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Literature Study on Self-Regulated Learning in Science Learning of Elementary School Students

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ABSTRACT

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The study was conducted to determine the trend of research topics for self-regulated learning science for elementary school students in 2017-2021. This type of research is a descriptive quantitative research using literature study analysis and bibliometric methods. The data collection process is carried out by conducting observations and documentation on the Google Scholar online database. The data analysis phase was applied Mendeley, Publish or Perish, and VOSViewer. Based on the analysis of 102 research publications, 46 topics emerged. Relevant topics that arise relating to self-regulated learning do not all have a high occurrence rate. Topics with high emergence include Self-regulated learning, Learning Outcomes, Critical Thinking, Scientific Literacy, Motivation, Problem Based Learning, Inquiry, and Discovery Learning. Topics with low emergence and opportunities for further research are Strategy, Learning Media, Science Process Skills, Self-Efficacy, Emotional Intelligence, Metacognitive Skills, and Peer Learning.

Keywords

Literature Studies
Self-regulated learning
Science Learning
Elementary School

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Introduction

⁶² Indonesia as a developing country has never escaped various problems. One of the problems that becomes PR and never ends is the problem in the field of Education. ¹⁷ Based on

the results of a survey in 2019 published by the Organization for Economic Cooperation and Development, Indonesia occupies the bottom 10 positions on the PISA (Programme for International Student Assessment) score. PISA is an international student assessment program that aims to determine the average academic quality of students in each country. This indicates that Indonesia's education output is still very low and lagging behind. PISA scores are taken by measuring the quality of students in three areas, namely, mathematics, Science and Literacy.

Science is divided into Natural Sciences and Social Sciences. Science is a process of activities carried out in order to gain knowledge and action for these activities [1]. Science is a human effort in understanding the universe through observation on an object and using procedures that are then explained by reasoning so as to get a conclusion

Based on this understanding, Natural science can be defined as a fun subject and do a lot of practice and experimentation that should still be able to be done at home. Science as learning is a subject that is easy to understand because basically students encounter concrete examples in the surrounding environment. Through analytical and understanding skills, students should be able to process what they learn independently. This ability to learn independently is called self-regulated learning [2]. A skill that is needed and must be possessed by students, especially during a pandemic where students are required to study independently at home

Self-regulated learning is a situation where individuals control their own learning activities, monitor motivation, and academic goals, manage resources, and become behaviors in the decision-making process and implement the learning process [3]–[5]. Through some expert opinions above, it can be concluded that self-regulated learning is an activity of individuals learning actively as managers of their learning process which includes planning, monitoring, controlling, and evaluating. The series is arranged in such a way as to achieve the learning goals that have been set by the individual himself in the learning process.

Research on the implementation of self-regulated learning in science subjects in elementary schools has been carried out a lot. However, there has been no bibliometric literature review that further reviews these studies. The study of research on the implementation of Self-Regulated Learning science in elementary schools is important to determine the extent of the results of research on self-regulated learning science in elementary schools. In addition, this bibliometric literature study also aims to examine the development of research on self-regulated science learning in elementary schools. Through this research, it is hoped that it can be a reference material for the implementation of self-regulated learning and research that will be carried out in the future.

Based on various problem studies carried out, the formulation of the problem in this research is how the trend of educational research on self-regulated learning of science for elementary school students. The purpose of this study is to determine the trend of educational research on self-regulated learning of elementary school students in the hope that it can be useful for future research reference materials and become a source of information about self-regulated learning science for elementary school students.

Method

A. Types of research

This type of research is descriptive quantitative using literature and bibliometric study analysis methods. Descriptive quantitative research is research that describes the results of research analysis in the form of descriptive paragraphs. Descriptive research is a form of research aimed at describing existing situations, either natural, or related to human habits which include activities, characteristics, changes, relationships, similarities, and differences between one situation and another. Descriptive type research is research by investigating situations, conditions, or other things that have been determined and then the results are presented in the form of a research report.

While quantitative research is a research method carried out by testing research variables using statistical methods. Quantitative research is research carried out by testing the theory by examining the relationship between variables so that the data used consists of numbers that can be analyzed by statistical procedures. Quantitative research is a research with an approach in the form of numbers where this research begins by collecting the data used and then analyzed and concluded [6], [7]. Based on this understanding, it can be concluded that quantitative research is research carried out by statistical methods but interpreted or concluded in descriptive or paragraph form.

B. Location and time period

This research was conducted by collecting data in the online databases Google Scholar and Scopus which can be accessed in Yogyakarta City by researchers. This research was conducted in stages from February 2022.

