How is the Development of science Education in Primary Schools'conflict Resolution?

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Abstract

Science education in elementary schools is not only concerned with numbers, formulas and laboratory experiments, but includes various phenomena that often occur in the surrounding environment so that it has an impact on increasing the development of science education in resolving conflicts in elementary schools. This study aims to analyze the publication of science education in primary schools' conflict resolution using VOSviewer with a publish or perish application with a range of publications for ten years (2013 to 2023). Based on these criteria, there were 992 articles found into three areas that is Conflict Resolution, Science Education, and Primary School terms. The research results show that research has decreased significantly in the last 5 years, namely from 2013 to 2019 with a total of 205 articles down to 54 articles. From 2019 to 2022 there will be static for the publication of articles on this topic. A drastic decline has occurred in the last 2 years, namely from 2021 to 2022, with a total of 9. The latest data in 2023 saw an increase of 1 article to 10 published articles. So that it can be said that it was decreasing. Through VOSviewer, this study analyzes a lot of articles published related to the topic itself. The impact of this review becomes a reference for a starting point in conducting research on related topics in the future.

Keywords: Conflict Resolution; Science Education; Primary School.

Science discusses natural phenomena that occur around us . Science education is not only concerned with numbers and formulas as well as laboratory experiments, but science education covers a broad range of phenomena that often occur in the surrounding environment in everyday life [1]. Science education studies the processes, methods, attitudes, skills, and products of science or scientific work [2].

Elementary school age is categorized as developing individuals who have characteristics that show a lot of differences. This can lead to friction that causes conflicts in school, especially elementary school such as fighting over toys, feeling not appreciated, and not accepting other opinions. Education has not provided a significant role in character building and social skills, especially in educational institutions

including elementary schools. When schools become a place for dispute rather than a joyful place, it can affect the education quality, of particularly it can lower the process and performance of students' learning [3]. This is the area where schools can give supervision and guidance optimally to solve problems. Conflict resolution education emphasizes the skill to see other people's points of view and resolve differences peacefully to help someone live in a multicultural world [4]. Social issue development related to conflict that happened in elementary school needs some solution through research.

There is an analysis technique that can be used to see the development of research in science education in primary schools' conflict resolution field. This technique is known as Bibliometric Analysis which is a meta-analysis of research data that can help researchers in studying bibliography content and quotation analysis from articles that are published in journals and other scientific works. Based on the findings of the analysis, we examined bibliographic data from publications between 2013 and 2023 to see whether bibliometrics on this social science education in elementary school topic is successfully developing internationally. The following table 1 explains the results of the discussion of topics from bibliometric research on the findings of the previous analysis.

Table 1 The latest research on bibliometrics in the field of science education in primary schools' conflict resolution.

No.	Title	Topic Discussion	Ref
1.	A bibliometric analysis of Covid-19 researches using VOSViewer.	This paper is to examined the evolution of research during the Covid-19 era using VOSViewer	[5]
2.	Examining the Trend of Research on Active Engagement in Science Education: Bibliometric Analysis	This paper will examine and report on Scopus-indexed articles on active engagement. This article summarises the research productivity, most active source title, distribution of publications by countries, most active institutions, most productive authors, and citation analyses using established bibliometric indicators.	[6]
3.	Research Trends on the Use of Technology in Early Childhood Science Education: Bibliometric Mapping and Content Analysis	This study is to identify research trends from 2011 to 2020 through bibliometric mapping and content analysis of articles on the use of technology in early childhood science education.	[7]
4.	Hot Topics and Frontier Evolution of Science Education Research: a Bibliometric Mapping from 2001 to 2020	This paper presents a study to analyze, synthesize, and visualize the hot topics as well as the frontier evolution of science education	[8]
5.	Map of Scientific Publication in the field of Educational Sciences and Teacher Education in Turkey: A Bibliometric Study	This study aims to create a map for the scientific publications in the field of educational sciences and teacher education in Turkey	[9]
6.	Trends and Issues in Science Education in the New Millennium: A	This study used bibliometric data to understand the topics that the articles in the Journal of Research in Science Teaching (JRST) focused on over the last 20 years.	[10]

	Bibliometric Analysis of the JRST		
No.	**Title**	**Topic Discussion**	**Ref**
7.	Bibliometric and Content Analyses of Articles Related to Science Education for Special Education Students	This study was to reveal trends of articles related to science education for special education students published in the SSCI journals	[11]
8.	Science Education Research within TPACK Framework at a Glance: A Bibliometric Analysis	This study aims to present a summary of science education research within the TPACK framework regarding the number of annual productions, the most influencing authors and productive countries, the co-authorship collaboration, and research foci	[12]
9.	A bibliometric and descriptive analysis of inclusive education in science education	This article aims to map the scientific production concerning the inclusion of people with disabilities in Science Education to promote a reflection on the production of this area.	[13]
10.	Dental suction aerosol: Bibliometric analysis.	The distribution of bibliometrics maps and research trends using VOSviewer about to explain the evolution of dental aerosol suction.	[14]
11.	The latest report on the advantages and disadvantages of pure biodiesel (B100) on engine performance: Literature review and bibliometric analysis	This study aims to present the literature on the benefits and drawbacks of pure biodiesel on engine performance.	[15]
12.	A bibliometric analysis of management bioenergy research using VOSviewer application	This paper focused to examined research trends and developments in the field of bioenergy management.	[16]
13.	Research trends and issues of engineering design process for STEM education in K-12: A bibliometric analysis.	The study performed a bibliometric analysis of research literature related to the 'engineering design process' (EDP) that has emerged as a popular approach for STEM education in K-12	[17]
14.	A Bibliometric Analysis Of Using Web 2.0s In Educational Research Area	The paper to present study is to reveal the tendency towards Web 2.0s in the educational research area with the analysis of bibliometric mapping	[18]
15.	Oil palm empty fruit bunch waste	This study aims to the use of benzotriazole ionic salt liquid	[19]

However, the bibliometric analysis of publication data using computational mapping in science education in primary schools' conflict resolution field that was done specifically for knowing the research development in this field has not been done much. Especially bibliometric analysis for the last ten years from 2013 to 2023 using the VOSviewer application.

