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Students' Mathematical Connections Through a Learning Community Approach: A Systematic Literature Review

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ABSTRACT

This research examines the relationship between mathematical connections and learning communities, identifies the most suitable form of learning to enhance mathematical connections through a learning community approach, and develops strategies for assessing mathematical connection abilities to inform mathematics teachers and lecturers. The study focuses on teaching mathematical connection skills using a learning community approach at various educational levels. The dimensions analyzed include mathematical connections based on period, education level, and school mathematics topics used in learning activities. The research method employed is a Systematic Literature Review (SLR), which includes identifying, analyzing, and interpreting existing research. The overall analysis results obtained are (1) distribution of data on searches for mathematical connection skills, learning community mathematics teaching skills, and mathematical connections through the learning community approach, based on year of publication, level of education, and mathematics topics used; (2) the impact of the learning community on the capacity to make mathematical connections; and (3) learning methods to improve mathematical connections through a learning community approach. This literature review suggests that teachers can optimize the development of mathematical connections in student learning by helping students understand the questions posed in each problem.

Keywords: Mathematical connections; Learning communities; Systematic literature.

INTRODUCTION

Mathematics is a subject taught at all educational levels, from elementary to university (Brahier, 2020), and it plays a crucial role in our daily lives (Hasibuan et al., 2018). Mathematics cannot be separated from other scientific disciplines and everyday problems because all the materials are related. National Council of Teachers of Mathematics (NCTM) (2000) states that students must have five primary abilities when learning mathematics at school: problem-solving, communication, connection, reasoning, and representation. Middle school students need to develop the ability to make mathematical connections.

Mathematical connections refer to the ability to link mathematical concepts within mathematics and other fields, including connections between mathematical topics, connections with other disciplines, and connections with everyday life. Students need mathematical connections because mathematics is a unity, where one concept is related to others. Students are expected to recognize and use relationships between mathematical ideas, understand how mathematical concepts are interconnected and underlie each other to produce a unified whole, and identify and apply mathematics outside the mathematical context (NCTM, 2000). In this way, students can understand that mathematics is a broad science, meaning that it has applications in other fields as well as in other fields and everyday life (Bernard, 2015). Apipah & Kartono (2017) state that indicators of mathematical connection abilities are as follows: (1) identifying and comprehending the relationships among various representations of mathematical concepts and procedures, (2) understanding the connections between different mathematical topics, (3) applying mathematics in other disciplines or real-world situations, (4) recognizing equivalent representations of the same concept or procedure, (5) identifying connections

between one procedure and another in equivalent representations, and (6) use existing connections between one procedure and another procedures.

As a supporting science, mathematics is widely used to build other fields of study and solve everyday problems. Every child has mathematical connection abilities, but the levels vary (Casey & Ganley, 2021). Rahmanti et al. (2018) state that students need excellent math connections. Students need help wrangling concepts they know. We see this because they take a long time to understand the questions or problems after reading them. Thus, Radiusman (2020) states that the ability to study mathematics is essential for students, particularly in solving problems that need to understand the relationships between mathematical concepts, other disciplines, or real-world situations. The relationship between concepts or principles in mathematics is essential in considering mathematics learning (Andriani et al., 2020). Students gain a deeper and more comprehensive understanding of mathematics with this knowledge. Students also only need to memorize less. Therefore, learning mathematics becomes easier (Sidneva, 2020). Through mathematical connections, when students are built upon familiar foundations, they can strengthen their grasp of prior knowledge and more readily comprehend new concepts. Mathematics is also essential in education because it helps develop human thinking power.

Previous studies indicate that students struggle with making mathematical connections, so improvement is needed. The fact that students still have difficulty completing mathematical connections shows that mathematical connection abilities are essential to develop at all levels of school problems, especially in middle school. One way to improve students' abilities is to form an integrated learning community. This community can be a place to build good relationships between students. A learning community is a group of people who engage in activities to share knowledge and understanding, then talk and think critically about these activities to improve their quality by predetermined goals (Rini, 2021). Learning communities aim to create a learning process involving learning and learning relationships between teachers and students using students (Mantu et al., 2020). Other research shows that learning communities are an excellent learning model for improving student learning activities (Burhan, 2017).

This research focuses on determining how practical the learning community approach is on students' mathematical connection abilities. This research reviews the literature on connection mathematical skills, focusing on relevant articles published in academic journals in mathematics. This research aims to provide an overview of the relationship between mathematical connections and learning communities, the most suitable form of learning to enhance mathematical connections through a learning community approach, and the methods that can be used to assess mathematical connection abilities so that stakeholders like mathematics educators receive clear and detailed information on teaching mathematical connection skills through a learning community approach at different educational levels. By considering the period, education level, and mathematics materials taught in schools, this research dimension analyzes the mathematical connection capabilities of the learning community.