C. Population and samples

Population is the total number of subjects used in the study. So the population of this study is the entirety of the 2017-2021 research publications on the online databases Google Scholar and Scopus. The sample of this study was taken based on using the purposive sampling technique, namely taking samples based on certain criteria. Based on this, this research sample was taken based on publication criteria that contain self-regulated science learning values for elementary school students with a number based on data found in 2017-2021. The variable of

this study is a study with the title of self-regulated learning science for elementary school students in the 2017-2021 period.

D. Data collection and analysis techniques

The research data collection techniques uses two techniques, namely: Observations (observations) made on the google scholar online database and on databases assisted by publish and perish software and VOSviewer data visualization. Another technique used is documentation by recording and recapturing information related to literature and publishing research on self-regulated science learning for elementary school students for the 2017-2021 period.

Data analysis techniques are a method used to determine the outcome or results of the research carried out. Data analysis techniques are activities carried out after collecting research data [8], [9]. Based on this understanding, the data analysis technique in this study is descriptive statistics with bibliometric methods. Bibliometric method is a method of literature analysis using mathematical and statistical techniques. Data analysis in this study was assisted by using VOSviewer (visualization of similarities viewer) software to visualize and map data. This research is carried out based on the research procedure or steps set out in the study. In this study, the researcher conducted a study with a literature study method on research on self-regulated learning of science for Elementary School Students periode 2017-2021.

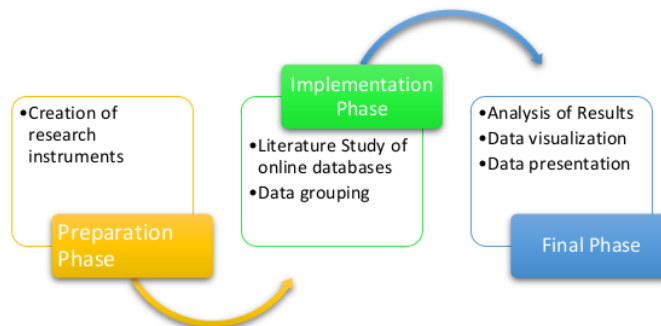


Fig. 1. Research Phase

Result and Discussion

The results of research data on self-regulated science learning for elementary school students for the 2017-2021 period were carried out with the help of Publish or Perish software and manual searches using Google Scholar. A search using the Publish or Perish software was carried out to collect data on the google scholar and scopus data base by entering the keyword self-regulated learning science for elementary school students and the research year from

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2017-2021. Research on self-regulated science learning for elementary school students has been carried out a lot and has developed every year. During 2017 to 2021 there were a number of research publications. The results of a research search on self-regulated learning of elementary school students' science in 2017-2021 on the Google Scholar database showed a total of 1940 research publications. These numbers are the numbers that arise in relation to the variables of self-regulated learning, science, students, and elementary schools. Based on these data, the relevance of research publications is only found in the initial page. The number of relevant research publications after sorting the data. Research on self-regulated science learning of elementary school students for the period 2017-2018 on the Google Scholar database and Scopus assisted by Harzing's Publish or Perish software surfaced 144 research publications on the Google Scholar database and 6 research publications on the Scopus database. The search result data is data that has not been sorted and still consists of various types of non-journal publications. The results of the researcher's search data are known that the search result data is also mixed with other variables. Through the selection of data, it was concluded that the lower the level of relevance of search data to the topic of self-regulated learning science Elementary school students, the lower it is. Based on this, the results of research data on self-regulated learning for the period 2017 to 2021 after di sort can be seen in Table 1.

Table 1. Data on Search Results for Research Publications

No.	Year	Quantity and Type							Non Sinta	Total
		³⁴ International Journals	National Journal S1	National Journal S2	National Journal S3	National Journal S4	National Journal S5			
1	2017	1	1	4	5	5	1	4	21	
2	2018	1	1	3	4	7	3	6	25	
3	2019	1	2	2	5	4	4	4	22	
4	2020	4	1	1	8	2	1	0	7	
5	2021	1	1	1	6	3	2	3	17	
Sum									102	

Table 1 contains the development of research on self-regulated science learning for Elementary School Students for the 2017-2021 period. The total number of research publication data is 102 publications divided from 2017 to 2021. Based on the graph, it can be seen that the number of research publications on self-regulated learning has increased in 2017 and 2018. The decline in research publications in a consistent n manner in 2019 and until 2021 with a stable number in 2020 and 2021.