Therefore, this study was done to analyze the computational mapping analysis on Google Scholar-indexed articles using VOSviewer. This study was expected to become the reference for future research in deciding the research theme related to science education in primary schools' conflict resolution.

Methodology and Procedures

The study uses a method of bibliometric analysis with two purposes: (1) to provide the latest publication trends on scientific education in conflict resolution in primary schools over the past ten years (2018-2023) and (2) to understand

the latest portraits of publications on scientific education in the resolution of conflicts in elementary school in particular. The technology development trend map data for publications was analyzed using VOSViewer software [41-42]. (xxx)

The first phase focuses on collecting data using Publish or Perish software and will be stored in two formats: *.ris (for mapping data with the VOSviewer program) and *.csv (for processing data in Ms. Excel) and processing search results using VOSViewer to generate data visualizations to the first goal. The second phase deals with searching papers from the Google Academic database to specifically investigate emerging trends in science education in conflict resolution in primary schools. Google Scholar is used because the database contains a bunch of articles published in various scientific journals. First, the search strategy is defined to obtain relevant papers from the database using specific search terms such as "science education" OR "conflict resolution" OR "in primary school". Second, the papers data generated from the databases are collected for further analysis. The flowchart of the data selection process is described in Figure 1.

Fig. 1. The flowchart of the data selection process

1.1. Tools and Materials

The first step in conducting a bibliometric analysis is to make the appropriate preparations for the tools and resources to be used in the analysis. Data on search results must be prepared for the following applications: Publish or Perish (PoP), which is used to find and collect article data based on keywords, Microsoft Excel, which is used to analyze and screen search result data, and finally VOSviewer, which is used for visualization and mapping.

1.2. Data Collection

In this step, the information based on the keywords used for publishing trend analysis is gathered. The Publish or Perish program has been used to collect published articles on the topics of "Sains Education", "Conflict Resolution", and "Elementary School", were gathered. Article data from the most recent ten years, from 2013 to 2023, comprise the data collected.

1.3. Harvesting and screening data

The first search yielded 1000 papers related to scientific education in conflict resolution in primary schools over the past ten years (2018-2023) using the Publish or Perish tool. All entries were first processed by using VOSViewer to generate a general visualization. All entries were then cross-checked to the Google Scholar as the main database and to ensure whether the papers showcase the criteria determined earlier. All entries that have been cross-checked were analyzed further to match the titles with the predetermined criteria. At this stage, forty-six (46) branches are related to scientific education, conflict resolution processes, dispute resolution strategies and science education subjects.

1.4. Data Visualization

To obtain data visualization, data that has been saved in the (*.ris) format is then submitted to the VOSviewer program. The terms in the VOSviewer network mapping visualization are filtered at this stage. The article data is mapped based on the source database. This study uses three different methods of visualization, namely network visualization, overlay visualization, and density visualization.

1.5. Data Analysis

In the last stage, the visualized data was analyzed to provide results that will be discussed in the "results and discussion" section. The data analysis procedure was simplified by using the features of Microsoft Excel.

Results

Based on the data collection through Publish or Perish software in the Google Scholar database, 992 articles met the research criteria. The data collected was article metadata that consisted of author names, title of the article, publication year, journal name, publisher, number of citations, article link, and related URL. Table 2 shows some publication data used in the VOSviewer analysis in this research. The data sample obtained was the 5 best articles that have the most citations. The number of citations from all the articles in this research was 336209, citations per year was 33620.90, citations per article was 338.92, the average amount of authors in the article was 2.78. All the articles have an average h-index of 320, and g-index was 502.

The scholarly work that has garnered the most number of citations in the field of conflict resolution responses within the domain of science education is the publication titled "2013 AHA/ACC/TOS Guideline for the Management of Overweight and Obesity in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and The Obesity Society", authored by Jensen et al. [20]. This document has received a total of 5031 citations. The article titled "Innovation and Creativity in Organizations: A state-of-the-science Review, Prospective Commentary, and Guiding Framework" authored by Anderson et al. [21] has garnered significant scholarly attention, being the second most referenced publication in its field. It has accumulated a total of 4052 citations. The document titled "Consensus statement on concussion in sport—the 5th international conference on concussion in sport held in Berlin, October 2016" authored by McCrory et al. [22] holds the distinction of being the third most often referenced publication. It has garnered a total of 3899 citations. The three most frequently cited documents exhibit similar levels of citation, while the fourth most cited publication, "Ensuring the quality of the findings of qualitative research: Looking at trustworthiness criteria" by Anney [23]. Table 3 shows the development of science education in primary schools' conflict resolution research that was published in a Google Scholar-indexed journal. Based on the data displayed in Table 2, there are 992 articles related to conflict resolution education that were published around 2013-2023. In 2013, there were 205 articles published while there were 174 articles published in 2014. In 2015, there were 142 articles while 133 articles were published in 2016. Articles published in 2017 were 104 articles and in 2018 there were 83 articles. 54 articles were same published in 2019 and 2020. In 2021, there were 9 articles and in 2022 were only 10 articles. From this result, it shows that research on conflict resolution education is not often studied in every year, especially in the last 10 years (2013-2023). The development also fluctuates as seen in Figure 2. Table 3 shows the development of research science education in primary schools' conflict resolution.