RESEARCH METHODS

This research employed a Systematic Literature Review (SLR) methodology, which entails identifying, evaluating, and interpreting research published in national and international journals (Anditiasari et al., 2021; Reksadini et al., 2021). The stages applied to conduct a systematic literature review are 1) developing research questions, 2) identifying research articles, 3) evaluating the feasibility of research articles, 4) summarizing research articles, and 5) interpreting findings in research articles (Putra & Andriani, 2021; Siregar et al., 2020). This study used the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) method, which offers a clear and systematic research protocol approach, to obtain comprehensive research results (Stovold et al., 2014).

The researchers gathered preliminary data by analyzing the findings of previous studies. This secondary data comes from primary reports published in online scientific articles or journals. The research samples consist of national and international articles on the research topics published in the past ten years.

Selection Criteria

The inclusion and exclusion criteria were set based on the Systematic Literature Review protocol, as shown in Table 1. We conducted a screening process and limited it to items published between 2014 and 2024, keeping in mind the concept of maturity of the research field by (Kraus et al., 2022). The focus of this research is articles that have been published in journals or conference proceedings. The quality of their publications—especially in education—is the primary reason this data was selected. All articles used were taken from Google Scholar, Scopus, and ERIC, and the keywords were mathematical connection ability and learning community. The methodological approach used to answer this literature study question is explained in Figure 1. Twenty-one publications were selected for additional analysis based on the literature review results and the inclusion and exclusion process.

Table 1. Eligibility criteria for exclusion

Criteria	Eligibility	Exclusion
Types of literature	Research publications, such as journal articles or conference proceedings	Books, book series, chapter collections, or systematic review articles
Language	English or Indonesian	Non-English or non-Indonesian
Timeline	Between 2014 – 2024	Before 2014