Based on the data, the highest number of publications was in 2018 with 25 publications and the lowest number in 2020 and 2021 with a total of 17 research publications. The next number was in 2019 with the publication of 22 studies and 21 publications in 2017. Based on

these data, it can be concluded that the number of research publications on self-regulated science learning for elementary school students for the 2017-2021 period has increased and decreased by a small margin. The difference in the number of publications was highest in 2018 and in 2021 as many as 8 research publications.

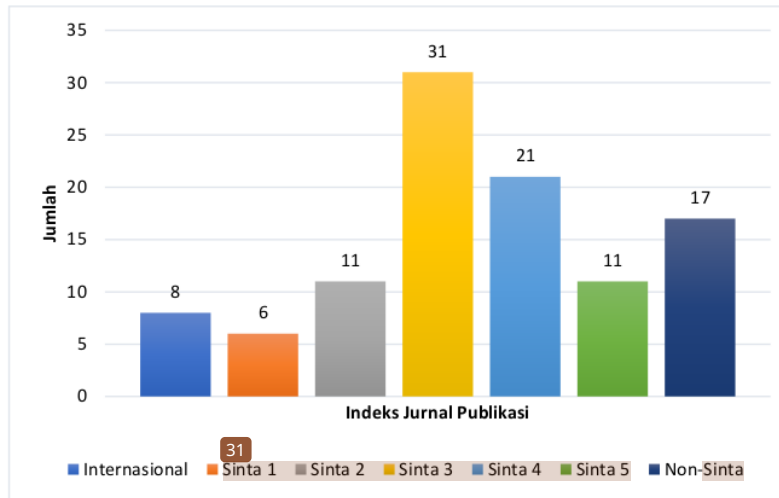


Fig. 2. Research publications by index

Based on Fig. 2, it is known that the most indexation is in Sinta 3 with 31 studies and followed by Sinta 4 with 21 publications. The number of journals that have not been accredited to Sinta, scopus, and other indexers amounts to 17 publications or occupies the third position. The indexation of Sinta 2 and Sinta 5 occupies the 4th position with 11 publications. Research publications in accredited journals on international indexers as many as 8 publications rank 5th. The last order is the indexation on Sinta 1 with a total of 6 research publications. The order of the number of indexations of research publications varies each year.

Research publications in national journals are research published in journals published in Indonesia. The number of research publication data on self-regulated learning of science students in the basic science period for the 2017-2021 period published in national journals is 94 research publications in 59 national journals. National journals whose number of publications are related to self-regulated science learning of elementary school students the most during the period 2017-2021 can be seen in Table 2.

Table 2. National Journal

No.	Journal Name	Accreditation	Sum
1	Basicedu Journal	Synta 3	11
2	3)lpit of PGSD Undiksha	Synta 3	5
3	Educational: Journal of Educational Sciences	Synta 4	43
4	3)urnal of Basic Education	Synta 4	4
5	Journal of Education : Theory, Research and Development.	Sinta 2	3
6	59)onesian Science Education Journal	Sinta 1	3
7	3)ndasi: Indonesian Journal of Basic Education	Sinta 5	3
8	Scholaria: Journal of Education and Culture	Synta 3	3
9	Biosphere: Journal of Biology and Biology Education	Sinta 2	2
10	Scientific Journal of Primary School Teacher Education	Sinta 4	2

The number of publications in international journals is 8 research publications spread throughout the 2017-2021 period in 8 different journals. The distribution of publications and international journal indices containing research publications on self-regulated science learning for elementary school students for the 2017-2021 period can be seen in Table 3.

Table 3. List of International Journals

No.	Journal Name	Index	Sum
1	Journal of Physics: Conference Series	Scopus	1
2	Acm International Conference	Scopus	1
3	Data in Brief, Volume 33 48	Scopus	1
4	International Electric Journal of Elementary School	Scopus	1
5	International Journal of Innovation, Creativity, and Change	Scopus	1
6	Journal of Turkish Science Education	Scopus	1
7	Universal Journal of Educational Research	Scopus	1
8	Vilnus Tech Journal	DOAJ	1
Sum			8

Based on Table 3, the highest number of publications in the Journal of Physics with a total of 3 publications in 2020. Other journals that contained publications in 2020 were Data in Brief, Universal Journal of Education, and Journal of Turkish Science Education. Publication in the International Electric Journal of Elementary in 2017, publication in the International Journal of Innovation, Creativity, and Change in 2019, publication in the Vilnus Teach Journal in 2021.