Table 3. Development of Research on science education in primary schools' conflict resolution

Year	Article Published
2013	205
2014	174
2015	142
2016	133
2017	104

2018	83
2019	54
2020	54
2021	24
2022	9
2023	10
Total	**992**
Avg	**90.18181818**

Figure 2 shows the development of research on science education in primary schools' conflict resolution for the last ten years ranging from 2013 to 2023. Based on Figure 1, the development of the research related to the topic dropped drastically in 2013-2018. The derivation was seen from the number of publications where there were 205 articles published in 2013 while there were only 83 articles published in 2019. However, from 2019 to 2020, the number of publications is the same as 54 articles. But It fluctuates from 2021 to 2022 before it drops drastically in the last two years where in 2021 were 24 articles, 2022 were 9 articles. The data shows the popularity of research on science education in primary schools' conflict resolution was not stable as in 2023 until the mid-year only 10 articles were published and it can be said that the popularity is increasing.

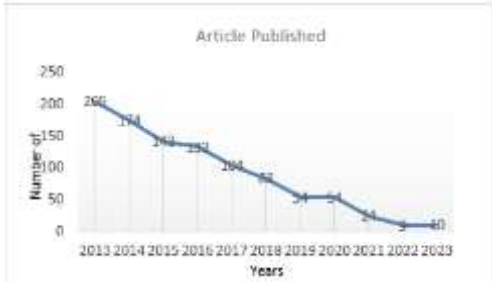

Fig. 2. Research development on science education in primary schools' conflict resolution

Network visualization (see Figure 3) of the topic areas studied in each cluster. Visualization of conflict resolution education in elementary school topic terms.

Computational mapping was done toward the article's data. VOSviewer was

used as the tool for this analysis.

The total strength of terms with the keywords "conflict resolution, science education, and primary school" shows the results of segmenting 46 item visualization cluster categories into 6 clusters, which are presented in Table 4.

Table 4 Network visualization of science education in primary schools' conflict resolution

Cluster	Item	Color	Total Link Strength	Occurrence
Cluster 1 (11 item)	Argument, attitude, case, engineering, issue, math, primary school, science teaching, teacher, teacher education, value	Red	251	254
Cluster 2 (10 item)	Addition, community, conflict management, field, future, future research, opportunity, political science, social science, understanding	Green	151	200
Cluster 3 (8 item)	Influence, mediation role, mediation effect, mediation model, mediation role, quality, relationship, self-efficacy	Blue	285	229

Cluster 4 (6 item)	Creativity, framework, innovation, moderated, mediation model, process, relation	Yellow	154	144
Cluster 5 (6 item)	Academic achievement, child, effectiveness, meta-analysis, web.	Purple	142	140
Cluster 6 (5 item)	Country, depression, grade, mathematics, mediation analysis	Turquoise	113	102

Table 4 outlines the networks obtained from the Vosviewer application with the keywords of science education in conflict resolution in primary schools. The network is divided into six sections: cluster 1, there are 11 items: Argument, attitude, case, engineering, issue, math, primary school, science teaching, teacher, teacher education, value (see Figure. 3 & Figure 9. Learning through argumentation will train students to think critically, evaluate evidence or advice and make decisions [24]. In other words, learning science using an argumentation approach can be carried out by raising a particular topic of problem. Then students are asked to construct statements and explanations by adding data and supports that form ideas, ideas or decisions based on the basic scientific knowledge and theory they possess as it is that any science education should direct on the ability to argue. In line with that, science learning must be able to link the concepts of science with the emerging social issues in society. This kind of problem is known as a socio-scientific issue. (socioscientific Issue). By introducing and discussing socio-scientific issues in science learning, that is to say, making social science issues the main content of the learning material, students are able to develop argumentative skills. Argumentation skills are required to make wise decisions based on the scientific knowledge acquired by students in dealing with various socio-scientific issues [24-28].

Moreover, science learning plays an important role in preparing students for various aspects of their future lives, such as logical and critical thinking, decision-making involving scientific information both individually and as craftsmen, and, most importantly, making science their profession. In studying science, students need to involve the skills of asking questions, generating data, interpreting facts from direct research or from text, and making explanations based on evidence. At the same time, students should also be supported to develop an understanding of the content of science. Science learning is not enough to be taught about the concepts of science alone, but rather science concepts must be prepared to answer the problems of everyday life. Therefore, it is important to use socio-scientific problems in learning. By using socio-scientific problems in learning, will improve student understanding of science concepts related to values and other sciences [29, 30]. Socio-scientific problems will help teachers guide students to understand problems in a multi-perspective [31]. In the framework of socio-scientific problems, students expose problems explicitly or implicitly, by involving differences in social, moral and scientific concepts, either on a problem that matches or contrasts with students' beliefs [32]. Students will be more motivated in science learning to engage actively in submitting opinions in discussions on controversial topics through their experience. The combination of science concepts and socio-scientific problems is an effective way to engage students in discussion and develop students' ability to make decisions and think critically. The socio-scientific problems in the pedagogical context develop cross-disciplinary knowledge, values and ability to argue. In the learning of science, socio-scientific problems derive from moral and ethical values that are based on complex scientific issues in which the sociological problems become the main aspects that will provide the context of

argumentation. So it can be said that the networks present on cluster 1 focus that science education taught by teachers to elementary schoolchildren seeks to improve the skills in argumenting, behaving, and being able to solve scientifically and socially issues in everyday life. In other words, science education has meaning and value to be taught to children.