Data Analysis

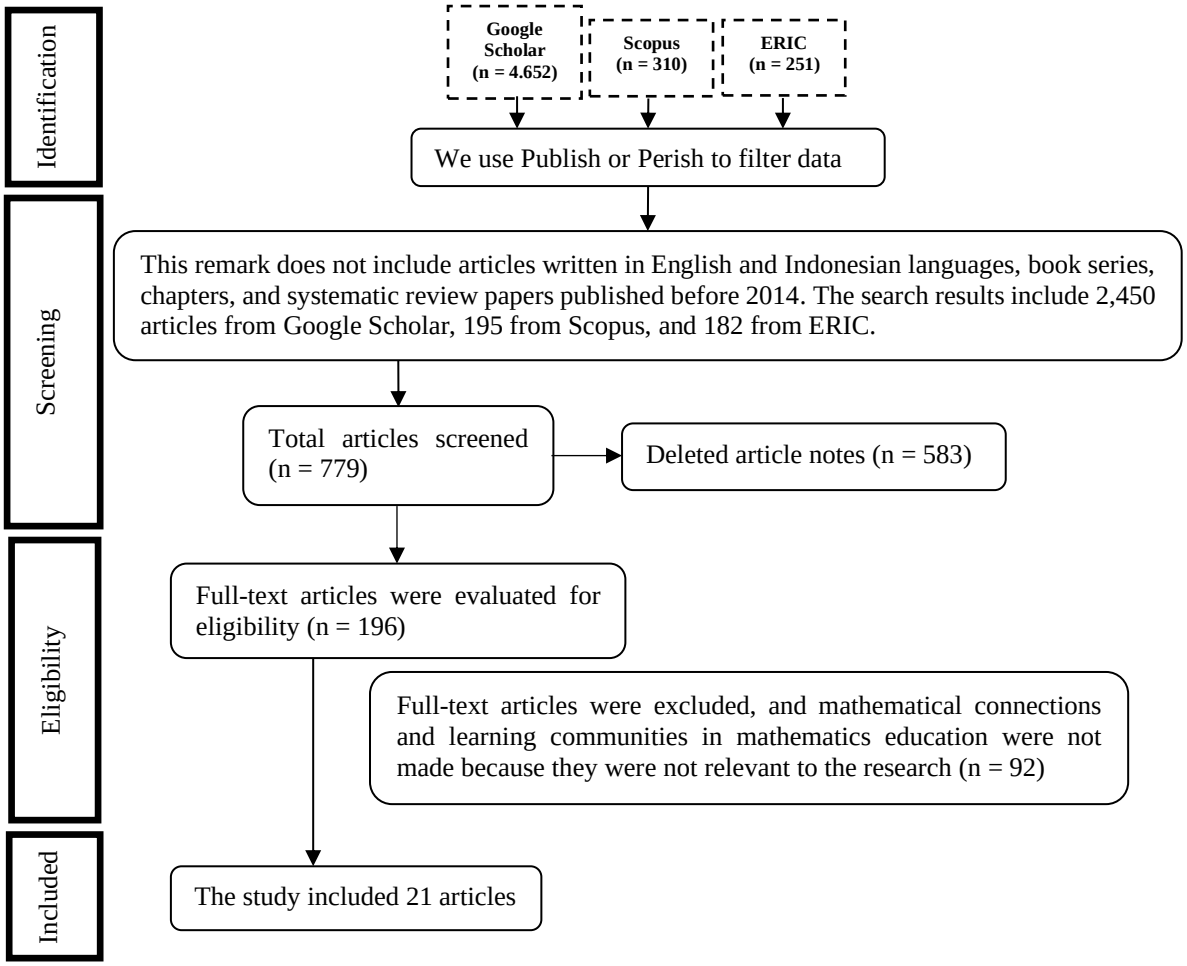

Figure 1. Filtering process flow

Content analysis was employed to examine the gathered data. Preliminary searches turned up 5,213 articles in 24 subdisciplines. We used Mathematics Education as one subdiscipline to filter the

data once again. Data and information about Mathematical Connections and Learning Communities were synthesized to conduct the study based on the period's dimensions, educational level, and the mathematical learning topics used in schools.

RESULTS AND DISCUSSION

Result

The author extracted the points or keywords that the researchers used to communicate their thoughts from the findings of the manual synthesis of a subset of primary research. When an individual conducted a study but it was published in a different year, the author re-synthesized it by examining the commonalities. If there are commonalities, the most representative one is selected; if the topic and substance are different, the topic is however utilized for this study. 21 studies were gathered and combined for this study, including research from Asfar et al. (2022); Baiduri et al. (2020); Cavanagh & McMaster (2017); Diana et al. (2020); García-García & Dolores-Flores (2021); Haji et al. (2017); Hoon et al. (2021); Ilmi & Tsani (2023); Khairunnisak et al. (2020); Kiswanto Kenedi et al. (2019); Menanti et al. (2018); Needs et al. (2022); Priharvian et al. (2023); Rahmadeni et al. (2020); Rahmani & Widyasari (2018); Rodríguez-Nieto et al. (2022); Son (2022); Supriadi (2015); Tohir et al. (2020); Zainal et al. (2024); Zunarni et al. (2022).

Research on mathematical connection abilities by year of publication

Research on mathematical connecting abilities started to appear in publications in 2015. The line diagram in Figure 2 shows the distribution of the number of mathematical connection studies throughout the preceding ten years. Figure 2 shows that in 2014, there needed to be more research regarding efforts to develop and improve abilities in mathematical connections. Even so, from 2015 to 2023, researchers' interest in mathematical connections began to increase, and every year it always increases.

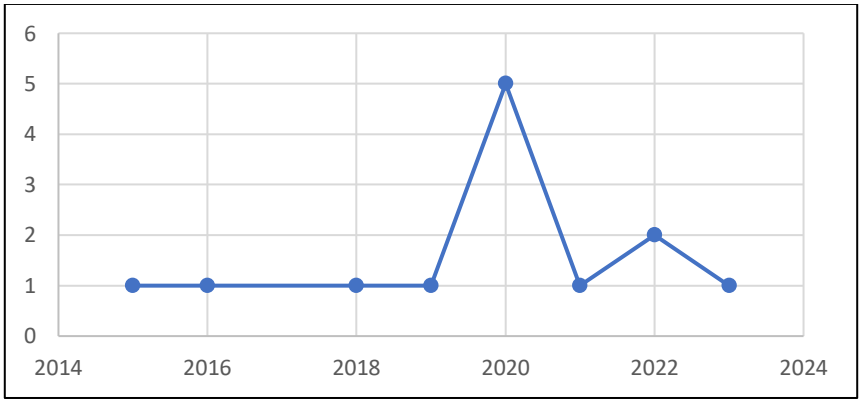

Figure 2. The distribution of the annual publication amount

In 2019–2020 and 2021–2022, there were more research studies on mathematical connections; in 2020–2021 and 2022–2023, there were less. There were 38.5% more studies on mathematical connection abilities in 2019–2020, which is a considerable increase. In 2020, the most research was carried out.

Research on mathematical connection abilities based on education level

The literature review indicates that investigations on mathematical connections are carried out across all educational levels, including elementary, middle, high school, and university. Figure 3 shows the percentage of each study on mathematical connections at each level derived from synthesizing the articles analyzed for this research.