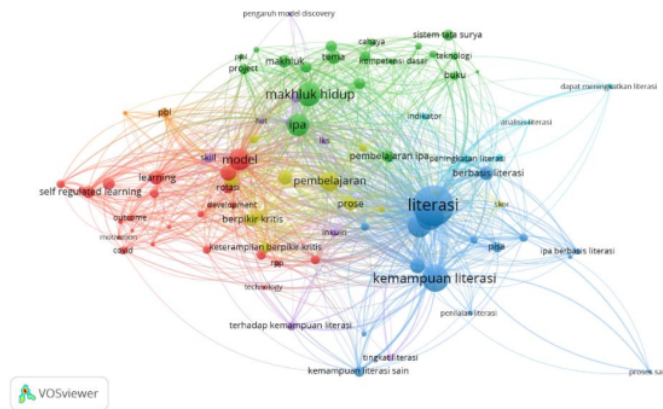


Fig. 3. Visualization of Research Publications on VOSviewer software

Based on Fig. 3, research publications on self-regulated learning are divided into 7 clusters. The clusters are cluster 1 with red color, Cluster 2 colors, Cluster 3 colors, Cluster 4, Cluster 5, Cluster 6, and cluster 7. Each cluster contains different items related to research data on self-regulated science learning for Elementary School Students for the 2017-2021 period.

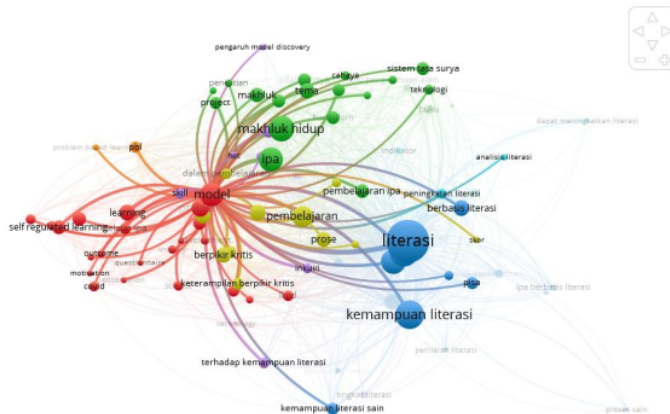


Fig. 4. Cluster Visualization 1 Node in Red

VOSviewer Visualization of The Development of Research Publications on Self-Regulated Learning science of Elementary School Students for the 2017-2021 period in cluster 1 with red node colors including the keywords model, self-regulated learning, model, critical thinking, critical thinking skills, motivation, and PBL. The keywords in cluster 1 are also connected to keywords in other clusters. Cluster 1 tends to contain keywords that have high

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attachment to keywords in other clusters. Based on the analysis, it can be concluded that the keywords in cluster 1 are keywords that have a high level of appearance in research publications on self-regulated science learning for elementary school students for the 2017-2021 period.

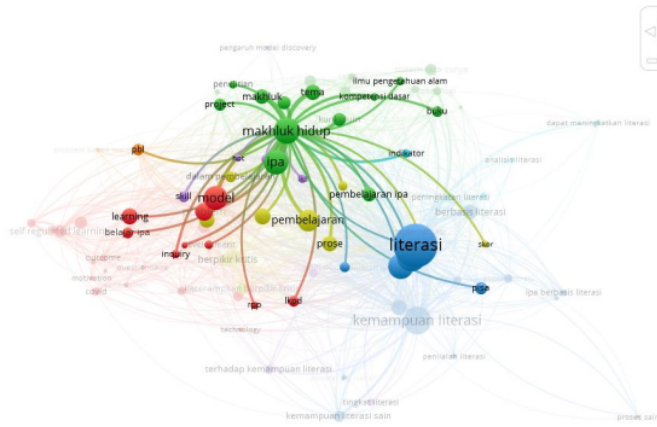


Fig. 5. Cluster Visualization of 2 Nodes in Green Color

Based on Fig. 5 visualization of VOSviewer Visualization development of research publications on self-regulated science learning of elementary school students for the period 2017-2021 in cluster 2 with green node colors containing keywords in the form of science teaching materials/ materials for elementary school students that appeared in the study. Science teaching materials that appear in this cluster include Books, Light, Natural Sciences, Science, Basic Competencies, Curriculum, Environment, Living Things, Understanding, Science Learning, Research, Book Development, PJBL, Project, Nature of Light, Properties of Light, Sistem solar system, Technology, Theme.