The mapping visualization analyzed in this study on cluster 1, (see Figure. 3)

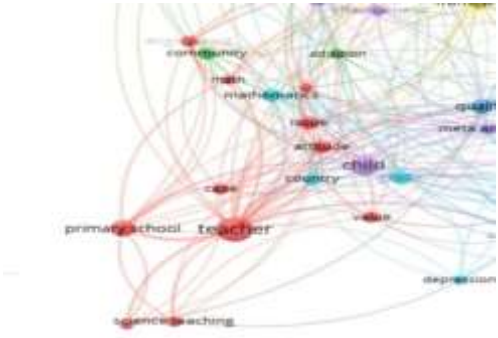

Fig. 3. Visualization of keyword cluster 1

Addition, community, conflict management, field, future, future research, opportunity, political science, social science, understanding marked in green (see Figure. 4 & Figure. 9). Networking on cluster 2 on science education in conflict resolution in elementary schools emphasizes community in society and conflict management. Conflict management enables employees to interact with others in the right way, complete work and do work properly with others efficiently, and have a better working life in the organizations of society [33]. Individuals use different styles to deal with conflict, and these styles vary for each individual. Conflicts arise for several reasons, some of which include inappropriate objectives, different values and beliefs, ambiguities and role conflicts, communication problems, unambiguous regulations, conflicts of authority, inconsistent evaluation and reward systems, work pressure, job conflict, lack of information systems, and others. This in turn can affect the satisfaction of leaders and parties in society [34-35]. The existence of different people with different demographic characteristics, personalities, needs, expectations and different perceptions is a cause of conflict within organizations in society, including educational institutions [36-37].

Factors underlying the emergence of interpersonal conflict in organizations in society include: 1. Simple problem solving. The focus is on solving problems and people do not get the main attention. 2. Adjustment/compromise. Both parties are willing to give and take, but do not always focus directly on the real problem. Be aware of emotional issues that are never brought up to the manager. Sometimes both parties remain dissatisfied. 3. Disagree. This level of conflict is characterized by contested opinions. Take a stance of keeping your distance. As managers, managers need to utilize and demonstrate the healthy aspects of disagreement without allowing divisions within the group. 4. Lose/win. This is a disagreement accompanied by a very strong competitive attitude. At this level, other people's opinions and ideas are often less valued. Some of them will use various methods to win the fight. 5. Fight/flight. This is a “mysterious shooter” conflict. The people involved shot each other at close range then retreated to save themselves. When anger explodes, emotions overtake common sense. People disagree with each other. 6. Stubborn. This is a “my way or no way” mentality. The only saving grace in this conflict is that it usually sticks to logical thinking. Nevertheless, there was no compromise so there was no resolution. 7. Denial. This is one of the most difficult types of conflict to overcome because there is a lack of open and frank communication. Conflict is just suppressed. Unspeakable conflict is conflict that cannot be resolved [38]. These details form the basis for future research, especially in science and social education which leads to politics in the future.

Successful education in the 21st century depends on the acquisition of competencies and not conceptual learning. 21st century skills focus

on students' skills in collaboration, listening to other people's opinions, thinking critically, being creative, and having high initiative and participation, being able to solve problems, taking risks in making good decisions and managing and controlling emotions, these are things - things that are considered important in lifelong learning. Understanding science education is very important, to face big challenges, namely the development of sustainable development (SDG's) such as climate change, human health and healthy living, food and water security or sustainable cities that occur around [39]. So you can see the interconnectedness of the network in cluster 2 to resolve conflicts based on the viewpoint of science education in the form of conflict management, community, politics and future research.

The mapping visualization analyzed in this study on cluster 2, (see Figure. 4)

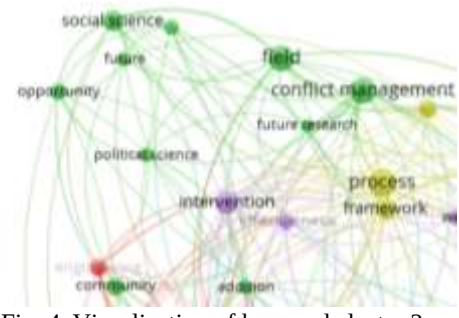

Fig. 4. Visualization of keyword cluster 2

The network division obtained in cluster 3 contains eight elements namely Influence, mediation role, Mediation effect, mediations model, mediating role, quality, relationship, self-efficacy marked in blue. (see Figure. 5 & Figure 9). Networking on cluster 3 on science education in conflict resolution in elementary schools emphasizes mediation. Mediation is a form of dispute settlement involving third parties to help the parties to a dispute reach agreement, in which two or more people jointly try to find a solution that can be implemented and carried out fairly. In addition, mediation is a form of negotiation between two individuals (or groups) involving third parties with the aim of helping to reach a compromise settlement. Mediation is the activity of bridging two parties to a dispute in order to produce an agreement [40-42].