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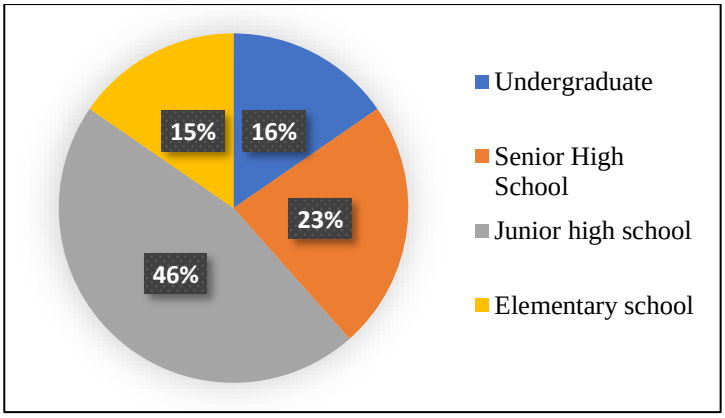

Figure 3. Percentage of mathematical connection research based on education level

According to Figure 3, junior high school research on mathematical relationships accounts for 46% of all studies performed. Meanwhile, the lowest rate was research conducted in elementary schools, namely 15% or two studies.

Research mathematical connection abilities based on mathematics topics

The mathematical topics used to teach connection mathematical skills were identified based on the findings of data synthesis in this study; the specifics of the material are outlined in Figure 4 below. The five standards for mathematics material taught in the classroom are as follows: numbers & operations, algebra, geometry, measurement, and data analysis & probability (NCTM, 2000). In this instance, the synthesized data is presented in a more focused manner. Geometry is the mathematical content most widely used to teach mathematical connection skills, namely research conducted by Cavanagh & McMaster (2017); Diana et al. (2020); Ilmi & Tsani (2023); Kiswanto Kenedi et al. (2019); Rodríguez-Nieto et al. (2022); Son (2022); Zainal et al. (2024). In addition, linear equations, calculus, and integer operations are the three most widely used mathematics contents in learning mathematical connection skills. However, some studies do not write down the mathematical material used.

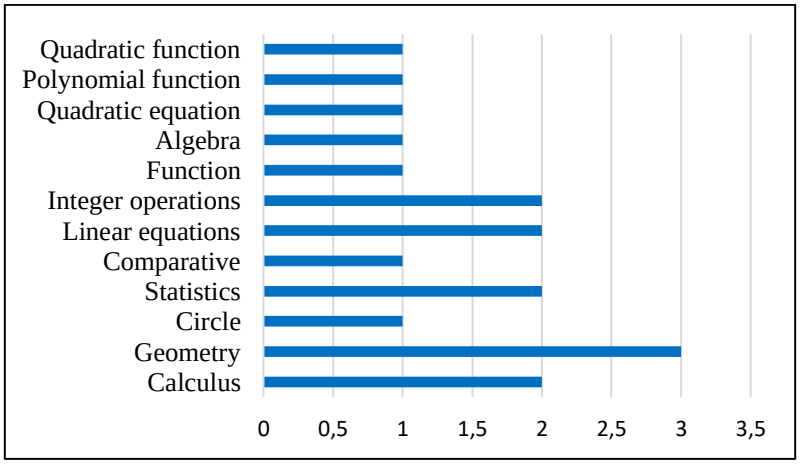

Figure 4. The number of mathematical topics in mathematical connection research

Learning community research in mathematics learning by year of publication

Research on learning communities in mathematics learning has been published during the past 10 years, starting in 2017. The distribution of research on learning communities in mathematics learning over the past decade can be seen in the line graph in Figure 5. Figure 5 indicates that by 2016 there was no research regarding coaching and experimental efforts in implementing learning activities through learning communities. Even so, from 2017 to 2024, The interest of scholars in learning communities for mathematics education started to grow, and each year there is constant.

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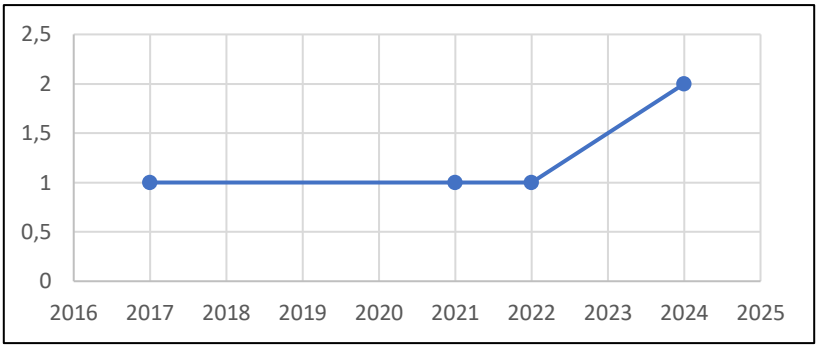

Figure 5. The distribution of the annual publication amount

In 2022-2024, there were 40% more learning community research projects in mathematics than in the previous year. The most research was conducted in 2024.

Learning community research in mathematics learning based on education level

Based on a literature review, research on learning communities in mathematics learning has only been conducted at the elementary and junior high school levels. Figure 6 shows the percentage of each study of learning communities in mathematics learning at each level determined by synthesizing the reviewed publications.