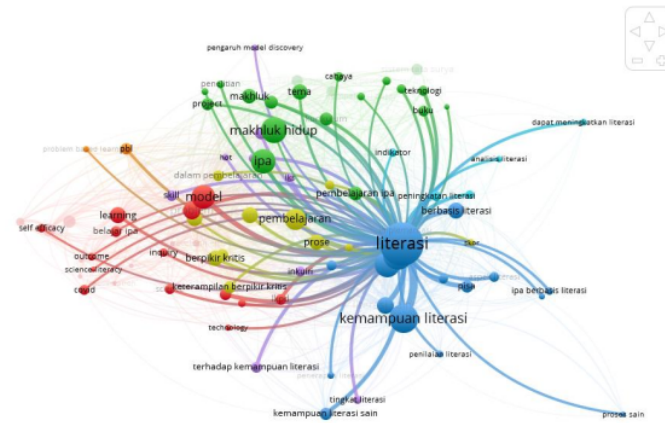


Fig. 6. Blue Node Cluster Visualization

The blue 3-node cluster raises literacy as a variable that often appears and is discussed in self-regulated science learning research for elementary school students for the 2017-2021 period. Literacy variables are then divided into literacy-based science, literacy ability, literacy analysis, literacy level, literacy assessment, science literacy ability, literacy improvement, and literacy-based science.

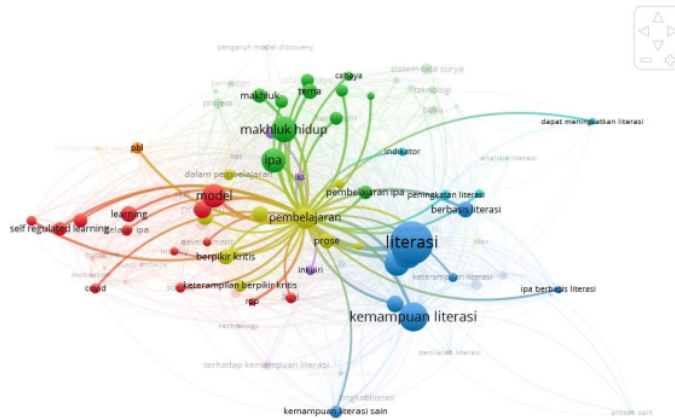


Fig. 7. Cluster Visualization of 4 Yellow Color Nodes

Based on Fig. 7 visualization of cluster 4 research on self-regulated learning science of school students dasar school period 2017-2021 it is known that this cluster contains various keywords related to learning. Keywords contained in clusters with yellow nodes include learning, processes, critical thinking skills, and various keywords connected to other clusters.

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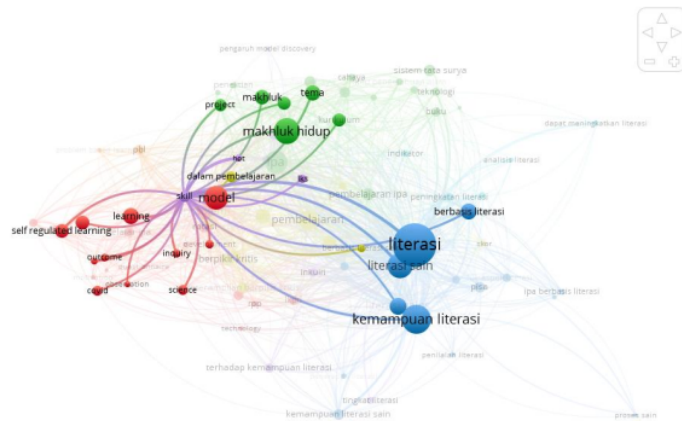


Fig. 8. Cluster Visualization of 5 Nodes purple color

Based on Fig. 8 the visualization of cluster 5 with purple node colors can be known for the keywords contained are Discovery, HOTS, Inquiry, LKS, Discovery Learning, and Skill. The keyword is then linked to a keyword in another cluster. Skill keywords are connected to various keywords in cluster 1, cluster 2, and cluster 3. Based on this, it can be concluded that the keywords contained in cluster 5 have a high level of occurrence and relationship with cluster 1, cluster 2, and cluster 3.

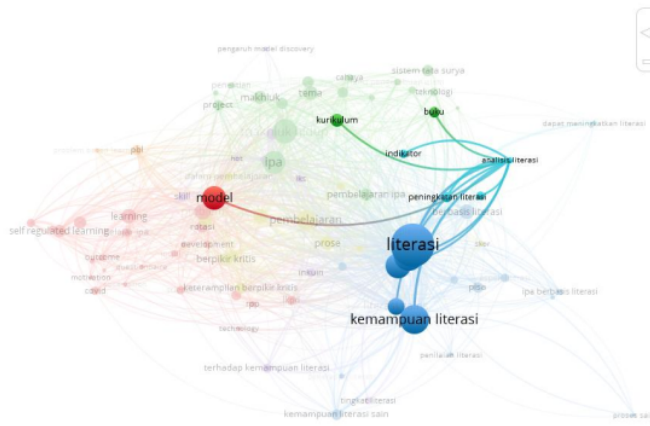


Fig. 9. Light Blue 6 Node Cluster Visualization

Fig 9 visualizes cluster 6 with a light blue node color. This cluster contains the keywords literacy analysis, literacy improvement, and indicators. The keyword is connected to the keywords contained in cluster 1, cluster 2, and cluster 3. Based on the image, the keyword

in class 6 is strongly related to cluster 3 (blue). Based on this, it can be concluded that the keywords in cluster 6 have a high degree of correlation with keywords in cluster 3.

