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Integrating SQ3R Strategies to Improve Mathematical Problem-Solving Capabilities in Material Triangles

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Abstract

Indonesian students often struggle with solving math problems, especially when it comes to geometry, like problems involving triangles. One reason for this is that many math lessons don't really involve students in ways that help them understand and work through problems step by step.
9 The SQ3R strategy, which stands for Survey, Question, Read, Recite, and Review, was originally made for improving reading skills, but it could also be useful in math. This study looked at how using
3 SQ3R affects students' ability to solve triangle-related math problems. The research used a quantitative method with a quasi-experimental design, and included two groups: an experimental group and a control group. The students were from a seventh-grade class at SMP Negeri 4 Cimahi, and they were divided into the two groups based on purposeful selection. Data was gathered through problem-solving tests, classroom observations, and other records. The results showed that the group that used SQ3R improved much more in their problem-solving skills compared to the group that didn't use it. The SQ3R method helped students break down problems, come up with plans, do calculations, and check their answers in a better way. Based on this, the study suggests that math teachers should use strategies like SQ3R, especially when teaching geometry, because they can help students understand math concepts and think more clearly. This method is a practical and effective
49 way to encourage students to take an active role in their learning.

Keywords: Quasi-experimental design, Geometry, Student engagement, Math problem-solving, SQ3R Strategy

Abstrak

Keterampilan siswa Indonesia dalam pemecahan masalah matematika masih dianggap rendah,
43 *terutama dalam pelajaran geometri seperti segitiga. Salah satu faktornya adalah minimnya strategi pembelajaran yang dapat meningkatkan keterlibatan kognitif siswa dalam mengerti dan*
25 *menyelesaikan masalah secara teratur. Strategi SQ3R (Survey, Question, Read, Recite, Review) yang awalnya dirancang untuk meningkatkan pemahaman dalam membaca, memiliki kemungkinan untuk digunakan dalam pembelajaran matematika karena menekankan pada proses berpikir yang aktif dan*
68 *reflektif. Penelitian ini bertujuan menganalisis dampak strategi SQ3R terhadap peningkatan*
66 *keterampilan pemecahan masalah matematika pada topik segitiga. Penelitian ini mengambil*
9 *pendekatan kuantitatif dan menerapkan metode kuasi eksperimen berjenis Non-equivalent Control*
41 *Group Design. Sampel terdiri dari 72 siswa kelas VII di SMP Negeri 4 Cimahi yang dibagi menjadi kelompok eksperimen dan kontrol, keduanya dipilih secara purposif. Alat penelitian terdiri dari tes*
16 *penyelesaian masalah, pengamatan, dan dokumentasi. Temuan penelitian menunjukkan peningkatan yang signifikan dalam kemampuan pemecahan masalah siswa pada kelompok eksperimen*

dibandingkan dengan kelompok kontrol. Strategi SQ3R terbukti berhasil mendukung siswa dalam memahami permasalahan, merancang solusi, melakukan perhitungan, dan memeriksa hasil secara terstruktur. Penelitian ini menyarankan agar guru matematika mulai mengintegrasikan strategi literasi aktif seperti SQ3R dalam pembelajaran, terutama pada materi geometri yang menuntut pemahaman konseptual dan penalaran spasial. Strategi ini dapat menjadi pendekatan alternatif yang relevan dan aplikatif untuk meningkatkan kualitas pembelajaran matematika yang berpusat pada siswa.

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INTRODUCTION

Problem-solving skills are a key part of learning mathematics that students need to understand well. In the Independent Curriculum and many other education policies, this skill is important for helping students develop their ability to think critically and analyze things carefully. But research shows that Indonesian students still have low levels of math problem-solving ability.
4 Findings from the Programme for International Student Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMSS) indicate that Indonesian students frequently face challenges with questions requiring reasoning and the application of mathematical concepts in practical scenarios (Amalina & Vidákovich, 2023; Mulyani et al., 2024; Nadhiroh & Anshori, 2023; Pradiarti & Subanji, 2022; Zulaiha et al., 2023). One of the topics that is often a source of difficulty is geometry at both the elementary school and secondary school levels, especially triangle material in mathematics learning in Indonesia in 2017-2023, which requires the ability to visualize space, logic,
64 and mastery of basic concepts in an integrated manner in mathematics learning at the junior high school level (Fauzi & Arisetyawan, 2020; Fitriyana & Nursyahidah, 2022; Pamungkas, 2018; Saputro et al., 2015; Sari, 2024; Syawahid & Putrawangsa, 2017; Widjayanti et al., 2018).