In Indonesia, through the entry into force of some legislative provisions in Indonesia such as Act No. 30 of 1999 on Alternative Dispute Resolution and Supreme Court Regulation No. 1 of 2016 have begun to promote mediation as an ideal solution. There are several reasons why mediation is an ideal alternative to dispute resolution because: 1. Cheaper costs and less time 2. More persuasive approach supported by a coherence respected by both sides of the conflict. 3. Wider, comprehensive and flexible discussion of issues. 4. Maintain good relations between the two sides in the dispute. Mediation is considered to be more effective in resolving disputes/conflicts in Indonesia. Indeed, the concept and value of mediation has long been known to the Indonesian nation, which is the idea of achieving mutual affairs [43].

If seen on science education in Indonesia in resolving conflicts related to the current phenomenon of Sustainable Development for Education is crucial and can build Indonesia towards a better country for future generations.The goal of this fourth SDGs is to improve the quality of education in Indonesia, which is underestimated, not only in the facilities the role of teachers is also important for the New Generation, because they are the example of its students. Building a quality education will create a State with a bright future that guarantees that all girls and men complete primary and secondary education without charge, equal and quality, leading to access to relevant and effective learning, building child-friendly educational facilities, welcoming the disabled, and building a secure learning environment for all, ensuring equal access for all women and men, to affordable and qualified technical, vocational and higher education, including

universities, significantly increasing the number of young people and adults with relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship [44-45].Based on these phenomena, the role of science education in solving problems is very important where, requiring several related parties in various sectors, but in the scope of education, schools become the primary place of teacher management in conflict resolution where the teacher class can be done in a variety of ways. Establish or organize a learning environment that encourages students to engage in group dialogue on the content of science education. Teachers also give students the opportunity to practice and reason to choose conflict resolution strategies without violence rather than aggression and violence. A friend-to-girl mediation program for troubled students is one of the programs that can be developed in schools. With the help of a mediation trainer/tutor, and can be carried out at the mediation yard. Support from the school community is crucial in this program, be it teachers, parents, students, and staff. Adult mediation programs can be designed to deal with conflicts between adults and sometimes between students and teachers. These programs require adults with mediation training similar to the one given to students. Various conflicts, including probadian clashes, disagreements about disciplinary action, the development of programs for children with special needs, bolos, and disputes related to cultural differences [46].

The mapping visualization analyzed in this study on cluster 3, (see Figure. 5)

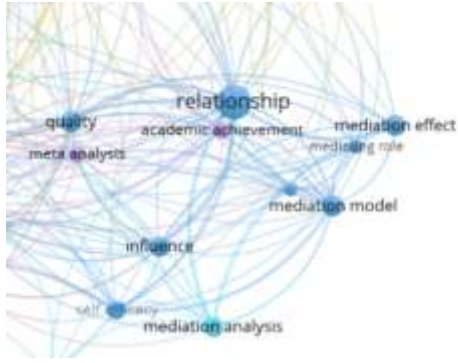

Fig. 5. Visualization of keyword cluster 3

The network division obtained in cluster 4 contains six elements namely Creativity, framework, innovation, moderated, mediation model, process, relation marked in yellow. (see Figure. 6 & Figure 9). Networking on cluster 4 on science education in conflict resolution in elementary schools emphasizes innovation, creativity, relationships. Network linkages in cluster 2 in science education in resolving conflicts in elementary schools emphasize innovation, creativity, relationships. Human existence while still alive will not be free from conflict. Conflict is a fact that shows that humans live, humans cannot avoid it. Conflict can happen at any time and to anyone [47]. Conflict can involve groups globally, individuals with other people, and/or conflict within oneself. Conflicts that occur in human life are always motivated by differences. Differences that are not understood, which trigger conflict, cannot be managed. If these differences are managed well and wisely, they will become a source of change [48].

The theory of resolution education or peace education boils down to three important things, namely 1) the knowledge based subject approach or a knowledge-based approach. This means that this approach is interpreted as an academic subject like other sciences that can be taught in the school curriculum. 2) the skills and attitudes approach or a skills and attitudes based approach. This means that peace education focuses on the

importance of efforts to build peace through strengthening students' capacity in terms of attitude and tolerance, avoiding conflict, working together and resolving conflict. 3) combining knowledge, skills, and attitudes, an approach that combines knowledge, skills and attitudes. This is an approach that combines the two previous approaches. Conflict resolution education as a subject and also as a set of attitudes and skills that must be possessed by students [49]. If the group provides clear conflict resolution education at school for the formation of three domains. Namely knowledge, skills and skills. These three things have their respective purposes. The three domains and their objectives will be explained below a. Knowledge objectives, related to self-awareness and self-understanding, understanding of conflict, ability to identify causes of conflict through resolution, analyzing conflict, increasing understanding by fostering peace and resolving conflict, mediation process, understanding the meaning of individual and group freedom, awareness of cultural heritage , and recognize negative attitudes. b. Skills aimed at active communication, being assertive, working together, the ability to affirm, think critically, be able to understand a stereotype, manage emotions, solve problems, construct solutions to conflict, avoid conflict, participate in society for peaceful efforts, and the ability to live in change. c. Attitudes aim to be tolerant, accept others, respect differences, empathy, solidarity, social responsibility, have a sense of justice and equality, the ability to enjoy life, and gender equality.