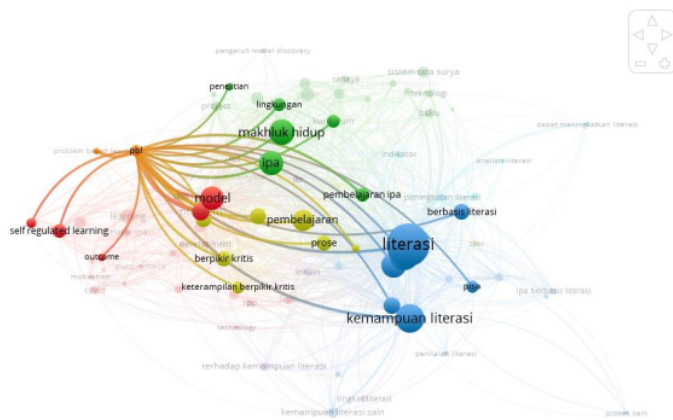


Fig. 10. Cluster Visualization of 7 Orange Nodes

Based on Fig. 10 visualizations in cluster 7 with orange node colors, it can be seen that this cluster only contains the keywords PBL and Problem Based Learning. The two keywords contained in cluster 7 are then connected to keywords in other clusters. The level of occurrence and entanglement of keywords in cluster 7 is relatively low and few.

Table 4. Items contained in the vosviewer visualization cluster

No.	Cluster	Items
1	Cluster 1 (Red Node)	Learning Science, Covid, Development, Effect, Self-Efficacy, Inquiry, Learning, LKPD, Model, Motivation, Observation, Outcome, Picture, Problem, Questionnaire, Rotation, RPP, Science, Science Literacy, Self Efficacy, Self-Regulated Learning, SRL, Technology.
2	Cluster 2 (Green Node)	Books, Light, Natural Sciences, Science, Basic Competencies, Curriculum, Environment, Living Things, Deepening, Science Learning, Research, Book Development, PJBL, Project, Nature of Light, Properties of Light, Solar system, Technology, Theme.
3	Cluster 3 (Blue Node)	Literacy Aspects, Literacy-Based, Science Literacy, Science Process, PISA
4	Cluster 4 (Yellow Node)	Critical Thinking, Skills, Learning Process, Score.
5	Cluster 5 (Purple Node)	Discovery, HOTS, Inquiry, LKS, Discovery Learning, Skill.
6	Cluster 6 (Light Blue Node)	Literacy Analysis, Indicators, Literacy indicators.
7	Cluster 7 (Orange Node)	PBL, Problem Based Learning.

Table 4 contains keywords/topics contained in each cluster in the visualization of research publications on self-regulated science learning of elementary school students for the

2017-2021 period. The topic of such publications has varying degrees of occurrence. **Table 5** contains research topics based on the degree of their occurrence.

Table 5. Publication Topic Data on self-regulated science learning for Elementary School Students in 2017-2021

No.	Variable	Occurrences
1	Ipa	64
2	Learning Outcomes	28
3	Motivation	23
4	Critical Thinking	19
5	Science Literacy	15
6	Self-Regulated Learning	13
7	Strategy	11
8	PBL	9
9	Learning Media	8
10	Science Process Skill	6
11	Inquiry	6
12	Discovery Learning	4
13	Self-Efficacy	4
14	Emotional Intelligence	1
15	Eveyone is Teacher Here	1
16	MetacognitiveNess	1
17	Practice Buddy Strategies	1

Self-regulated learning as the main topic of research has an appearance rate of 13 times. This topic trend was quite widely carried out in 2019 with a total of 6 publications containing self-regulated learning topics. The following year this research topic decreased by 4 research publications and in 2017 a total of 2 publications and 1 publication in 2018 and 2021. Research conducted by Ref. [10] related to the analysis of self-regulated learning of grade VI elementary school students in Yogyakarta shows that in general self-regulated learning students fall into the high category of cognitive indicators and self-reflection. Meanwhile, the performance indicator is still in the moderate category. Based on this, it is concluded that peru has the efforts and support of teachers, schools, parents and students to be able to improve performance in learning through the use of models, media, teacher and parent guidance, supporting policies by schools as well as a learning and supportive environment. Ref. [11] Bala, Sulisworo, and Mayani (2020) with their research entitled The analysis of self-regulation learning on Elementary Schools at the rural area in Indonesia showed results that there was no difference in students' self-regulated science learning ability in general except for students in NTT. Students in NTT have lower self-regulated learning abilities than others, so there is a need for policies and various learning strategies that can improve student self-regulated learning.