This low ability can be due to the lack of a learning approach that stimulates active thinking
22 and the student's overall involvement in the process of understanding and solving problems. So far, mathematics learning is still dominated by conventional approaches that emphasize mechanistic
15 procedures and memorization of formulas, without providing enough space for students to develop reflective and critical thinking strategies. Therefore, a learning strategy is needed that is able to bridge the literacy and problem-solving aspects of mathematics, as well as enable cognitive student involvement in each stage of the learning process. Student involvement, to student learning achievement, especially in mathematics learning (Abidin, 2020; Jeheman et al., 2019; Mulyani et al., 2024).

35 The Survey, Question, Read, Recite, and Review (SQ3R) strategy is one of the active reading techniques that has been widely used to improve reading comprehension at various levels of education. Some studies have shown that this strategy is effective in improving students' understanding of reading texts because it activates systematic and repetitive thinking processes. Although originally developed for reading literacy, the SQ3R strategy has great potential to be adapted in mathematics learning, particularly in understanding concepts and solving problems that require in-depth analysis. By applying the stages in SQ3R to mathematical problem solving, students are encouraged to pre-analyze the problem, formulate questions, read relevant information, review understanding, and reflect on solutions (Cataraja, 2022; Kurniawan & Afifi Rahman, 2024; Misnawan

et al., 2020; Nugraheni & Yunianta, 2018; Sudarsana, 2021).

The urgency of this research lies in the need for innovation in mathematics learning strategies
47 that not only focus on the final result, but also on the students' thinking process in solving problems.
Active literacy strategies such as SQ3R have been shown to be effective in improving understanding
5 of concepts in a variety of contexts. For example, Riansyah (2022) showed that the application of the
SQ3R method in high school students resulted in a significant improvement in understanding of
26 mathematical concepts, with the average score of the experimental group (54.12) much higher than
that of the control group (22.34). Similarly, research by Rahayuningsih and Kristiawan (2021) on
students shows that SQ3R is able to encourage independent learning activities which has an impact
on the level of concept understanding by 84.25%. However, the two studies have not specifically
53 examined the application of the SQ3R strategy in the context of geometry learning at the junior high
school level and have not explicitly highlighted the aspect of solving mathematical problems. In
addition, empirical studies that consider student affective variables such as learning attitudes on the
20 effectiveness of this strategy are also still limited. Therefore, this study aims to fill this gap by
39 analyzing the effectiveness of the SQ3R strategy in improving problem-solving skills in triangular
materials in grade VII of junior high school.

19 Although the SQ3R strategy has been extensively researched and proven to be effective in
5 learning outside of mathematics learning, with the application of SQ3R in other learning to improve
students' reading comprehension, its application in mathematics learning is still very limited,
especially in the context of developing problem-solving skills (Dewi & Ganing, 2020). Most research
on SQ3R has focused on language or literacy subjects, and few have examined how the stages in this
strategy can be used to improve conceptual understanding and analytical skills in mathematics. On
the other hand, studies that address improving mathematical problem-solving skills more often use
problem-based learning (PBL) approaches, heuristic approaches, or cooperative strategies, without
integrating active literacy techniques such as SQ3R (Subekti, 2024). In addition, there have not been
many studies that have specifically explored the effectiveness of SQ3R in improving mathematical
13 problem-solving abilities on geometry topics such as triangles. Thus, this research is important to fill
these gaps and provide alternative learning strategies that can improve the quality of mathematics
13 learning as a whole (Juliawan et al., 2017).