Conflict resolution programs in schools have various terms, for example Conflict Resolution Education, Peace Education, Peacemaking, Violence Prevention, or Violence Reduction [50]. however, it has the same goal, namely trying to create opportunities for students and other members of the school community to: recognize that conflict is a natural part of life and can be resolved peacefully. Responding and being aware of conflict and diversity in responding to events. Learning the principles and skills of conflict resolution, taking responsibility individually and collectively in resolving conflicts. The innovation is in the form of a conflict resolution education program in the elementary school curriculum, both in teacher education institutions and in the education of prospective teachers [51].

The mapping visualization analyzed in this study on cluster 4, (see Figure. 6)

Fig. 6. Visualization of keyword cluster 4

The network division obtained in cluster 5 contains 6 items namely Academic, achievement, child, effectiveness, meta-analysis, web marked with purple (see Figure. 7 & Figure 9). Networking on cluster 5 on science education in conflict resolution in primary school emphasizes on children acquiring learning and education in school. Children are important subjects or parties involved in problems that occur in the world of education such as conflict. Conflict is something natural. Conflict will always be there, because basically we will always communicate and interact with others. So are the children. Conflicts can arise because of differences of opinion, values and desires. Conflict can also occur when a child feels that someone else is interfering with the activities he is doing. When these conditions occur, the child will experience negative feelings such as anger, irritation, anxiety, frustration or even envy [52]. When conflict is not managed properly, it can trigger a negative impact on the child's psychological state and relationships with others. But don't worry, conflict can also be a positive thing when a child can handle and manage it. Every kid is unique. Parents need to understand

the differences between each child and treat the child differently according to their age, character and abilities so that the child feels treated specifically and individually [53-54]. Nevertheless, keep giving attention, affection and responsiveness with a balanced portion for each child. Appreciating the efforts of every child in resolving their conflict is a good thing to do. We need to know, when parents are already trying to help and resolve conflicts between children, maybe conflicts will remain. It's because, conflict is the result of a social interaction. However, by having good communication skills, trust me, the child will learn how to solve problems effectively, accurately and not to create new problems [55].

The importance of conflict resolution educators in schools, stating that school is the center of student social life. Ethnic, gender, age, luxury and poverty, skills are fertile ground for conflict and opportunities for growth. So schools must change the basic way of educating students so that they don't fight each other but develop the ability to resolve conflict constructively. The reasons for having a conflict resolution education in schools are: 1) being oriented; 2) being able to understand that each individual is different and capable of seeing situations or empathy and delaying to blame others; 3) being capable of managing various emotions; 4) being capable to communicate well; 5) being creative, in solving problems; and 6) being able of critical thinking in predicting and analyzing conflict situations [56-58].

The mapping visualization analyzed in this study on cluster 5, (see Figure. 7)

Fig. 7. Visualization of keyword cluster 5

The final network division obtained in cluster 6 contained 5 items, namely country, depression, grade, mathematics, mediation analysis marked with turquoise color (see Figure 7 & Figure 9). The network linkages in cluster 5 in science education in resolving conflicts in elementary schools emphasize the focus of content in science education, namely mathematics subjects which are often the source of conflict felt by elementary school children. The ranking of a country can be seen from the PISA results, namely countries that have advantages in education have high rankings in literacy and numeracy. Mathematics is one of the material content subjects that is always involved in conflict. This becomes a factor in children's depression if they do not gain superiority in rankings. Depression is one of the results of conflict that begins in the child's mind. Depression is often associated with a decrease in mood (feelings), but the decrease in mood that occurs from day to day only causes slight variations [59].

Depression is a common thing in adolescents but is often ignored, whereas in the adult phase there are always symptoms of depression. received special attention. This is because the symptoms of depression in adolescents are considered to be: excessive sensitivity of feelings, changing moods, and the emergence of depressive symptoms is fluctuating [60-62]. Mathematics is a basic science for developing students' abilities. Mathematics learning is a process designed with the aim of creating an environmental atmosphere that allows students to carry out mathematics learning activities [62]. Explains that if a child is studying mathematics then the child is essentially honing his intelligence directly. This is because a person's level of intelligence is closely related to the ability to think, reason and imagine. Through the implementation of an effective, efficient and interesting mathematics learning process can be carried out and the results of the learning will be achieved by each teacher.

Providing rewards and punishments is a teacher innovation so that students are more active in the learning process and usually get good final results, which is a form of conflict resolution in science education which focuses on mathematics learning. Rewards are anything that teachers give to students because they have behaved in accordance with what is desired, namely participating in learning well and getting good results and can be a driving force or motivation for learning for students, so that they can behave well in the mathematics learning process [63-65]. Punishment is an action given by educators to students who have made mistakes, with the aim that students will not repeat it again and will correct the mistakes they have made. A punishment is appropriate to be given to students if the suffering caused has positive and pedagogical value [66-67]. So, the network linkages in cluster 6 focus on science education in resolving conflicts in elementary schools on depression levels and children's achievement grades, especially in scientific learning content.