Learning outcomes are an indicator of student learning motivation [12]. This topic becomes one that has a high incidence rate. The relationship between this topic and self-regulated learning is that learning outcomes or also referred to as assignment values are the

result of the student learning process which includes learning management, motivation, and attitudes in learning. The more students are good at self-regulation, the more student learning outcomes will also increase. Based on this, the success of students regulating themselves can easily be known by looking at the student's science learning outcomes. The number of emergence of this topic can be concluded as the low self-regulation of students so that the trend of topics that raise strategies, models, and media to improve learning outcomes through bringing up student self-regulation is still widely carried out.

Critical thinking or students' critical thinking ability is also a popular topic studied with a total of 23 occurrences. The trend topic of critical thinking is part of the self-regulated learning component that is included in learning strategies and cognitive, metacognitive, and strategy sub-components [13]–[17]. The emergence of the topic of critical thinking is caused by this topic to be a reference for the existence and success of self-regulated learning in students [13], [14]. In addition to being one of the indications of self-regulated learning, another reason for the emergence of this topic is the critical thinking of students who are still low and become educational professionals who require research to present solutions. Research conducted by Reff [18]–[23] related to critical thinking skills and mastery of science shows that the PBL model shows higher results than conventional learning models.

Science literacy is the ability of students to identify, get new information, convey, and make conclusions based on existing facts [24], [25]. It is one aspect of ability in facing the challenges of the 21st century [26]. The topic of science literacy has a 19-time occurrence rate and is a topic that often appears on research publications on self-regulated learning science students. The emergence of this topic is a focus that is a need for education in Indonesia as evidence that science literacy is still relatively low [27]. The low science literacy of Indonesian students is evident from the low results of the PISA survey from 2000 to 2018. Research conducted by reff [28]–[32], improving science literacy skills can be done by innovating science learning in the form of approaches, models, media or methods to support learning.

Motivation is an individual's motivation to do something that grows within himself and can also be triggered by the environment [33]. The topic of motivation is one of the main components of self-regulation in learners proposed. The emergence of motivation is directly related to learning outcomes and student attitudes. The greater the motivation that exists in students, the higher the attention and enthusiasm of students in learning so as to produce high learning output. Students with self-regulated learning skills are able to generate learning motivation by themselves, but motivation can also be grown and supported by the learning environment and learning strategies.

The topic of strategy and learning media is a popular topic and is a topic that never escapes during the learning process. Learning strategies are steps taken to support students to achieve learning goals. The results of the analysis of several learning strategies succeeded in fostering self-regulated learning skills that can be seen from the improvement of student science learning outcomes. Research conducted by Reff [34] is related to the quiz team's active learning strategy that the strategy is able to improve student learning outcomes. Learning Media is a medium used in learning as a reinforcement of the material taught. Learning media is also a device that never escapes throughout the learning process. The topic of learning is one of the topics that deserves to be carried out in-depth research related to self-regulated learning. Learning media is also a topic that will not be obsolete because there will continue to be innovation.

Science Process Skills or science process skills are students' scientific skills which include cognitive and intellectual skills. Science process skills have an important role in science learning because they are able to lead students to achieve learning goals [35], [36]. The existence of students' science process skills cannot be separated from students' self-regulated learning. Science process skills are part of the strategy subcomponent and organizational aspects. Science process skills allow students to process information that is then developed based on existing facts. This topic deserves to be used as a research topic to support self-regulated learning of students in science learners.

Self-Efficacy is a self-confidence to perform or complete a certain task [37], [38]. The topic of self-efficacy is still rarely done and deserves to be used as a research topic in the future. Self-efficacy is part of the indicators of self-regulated learning according to Pintrich's theory [39]. Self-efficacy is part of the indication of the presence of a motivational component and enters in the subcomponent of expectancy (expectations). The high self-efficacy in students has an impact on students' science critical thinking ability, this assumption is supported by research conducted by Reff [39]. Research conducted by Reff [40] related to self-efficacy and parental involvement in education with self-regulated learning shows the results that the existence of self-efficacy makes it easier for students to regulate the learning process. The results of research conducted by Reff [41] related to experimental methods and self-efficacy of science process skills showed that there were differences in science process skills different between high self-fiction students and low self-fiction students.