In addition, the topic of triangles as part of basic geometry is one of the important but also
complex subjects, which demands simultaneous conceptual understanding and spatial visualization.
However, studies on the effectiveness of active literacy-based learning strategies on this topic are
still very limited. This gap indicates that there is room for further exploration of how SQ3R can be
57 adapted into the context of mathematics learning, particularly in helping students understand the
concept of triangles and improve their problem-solving skills systematically (Suherman et al., 2021).

8 In general, the purpose of this study is to explore and analyze the effect of the application of
the SQ3R strategy on improving students' mathematical problem-solving ability in triangle material.
42 This research aims to fill the gaps in the literature related to the application of literacy strategies in
46 mathematics learning, as well as contribute to the development of a more integrated learning
45 69 approach between concept understanding, critical thinking skills, and problem-solving strategies. It
is hoped that the results of this SQ3R research can provide alternatives and effective learning
16 strategies for teachers in improving the quality of students' mathematics learning processes and
67 outcomes at both the elementary, junior high and high school levels.

METHOD

2 This study adopted a quantitative approach with a quasi-experimental design. This design was chosen because the researcher could not fully control all external variables that might affect learning outcomes, but it still enabled an empirical assessment of the treatment's impact on the dependent 38 variables. The research applied a non-equivalent control group design, comprising two groups 48 selected through purposive sampling: an experimental group taught using the SQ3R (Survey, Question, Read, Recite, Review) strategy, and a control group that received conventional instruction (Isnawan, 2020).

The research procedure was carried out in stages, including preparation, implementation of learning strategies, data collection, and data analysis. These steps were systematically arranged to ensure that 7 the SQ3R strategy was consistently applied in the experimental class, while the control group followed conventional learning methods (Arikunto et al., 2015).

Research Procedure

The participants were seventh-grade students from SMP 4 Cimahi who had similar academic performance and learning facilities. Sampling was conducted purposively, taking into account teacher recommendations and results of preliminary observations. The purpose was to examine differences 5 in mathematical problem-solving skills between students taught with the SQ3R strategy and those 62 taught with conventional methods. Each group comprised 36 students, yielding an equal number in both experimental and control groups. As a comparison, the control group was taught through commonly used classroom practices.

58 Instrument reliability was tested using the Cronbach's Alpha coefficient since the instrument contained more than two items, and internal consistency was a key requirement. The reliability coefficient obtained was 0.82, which falls into the high category according to Guilford's criteria, confirming that the instrument was appropriate for use. In addition, each item was analyzed for difficulty and discriminating power, with minor revisions made to two items that contained unclear wording. The criteria for mathematical problem-solving ability are summarized in Table 1. Scores from all items within each indicator were averaged to classify students' abilities into categories (Cronbach, 1951).

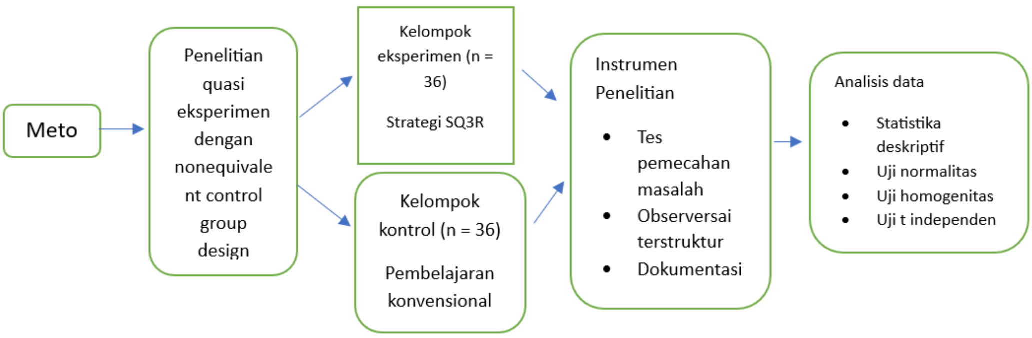

Figure 1. Research Procedure

33 The subject of the study is a grade VII student of SMP 4 Cimahi who has equivalent 15 characteristics in terms of academic achievement and learning facilities. Class selection is carried out purposively based on the consideration of the subject teacher and the results of initial observation. This research seeks to identify the difference in problem-solving abilities between students engaged in learning using the SQ3R strategy and those who use traditional methods. The experimental group consisted of 36 students, as well as the control group of the same number. As a comparison, the control group used a conventional learning approach that teachers usually apply.