The mapping visualization analyzed in this study on cluster 6, (see Figure. 8)

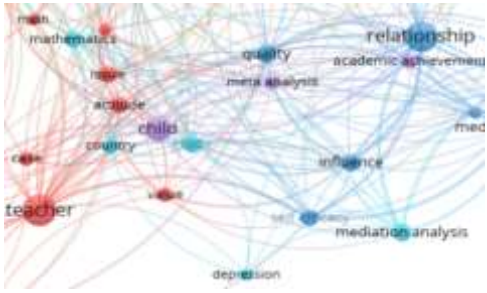

Fig. 8. Visualization of keyword cluster 6

Based on the network on the cluster in the bag, can be clearly seen the combination of the network-networks thoroughly. Visualization of the analyzed mapping in this research consists of 3 parts; network visualization (see Figure 3), overlay visualization (Figure 4), and density visualization (Figure 5).

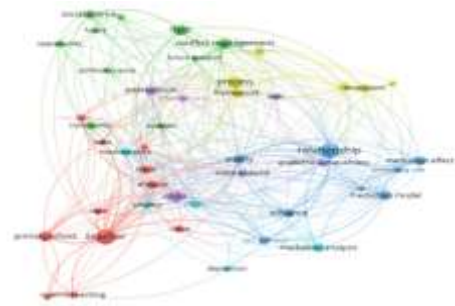

Fig. 9. Visualization of keyword ketwork on science education in primary schools' conflict resolution

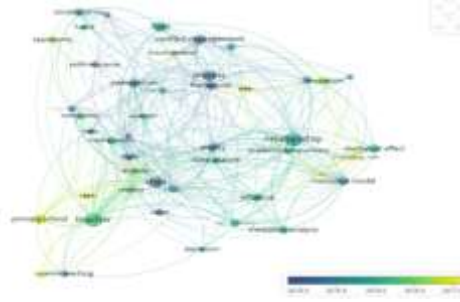

Fig. 10. Visualization of Keyword Overlay on science education in primary schools' conflict resolution

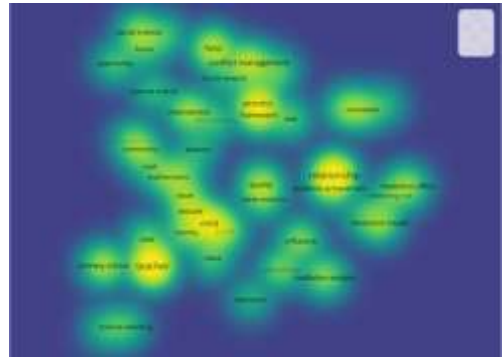

Fig. 11. Visualization of keyword density on science education in primary schools' conflict resolution

The link between a term with other terms is shown in every cluster. A label was given for every term with a colored circle. The size of the circle on every term depends on the emergence frequency of the term [68]. The size of the label circle shows a positive correlation with terms within titles and abstracts [69]. The more often the terms are found, the bigger the size of the label [70].

The relation between terms is depicted as a network that is interconnected to each other. Figure 3 shows clusters of every term that is often studied and related to the research topic. From the clusters displayed in the network visualization, it can be seen that studies on science education in primary schools' conflict resolution could be divided into 3 field study areas. The first one is conflict management classified as cluster 2 with 20 total links and a total link strength of 33 (see Figure. 12). The second term is science which is classified as cluster 1 with 7 total links and 11 total link strengths (see Figure. 13). The last one is the primary school term classified as cluster 1 with 15 total links and 31 total link power (see Figure. 14).

Based on data network Visualization on science education in primary schools' conflict resolution, (see Figure. 9-10), could be divided into 3 field study areas. The division into 3 network areas, area 1 namely showing network relationships in each conflict management term such as social science, field, future research, process, framework, web, innovation, intervention, political science, effectiveness, attitude, quality, relationship, mediation analysis, value, and teacher (see Figure 12). area 1 namely showing network relationships in each science term such as teacher, primary school, value, self-efficacy, attitude, and argument (see Figure 13). The last field study area shows network relationships in each primary school term such as teacher, science teaching, self-efficacy, child, case, attitude, meta-analysis, quality, process, math, community, and opportunity (see Figure 14).

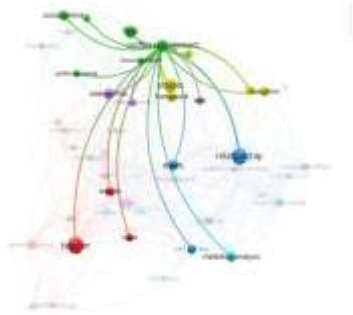

Fig. 12. Network visualization of conflict management term keyword.

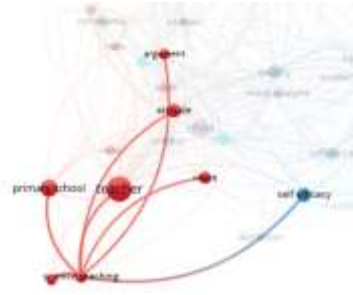

Fig. 13. Network visualization of science term keyword.

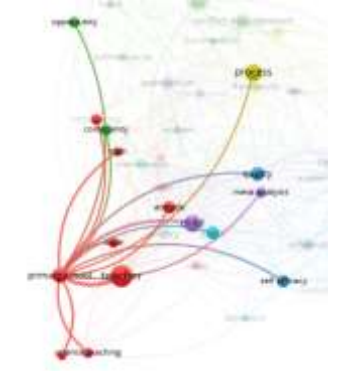

Fig. 14. Network visualization of primary school term keyword

Based on the three network areas above (see Figure 12-14), the findings of the study on science education in resolving conflicts in

elementary schools are Science education as an important component in a learning, Science is a scientific discipline from physical science and life science. The physical science group includes: astronomy, chemistry, geology, mineralogy, meteorology and physics. The life science group is biology (anatomy, physiology, zoology) [71]. Defines science from the aspects of ontology and epistemology, namely a series of concepts and experimentation and observation schemes, and is useful for further observation and experimentation.