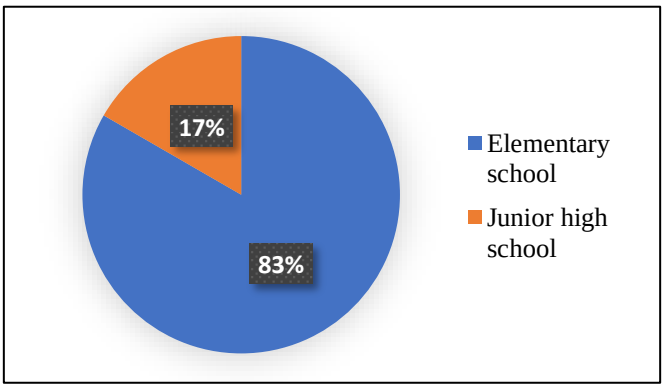

Figure 6. Percentage of learning community research in mathematics learning based on education level

Figure 6 demonstrates that, out of 5 studies, 83% of the research on learning communities in mathematics instruction has been conducted at the elementary school level. Meanwhile, the lowest rate was research conducted in junior high schools, namely 17% or 1 study.

Learning community research in mathematics learning based on mathematics topics

Considering the findings of the data synthesis in this study, the mathematics topics employed in the research on learning communities in mathematics learning were recognized, and the content specifics are elaborated in Figure 7 below. School mathematics consists of a variety of topics taught. One of the school mathematics standards is the content standard, which includes material such as algebra, measurement, geometry, data analysis, and probability (Hutauruk & Panjaitan, 2020). Nevertheless, there is a more focused presentation of the combined data. The most popular math subject to teach using a community learning method has to be arithmetic, as done by (Cavanagh & McMaster, 2017; Zainal et al., 2024). In addition, fractions com, parisons, and algebra are the two mathematics contents most widely used in mathematics learning through a learning community approach.

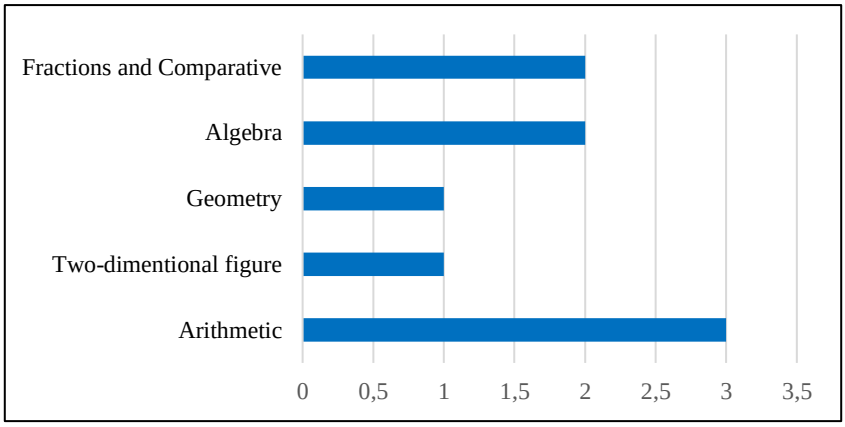

Figure 7. Number of mathematics topics in learning community research in mathematics learning

Research on mathematical connection abilities and learning communities by year of publication

In 2018, studies on mathematical connection capabilities through a learning community moved closer to the beginning of the appearance. These studies span the last ten years. Figure 8 shows a line diagram that shows the distribution of mathematical connection research using a learning community approach over the previous ten years. Figure 8 shows that in 2017, there is a need for more research regarding efforts to develop and improve mathematical connection abilities through a learning community approach. However, in 2018, 2020, and 2023, research interest in mathematical connections through a learning community approach began.

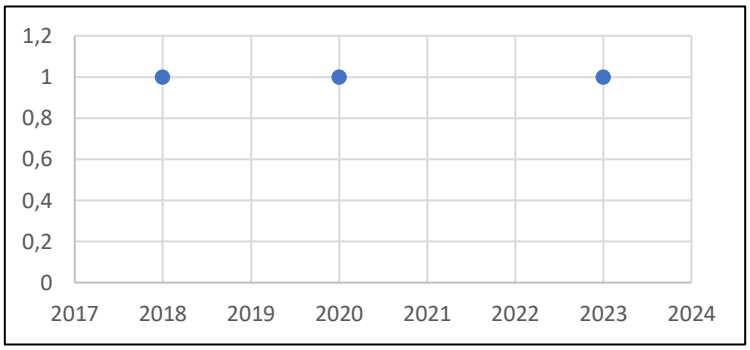

Figure 8. The distribution of the annual publication amount

Figure 8 shows that there is not much research on mathematical connections through a learning community approach; every year, there is only one research, and not, there is.

Research on mathematical connection abilities and learning communities based on educational level

Based on a literature review, research on mathematical connections through a learning community approach was carried out at several levels, namely middle school and high school. Combining the publications this study analyzed yielded the percentage of each research on mathematical connections made possible by learning communities at every stage, as depicted in Figure 9.