Emotional Intelligence or emotional intelligence is the ability to manage and control emotions [42]. This topic only appeared once in the publication of research on self-regulated learning of science of elementary school students during the period 2017-2021. This topic is a topic that deserves to be researched in the future because it is related to management and student attitudes in the learning process. Students' self-regulated learning ability is

inseparable from emotional intelligence, because the better the student's emotional management, the greater the regulatory ability they have.

Metacognitive skills are students' skills in planning, monitoring, and evaluating learning. Metacognition skills are part of self-regulated learning in the components of learning strategies [43]–[45]. The presence of metacognitive skills indicates the existence of self-regulation in learners. Metacognitive skills allow students to have awareness and understanding of the processes and potential possessed. The metacognitive process includes the objectives of cognitive activity during the process of achieving learning goals. This topic has the potential to be carried out with the aim of knowing metacognitive skills in students or bringing up metacognitive naturalness through combination with the topic of science strategy and learning media .

Peer learning is a peer tutor concept where friends at the same grade level play a role as teachers for other students. Based on research conducted by Arjangi (2010) peer learning methods have a contribution of 17.4% in improving learning outcomes based on self-regulation [46]. Based on this, it can be seen that peer learning is able to bring out self-regulated learning in students whose results can be known through learning outcomes. Research conducted by Ref [47] showed that the peer tutorial method was able to improve student regulation which was characterized by an increase in learning outcomes where initially only 45.83% of students reached KKM in science subjects, in the first cycle it increased to 66.66% and in cycle 2 to 87.5% of 24 students exceeded KKM.



Fig. 11. Visualization of VOSviewer Co-Author Research

Based on Fig. 11, there are several researchers who are interconnected. This connection is due to research conducted jointly between researchers. The name of the *Literature Study on Self-Regulated Learning in Science Learning of Elementary School Students (Ramadhani et al.)*

researcher that appeared on Fig. 11 indicates the researcher with the highest number of publications. The number of research publications and the strength of the peneliti relationship can be seen in Table 6.

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Table 6. Co-Author Data on Research on Self-Regulated Learning

No.	Author	Document	Total Link Strength	Agency
1	Fakhriyah, Fina	2	14	Holy Muria University
2	Niswatuazzahro, Vivi	2	14	Holy Muria University
3	Rahayu, Ratri	2	14	Holy Muria University
4	Seftia, Ifa	2	4	PGRI Ronggolawe University
5	Sri, Cacik	2	4	PGRI Ronggolawe University
6	Winata, Graceful	2	4	PGRI Ronggolawe University
7	Akip, M	2	2	STKIP Melawi
8	Fitria, Yanti	4	2	Padang State University
9	Martini, Sri	2	2	Padang State University
10	Maryani, Ika	3	2	Ahmad Dahlan University

5
Based on Table 6, it is known that the author with the highest number of publications is Fitria with 4 research publications and followed by Maryani with a total of 3 studies. Other studies have a total number of publications of 2 publications, in addition to the name of the peneliti contained in Table 6 has a number of publications of 1 study and has no connection with other studies. Based on research institutions, the largest contributors are Muria Kudus University, PGRI Ronggolawe University, and Ganesha University of Education with a total of 3 authors in each institution and Ahmad Dahlan University contributed 2 authors.

24 Conclusion

Based on the results of the research that has been carried out, it can be concluded that there are 102 research publications on self-regulated science learning of elementary school students in the 2017-2021 period. Through the analysis of 102 studies, there are 42 research topics that have different levels of appearance. The trend of research topics on self-regulated learning in science for elementary school students for the 2017-2021 period with high levels of emergence is (1) Self-regulated learning, (2) Learning Outcomes, (3) Critical Thinking, (4) Sains Literacy, (5) Motivation, (6) PBL, (7) Inquiry, and (8) Discovery Learning. The research topic is a topic that exists in research publications every year. In addition, there are several topics related to self-regulated learning science for elementary school students who have a low level of emergence, including: (1) Strategy, (2) Learning Media, (3) Science Process Skills, (4) Self-Efficacy, (5) Emotional Intelligence, (6) Metacognitive Skills, and (7) Peer Learning. The research topic with a relatively low level of emergence can be used as a reference for formulating the next self-regulated science learning research for elementary school students.

Conflict of Interest

The authors declare that there is no conflict of interest.

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