moher, D., Liberati, A., Tetzlaff, J., & Douglas. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *Journal of Chinese Integrative Medicine*, *7*(9), 889–896. <https://doi.org/https://doi.org/10.1136/bmj.b2535>
- Muhammad, I., Elmawati, Samosir, C. M., & Marchy, F. (2023). Bibliometric Analysis: Research on Articulate Storylines in Mathematics Learning. *EduMa: Mathematics Education Learning And Teaching*, *12*(1), 77–87.
- Muhammad, I., Himmawan, D. F., Mardliyah, S., & Dasari, D. (2023). Analisis Bibliometrik: Fokus Penelitian Critical Thinking dalam Pembelajaran Matematika (2017–2022). *JPMI (Jurnal Pembelajaran Matematika Inovatif)*, *6*(1), 78–84. <https://doi.org/10.22460/jpmi.v6i1.14759>
- Muhammad, I., Marchy, F., Do, A., & Naser, M. (2023). Analisis Bibliometrik : Tren Penelitian Etnomatematika dalam Pembelajaran Matematika Di Indonesia ( 2017 – 2022 ). *JIPM (Jurnal Ilmiah Pendidikan Matematika)*, *11*(2), 267–279. <https://doi.org/10.25273/jipm.v11i2.14085>



- 
- Muhammad, I., Marchy, F., Rusyid, H. K., & Dasari, D. (2022). Analisis Bibliometrik: Penelitian Augmented Reality Dalam Pendidikan Matematika. *JIPM (Jurnal Ilmiah Pendidikan Matematika)*, 11(1), 141. <https://doi.org/10.25273/jipm.v11i1.13818>
- Muhammad, I., Mukhibin, A., Naser, A. do muhammad, & Dasari, D. (2022). Bibliometric Analysis: Research Trend of Interactive Learning Media in Mathematics Learning in Indonesia. *Prisma Sains: Jurnal Pengkajian Ilmu Dan Pembelajaran Matematika Dan IPA IKIP Mataram*, 11(1), 10–22. <https://doi.org/10.26737/jpmi.v8i1.4005>
- Muhammad, I., Samosir, C. M., & Marchy, F. (2023). Bibliometric Analysis : Adobe Flash Cs6 Research in Mathematics Learning. *Jurnal Pendidikan Matematika Indonesia*, 8(1), 25–34.
- Muhammad, I., & Yolanda, F. (2022). Minat Belajar Siswa Terhadap Penggunaan Software Adobe Flash Cs6 Profesional Sebagai Media Pembelajaran. *JIPM (Jurnal Ilmiah Pendidikan Matematika)*, 11(1), 1–12. <https://doi.org/10.25273/jipm.v11i1.11083>
- Nor, N. A. K. M., Ismail, Z., & Yusof, Y. M. (2016). The relationship between emotional intelligence and mathematical competency among secondary school students. *Journal on Mathematics Education*, 7(2), 91–100. <https://doi.org/10.22342/jme.7.2.3534.91-100>
- Paris, S. G., & Newman, R. S. (1990). Development Aspects of Self-Regulated Learning. *Educational Psychologist*, 25(1), 87–102. [https://doi.org/10.1207/s15326985ep2501\\_7](https://doi.org/10.1207/s15326985ep2501_7)
- Phoong, S. Y., Khok, S. L., & Phoong, S. W. (2022). The Bibliometric Analysis on Finite Mixture Model. *SAGE Open*, 12(2), 1–13. <https://doi.org/doi.org/10.1177/215824402211010>
- Puteha, M., & Ibrahim, M. (2010). The usage of self-regulated learning strategies among form four students in the mathematical problem-solving context: A case study. *Procedia - Social and Behavioral Sciences*, 8, 446–452. <https://doi.org/10.1016/j.sbspro.2010.12.061>
- Reinholz, D. L. (2016). Developing mathematical practices through reflection cycles. *Mathematics Education Research Journal*, 28(3), 441–455. <https://doi.org/10.1007/s13394-016-0175-1>
- Semana, S., & Santos, L. (2018). Self-regulation capacity of middle school students in mathematics. *ZDM - Mathematics Education*, 50(4), 743–755. <https://doi.org/10.1007/s11858-018-0954-0>
- Siahaan, E. Y. S., Muhammad, I., Dasari, D., & Maharani, S. (2023). Research on critical thinking of pre-service mathematics education teachers in Indonesia (2015-2023): A bibliometric review. *Jurnal Math Educator Nusantara: Wahana Publikasi Karya Tulis Ilmiah Di Bidang Pendidikan Matematika*, 9(1).
- Tee, K. N., Leong, K. E., & Abdul Rahim, S. S. (2021). A Self-Regulation Model

of Mathematics Achievement for Eleventh-Grade Students. *International Journal of Science and Mathematics Education*, 19(3), 619–637. <https://doi.org/10.1007/s10763-020-10076-8>

Triansyah, F. A., Yanti, F., Rabuandika, A., & Muhammad, I. (2023). Augmented Reality Research in Middle Schools: Bibliometric Review. *EDUKASIA: Jurnal Pendidikan Dan Pembelajaran*, 4(1), 369–378.

Xiao, S., Yao, K., & Wang, T. (2019). The Relationships of Self-regulated Learning and Academic Achievement in University Students. *SHS Web of Conferences*, 60, 01003. <https://doi.org/10.1051/shsconf/20196001003>

Zetriuslita, Nofriyandi, & Istikomah, E. (2020). The Increasing Self-Efficacy and Self-Regulation through GeoGebra Based Teaching reviewed from Initial Mathematical Ability (IMA) Level. *International Journal of Instruction*, 14(1), 587–598. <https://doi.org/10.29333/IJI.2021.14135A>