The reliability test was carried out using the *Alpha Cronbach coefficient*, because the instrument has more than two questions, is homogeneous, and is measured by one main assessor so
17 that the calculation of internal consistency is a priority. The calculation results showed a reliability coefficient of 0.82, which according to Guilford's criteria was in the high category, so the instrument
51 was declared suitable for use. In addition, each question item was analyzed for the level of difficulty and differentiating power to ensure the quality of the item, and minor improvements were made to
59 two questions that had unclear redactions. The criteria for problem-solving ability can be seen in Table 1. The score of all students in each indicator is then calculated to find out the average achievement and category of students' abilities (Cronbach, 1951).

Table 1. Classification of Mathematics Problem-Solving Ability Test Results

Average	Criterion
$90^0 \le A < 100\%$	Excellent
$75^0 \le B < 90\%$	Good
$55^0 \le C < 75\%$	Enough
$40^0 \le D < 55\%$	Less
$0^0 \le E < 40\%$	Ugly

The study used math problem-solving tests as the main way to check students' abilities before and after the treatment (pretest and posttest). Observations were done during learning to see how well the SQ3R strategy was being used and how involved the students were. Also, there were records like attendance lists, lesson plans, student work, and notes about the learning process. Some teachers or students were also asked optional questions in semi-structured interviews to get their views on how SQ3R was being used in learning.

Data analysis goes through several steps. First, the numbers from the test are checked to see if they
54 follow a normal pattern and if they have similar spread. Then, a test called independent sample t-
52 test is used to find out if there are differences between the groups. Another test, called paired sample t-test, is used to check if there is improvement within each group. Qualitative data from observations, documentation, and interviews were analyzed using data triangulation to check the consistency of findings from various sources. This triangulation is carried out by comparing test
34 results, observation notes, and information from interviews to ensure the validity of the interpretation of the research results.

RESULTS AND DISCUSSION

Results

The research results show that using the SQ3R strategy on triangular topics greatly improved students' ability to solve math problems. When looking at the data, there was a clear increase in the scores for each part of problem-solving skills, when comparing the scores before and after the strategy was used in the experimental group.

Students' mathematical problem-solving performance was assessed through both pretests and posttests to empirically determine the impact of the SQ3R strategy. The pretest served to
30 evaluate the equivalence of initial abilities between the experimental and control groups, while the posttest was administered to measure the effectiveness of the treatment after the learning process.

63 The comparison of pretest and posttest results provided evidence of the progression in students' problem-solving skills before and after the learning intervention. Initially, the pretest confirmed that the groups possessed comparable baseline abilities prior to treatment. Subsequently, the posttest was done to check how much each group improved. One group used the SQ3R strategy, and the other group followed regular teaching methods.

11 The results of the mathematical problem-solving skills of students from each class show
36 different results, which can be seen in Table 2 below:

Table 2. Descriptive statistics *Pretest* Students' Mathematical Problem-Solving Ability

Class	Statistics					Troubleshooting Indicators			
	N	Avrg	SD	Min	Max	1	2	3	4
Experiment with the SQ3R Method	36	51,11	58	17	82	48,61	52,02	52,5	51,11
Control with Conventional methods	36	50,31	54	17	78	52,78	51,67	49,03	48,05
Average Score		50,71		17	80	50,69	51,85	50,76	49,58

Table 2 illustrates that the pretest outcomes of both groups are relatively equivalent, both in terms of mean scores and data distribution. These results indicate that prior to the intervention, the groups possessed a similar level of initial competence. Such equivalence provides a valid foundation for making an objective comparison of the treatment effects in subsequent stages.