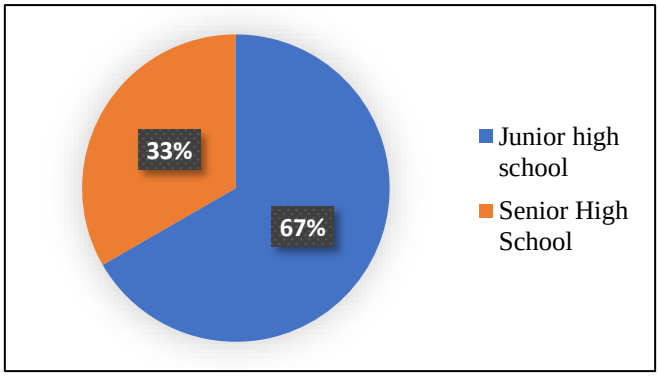

Figure 9. Percentage of research on mathematical connections through a learning community approach based on education level

Figure 9 demonstrates that junior high school students accounted for 67% of the two studies that completed the largest percentage of research connections on mathematics through learning communities. High schools, however, with 33% or 1 study, had the lowest percentage.

Research mathematical connection abilities and learning communities based on mathematics topics

Considering the findings of the data synthesis in this study, the mathematical topics used in learning mathematical connection skills through learning communities were obtained; the content details are explained in Figure 10 below. Each research on mathematical connections through a learning community approach uses a different mathematical topic. With only three studies, to support learning, only three different math topics were used: comparison, statistics, and arithmetic and geometric sequences. These studies were conducted respectively by Ilmi & Tsani (2023); Rahmani & Widyasari (2018); Tohir et al. (2020).

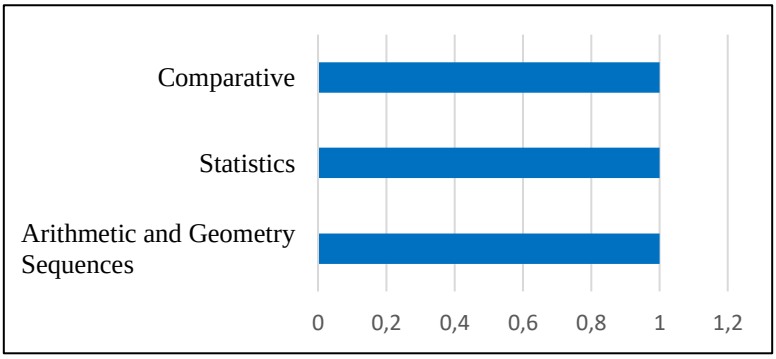

Figure 10. The number of mathematical topics in research on mathematical connections through a learning community approach

Discussion

The results of this analysis indicate that over the past ten years, there has been an increase and decrease in the number of studies looking at the effectiveness of learning communities and mathematical connections in mathematics learning. The most significant research on mathematical connections occurred in 2019-2020, but the largest research occurred in 2020. Meanwhile, the most relevant research on learning communities in mathematics learning occurs in 2022-2024, but the largest research occurred in 2024. The increase in publications due to research focusing on students' mathematical connection abilities and learning communities in mathematics learning is slowly but surely starting to be noticed. This is consistent with the results of Rodríguez-Nieto et al. (2022) who found that in the late 1990s and early 2000s, interest in and funding for studies on mathematical

connection abilities started to grow. Research on learning communities in mathematics learning started to become popular and increased, especially since the mid to late 1990s, one of which was marked by the emergence of social constructivism theory (Voskoglou, 2019). Although we found different things in our research in 2014 and 2016, research on the ability of mathematical connections and learning communities in mathematics learning that was explicitly carried out did not see publication. It can be seen that the number of studies on mathematical connection abilities has decreased, and the reasons need to be analyzed further. Several possibilities cause a decrease in the number of publications. For example, researchers still need to learn how to convey the idea of mathematical connections, are not yet familiar with mathematical connections themselves, or have researched it but have not yet published it.

Meanwhile, there have only been three studies of mathematical connection abilities through a learning community approach over the last ten years. There is not much research on mathematical connections through a learning community approach, and there is only one research every year and not every year. Research on learning communities often uses in-depth qualitative methods, such as case studies or ethnographic research. Meanwhile, measuring mathematical connection abilities usually requires more precise quantitative approaches and is frequently more challenging to integrate with the methodological frameworks used in learning community research (Achjar et al., 2023).