Science seeks to arouse human interest and curiosity so that their intelligence and understanding of nature continues to develop. Accompanied by the flow of information, the reach of science broadened and applied science, namely technology, was born. The science and technology achieved by a nation is usually used as a benchmark for a nation's progress. The progress of this nation is largely determined by the ability of Indonesia's human resources in mastering science and technology. Science taught according to its essence, namely as a process, product, attitude and technology will become a means to develop cognitive, affective aspects and science process skills through a series of learning at school [72].

Science is knowledge that can be accepted by the general public as a product of science (scientific product) whose discovery occurs through a series of long, structured investigations (scientific process), whose success in carrying out this investigation is determined by the scientific attitude one has. Science as a scientific product is a collection of knowledge consisting of: facts, concepts, postulates, principles, laws, theories and models. Science as a process is a collection of hands-on activities, experiments, and projects aimed at investigating the wonders of the world. These process skills can include: the ability to observe, collect data, process data, interpret data, conclude, and communicate. Science as an attitude is a human activity characterized by thought processes that take place in the minds of people involved in that field. During the investigation process (scientific process) to produce scientific products, it is hoped that an open, objective, reality-oriented, responsible, hard-working, honest, thorough and so on attitude will develop. Science lessons in elementary schools are a learning program that aims to develop and prepare students so that students are ready and responsive in facing their environment. Students can be responsive in dealing with their environment by developing process skills and scientific attitudes. The aims of teaching science in schools can be very diverse, including science as a product, science as a process, science to develop attitudes, and science to develop personal and social skills [73].

In relation to science learning at school, there is a goal, namely providing science material for school level The basis is that students can understand the concept of science which can then be linked together contextual in everyday life. Besides Therefore, students can develop a sense of gratitude towards God Almighty over all His greatness. This is part of resolving conflicts that occur. School is the center of students' social life. Differences in ethnicity, gender, age, luxury and poverty, skills become fertile ground for conflict and opportunities for growth. So schools must change the basic way of educating students so that they do not fight each other but develop the ability to resolve conflict constructively [74]. Conflicts between individuals among students occur very often. Conflicts between individuals in elementary school students have the potential to cause reactions that cause violence such as teasing and fighting. Conflicts like this will ultimately damage existing friendships and disrupt students' concentration on lessons. Inter-individual conflict is a conflict that occurs between a person and one or more people. This conflict is sometimes substantive, namely involving ideas, opinions, interests, or emotional, involving differences in tastes, and feelings of likes or dislikes.

So the role of teachers is very important in overcoming conflicts that occur, such as focusing on Conflict resolution is a way for

individuals to resolve problems that are being faced with other individuals voluntarily. The conflict resolution skills that must be implemented are: 1) able to be oriented; 2) able to understand that each individual is different and able to see the situation or empathize and postpone blaming others; 3) able to manage various emotions; 4) able to communicate well; 5) able to think creatively, in solving problems; and 6) able to think critically in predicting and analyzing conflict situations. Approaches that can be used in conflict resolution education are: 1) Process curriculum approach, 2) Mediation program approach, 3) Peaceable classroom approach and 4) Peaceable school approach [75]. Apart from this approach, there are several types of approaches that are commonly used in conflict resolution education programs in schools, namely: the Cadre Approach and the Comprehensive Approach. However, in resolving conflicts all parties must play a role, namely the family, school, community and government.

The result overlay Visualization shows the novelty of related research. Figure 1 and Figure 9 show that research about science education in primary schools' conflict resolution was mostly done in 2013. The popularity period of conflict resolution term is quite long. Therefore, it is still possible to conduct new research on conflict resolution education in primary schools.

Fig. 15. Overlay visualization of science education in primary schools' conflict resolution keyword

Referring to the mapping analysis of the article data, keywords of science education in primary schools' conflict resolution are still rarely used in the research. Based on the result of this study, research on this topic can be done with innovations and updated research based on the related topic.

Conclusions

The purpose of this study was to analyze computational mapping on the bibliometric data of research articles. The publication theme taken for this study was “Science Education in Primary Schools' Conflict Resolution”. The articles used in this research were taken from the Google Scholar database through Publish or Perish software. References used in this study include the title and abstract. Based on the result of this study, 992 relevant articles were published from 2013 until 2023. The result of this study found that can be divided into three areas, Conflict Resolution, Science Education, and Primary School terms. The research results show that research has decreased significantly in the last 5 years, namely from 2013 to 2019 with a total of 205 articles down to 54 articles. From 2019 to 2022 there will be static for the publication of articles on this topic. A drastic decline has occurred in the last 2 years, namely from 2021 to 2022, with a total of 9. The latest data in 2023 saw an increase of 1 article to 10 published articles. So that it can be said that it was decreasing. Therefore, it can be said that it is decreasing. The result of this study showed that conducting research on Science Education in Primary Schools' Conflict Resolution is still highly possible and related to other terms.

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