In general, if you look at the number of research publications that tend to fluctuate, the causal factors can be provided by either internal research or by an external researcher. More specifically, the availability of facilities and resources, such as digital platforms that support learning communities and mathematics learning aids to make it engaging, the necessity for research to address a specific problem or challenge, and the availability of funding and support for research are external factors that may account for the high and low number of studies on mathematical connections and learning communities in mathematics learning. Teachers felt stigmatized and could not overcome the challenges the researchers experienced since they affected the learning process. According to Kadariah et al. (2020), a lack of facilities and infrastructure is one of the reasons teachers experience learning difficulties. However, of course, other components come from the researchers themselves. These include the subject's perceived importance, relevance, motivation, curiosity, and individual requirements.

In elementary schools and universities, a researcher who also works as a student, teacher, or lecturer can use learning communities to explain mathematical connections. Every youngster benefits from mathematical connection abilities at every cognitive level. According to Piaget's theory, the level of cognitive development of primary school students is in the concrete operational stage, or between the ages of 7 and 11 (Wardani, 2022). Children learn to think logistically, classify and understand concrete concepts, pursue goals, and understand conservation concepts at this stage. Children 12 years and older are at the formal operational stage for junior high school to university education. At this point, kids can apply deductive reasoning and think abstractly about hypothetical scenarios. This means that whatever the level of education at which mathematical relationship concepts are taught, cognitive development, including thinking and reasoning skills, will progress with age. Whatever students learn will impact their actual abilities and help them undergo further progress at a higher level.

The study notes that most of this research has been conducted in junior high schools. Part of that is because middle school students are developing their ability to be rational thinkers and understand abstract concepts at a very young age critical time in their cognitive development. In addition, middle school marks the transition from childhood to adolescence for many students, which may increase the relevance of studies on them. Research on mathematical connections associated with learning communities has been conducted more in secondary schools. Furthermore, research on learning communities in mathematics is mostly done in elementary schools. This is because, at the elementary level, schools are significant in forming a solid foundation of mathematical understanding, and approaches to mathematics learning are often more oriented towards understanding concepts than applying mathematical algorithms or techniques. On the other hand, the elementary school level is a school that is rarely used as a place for research on mathematical connections. According to Efendi & Gustriani (2020), several reasons prevent teachers from conducting research in elementary schools, including their busy schedules with many teaching hours and additional responsibilities such as extracurricular activities or administrative tasks. This time limitation makes it difficult for them to get sufficient time to conduct extensive and in-depth research.

In learning mathematical connections, teachers can use various mathematical topics in the mathematics education curriculum. However, this does not mean other mathematical topics are unsuitable for building mathematical connections. Based on Figure 4, geometry is the most often taught topic. Geometry is a mathematics topic taught at the elementary school and university levels. Fatimah et al. (2023) state that learning mathematics with topics is relevant in building students' mathematical connections. This is because learning geometry often involves solving complex problems and requires critical thinking. Students learn to identify relevant information, develop strategies, and apply mathematical concepts to find solutions.

In contrast to mathematical connections, research on learning communities in mathematics learning uses more arithmetic topics. The topic of arithmetic itself includes various basic concepts that are the foundation for further understanding mathematics. In line with this, Laswadi (2023) has discovered that mathematics is essential to study because it is the foundation for learning higher-level mathematics such as algebra, geometry, and calculus. A strong understanding of arithmetic concepts allows students to more easily understand and apply mathematics in a variety of contexts, both academic and everyday life. Meanwhile, in learning mathematical connections through a learning community approach, the mathematical topics used vary in comparisons, statistics, and arithmetic and geometric sequences. That's because varying topics will help students see how different concepts relate to each other and influence each other. This is important for building strong mathematical connection skills.

Learning mathematical connection skills can start by giving a problem. Instructionally-focused mathematical connections (Rodríguez-Nieto et al., 2022). This means that a person understands a concept from two or more previous concepts and then associates their knowledge of the newly acquired concept. Mathematical concepts or procedures that are connected are considered prerequisites or abilities that students must master before the development of new concepts. However, understanding and connecting various concepts that have been and are being studied can be challenging for many students. Several strategies can help students understand and connect mathematical concepts, one of which is forming a study group or what is usually called a learning community where students can discuss and share their understanding of mathematical concepts, which can help strengthen their knowledge. Group discussions allow students to hear different perspectives and problem-solving methods. Using a learning community approach, students will independently carry out learning activities and communicate multidirectional with other students so that the learning becomes student-centered and attracts more student interest. This is in line with the results of research by Ilmi & Tsani (2023), which states that students' mathematical connections, which emphasize student connections in the relationships between mathematical topics, are easier to achieve with the learning community approach model because students know more about the relationships between the mathematical topics being studied.

In addition, implementing mathematics learning through a learning community approach can improve students' mathematical connection abilities compared to traditional teaching methods (Zunarni et al., 2022). This improvement is reflected in various aspects of the teaching and learning process, including the methods used, student involvement, and overall class dynamics (Zainal et al., 2024). Teachers began to apply more innovative and varied teaching methods, moving away from the monotonous expository model. They combine contextual learning and interactive activities, such as games, which help engage students and make learning fun. Implementing well-designed student worksheets is very important in providing challenging tasks that encourage problem-solving and active student participation so that students feel comfortable participating and sharing their thoughts (Cavanagh & McMaster, 2017; Hoon et al., 2021). This approach fosters a more meaningful learning experience (Asfar et al., 2022; Tohir et al., 2020).

Students' mathematical connections that emphasize the relationship between mathematics topics and other subjects can be achieved more easily with a community learning model because students will better understand the relationships between mathematics topics. Students' mathematical connections with other fields will also be easier to achieve and implement because students will better understand the content being communicated and be able to apply it to other fields discussed. One indicator of mathematical connection is that students can connect mathematical topics with other fields, and this connection with other fields still needs to be improved. If students are used to using their mathematical connection skills, then this third indicator will also be practiced more often. Students will find it easier

to solve problems in other subjects if they can communicate with other students in their learning community. With the talk chips model community learning method (Ilmi & Tsani, 2023), students can reflect collectively on the mathematical knowledge they have acquired so that a mutually beneficial learning relationship occurs between students.

The talk chips model and community learning methods effectively improve students' mathematical connection abilities. This is because the community learning approach focuses on the role of friends in small learning groups (Sukarjita, 2020). With this approach, each student will support others in searching and finding information together in a collaborative learning process. Mathematical connectivity needs to be maximized to achieve comprehensive mathematical understanding and influence the development of other skills (Bingölbali & Coskun, 2016). Because creating connections is a way to create awareness, conversely, understanding is considered a connection (Priharvian et al., 2023; Rahmanti et al., 2018). Every mathematics lesson must start with a teacher with a mathematical understanding of interrelated concepts. Mathematics learning must consider the following things (Menanti et al., 2018): (1) teach students to learn on their own; (2) encourage them to be more active in voicing their ideas, speaking, and conveying the results of their work; and (3) teach students to maximize their time in discussions and questions and answers. To have meaning, the mathematics learning provided must also have material related to everyday life (Diana et al., 2020c; Haji et al., 2017; Kiswanto Kenedi et al., 2019).

In other words, students will not only learn mathematics. However, they will also learn about the uses of mathematics through a learning approach that emphasizes the relationship between mathematical concepts and everyday problems (Millaty, 2021). Learning methods that can be used to improve mathematical connections include Problem-Based Learning (PBL), Lesson Study for Learning Community (LSLC), use of interactive electronic teaching materials (BAEI), Contextual Teaching and Learning (CTL), Realistic Mathematics Education (RME), outdoor mathematics learning, and Connecting, Organizing, Reflecting, and Extending with Realistic Mathematics Education (CORE RME) (Haji et al., 2017; Khairunnisak et al., 2020; Menanti et al., 2018; Rahmadeni et al., 2020; Rahmanti et al., 2018; Supriadi, 2015; Tohir et al., 2020). The teacher's ability to make mathematical connections also influences students' mathematical connection abilities apart from the learning methods provided (Baiduri et al., 2020; García-García & Dolores-Flores, 2021). Teachers who pay attention to various relationships when teaching will maximize students' mathematical understanding.

CONCLUSIONS

Mathematical connections are an important skill that students must have. Therefore, teaching and improving mathematics education, including through learning communities, is important. Researchers, educators, and everyone involved in education recognize its importance. Efforts to develop these skills have been carried out over the last ten years at all levels of education, from elementary school to university. Mathematical connection studies increased in 2019-2020 and 2021-2022 but decreased in 2020-2021 and 2022-2023. The most significant increase occurred in 2019-2020, namely 38.5%. The number of learning community research in mathematics learning has increased significantly in 2022-2024, namely by 40%.

Meanwhile, the amount of research on mathematical connections through a learning community approach is small; there is only one research per year, which only sometimes happens. Research on mathematical connections covers all levels of education, while research on learning communities only focuses on elementary and junior high schools. Research on mathematical connections through a learning community approach was carried out in secondary schools. From the mathematics topics, geometry is the topic most widely used to teach mathematical connection skills. Arithmetic is the mathematics topic that is most commonly used to teach mathematics through a learning community approach, and there are only three different mathematics topics used to support research on mathematical connections through a learning community approach, namely comparison, statistics, and arithmetic and geometric sequences. The existence of a learning community greatly influences students' mathematical connection skills because learning communities can improve student learning outcomes in both cognitive, affective, and psychomotor aspects. Appropriate forms of learning to enhance mathematical connections through a learning community approach include providing freedom of opinion during the learning process, providing varied learning experiences, involving all aspects

(cognitive, affective, and psychomotor), integrated and sustainable, related to problems that exist in the real world and guides students to try and solve problems independently. Therefore, the results of this research can be a reference for other researchers who want to study mathematical connections and learning communities.

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