After the instructional intervention, a posttest was conducted to assess performance
3 differences between the experimental group, which was taught using the SQ3R method, and the control group that received standard lessons. The outcomes of the exam following the classes are presented in the table below.

Table 3. Students' *Mathematics Problem-Solving* Posttest Ability

Class	Statistics					Troubleshooting Indicators			
	N	Avrg	SD	Min	Max	1	2	3	4
Experiment Class with the SQ3R Method	36	80,72	58	58	95	86,68	81,81	74,86	84,4
Control Class with Conventional Methods	36	71,53	45	45	85	72,2	71,94	70,83	71,67
Average Score		50,71		51,5	90	79,4	76,87	72,85	78,03

50 Table 3 shows that the experimental group had a much bigger improvement in scores than the
19 control group. This difference shows that the SQ3R strategy works well in helping students better understand information, come up with solutions, do calculations, and check their results properly.

27 From a statistical perspective, the t-test results of the posttest data revealed a significant difference between the two groups ($p < 0.001$). This finding confirms that the SQ3R strategy
4 contributes meaningfully to the improvement of students' mathematical problem-solving skills. The results are consistent with prior studies, which reported that active literacy-based strategies such as SQ3R foster students' conceptual understanding and cognitive engagement (Rahayuningsih & Kristiawan, 2021; Riansyah, 2022).

The integration of the SQ3R strategy into mathematics instruction enables students to concentrate on a structured thinking process: beginning with surveying problems, generating key questions, reading and comprehending relevant information, retaining essential points, and finally reviewing and evaluating solutions. Each stage of the SQ3R approach stimulates active and reflective thinking, which is essential for addressing mathematical problems comprehensively.

Normality Test

The assessments to determine whether the problem-solving ability scores from the pretest were normally distributed indicated that the experimental group had a computed χ^2 value of 4.71, falling short of the table value of 11.3. This indicates that the experimental group's data adheres to a normal distribution. The control group demonstrated a computed χ^2 value of 5.89, which is less than the table value of 11.9, indicating that their data adheres to a normal distribution as well.

For the posttest results, analysis of the final test data in relation to the normality test revealed that the experimental class produced χ^2_calculated = 7.56, while the control class obtained χ^2_calculated = 10.39. Both values were lower than χ^2_table = 11.3, indicating that the posttest data of both groups followed a normal distribution.

Homogeneity Test

According to the evaluation of the pretest results, the scores for the experimental and control groups were uniformly distributed. The same was true for the final test scores, showing similar even distribution. For the pretest, the calculated F value was 1.10, which is less than the table value of 2.29. For the posttest, the calculated F value was 1.23, also less than the table value of 2.29.

Hypothesis Test

Because the pretest and posttest results followed a normal distribution and had similar variability, we used an independent sample t-test to test our hypothesis. This analysis aimed to find out if there was a significant difference in performance between the experimental group, which learned using the SQ3R method, and the control group, which learned through traditional methods.

Table 4 displays the results of the pretest score comparison between the two groups prior to treatment. This comparison aimed to confirm that there were no significant differences in their initial abilities, thereby establishing that both groups started with an equivalent level of competence.

Table 4**.** Comparison of Experimental Class and Control Class Pretest Results

Variable	T-Statistics	Df	p-value	Mean Difference	Conclusion (α = 0.05)
Experimental vs Control Pretest	0,27	70	0,79	0,81	Insignificant

The independent sample analysis of pretest scores yielded t(70) = 0.27 with p = 0.79 (α = 0.05). Since the p-value exceeded 0.05, It can be said that the experimental and control groups started with similar levels of ability.. The mean difference of 0.81 further indicates that the average pretest scores of both groups were nearly identical, thereby fulfilling the equivalence requirement for assessing the impact of the treatment.

Table 5 shows the results of the t-test performed on the posttest data, aimed at assessing the effect of the SQ3R strategy on students' abilities in solving mathematical problems. These results serve as the foundation for concluding the effectiveness of the SQ3R approach in the context of mathematics learning on triangle material.

Table 5. Comparison of Posttest Results of Experimental Class and Control Class

Variable	t-statistic	Df	p-value	Mean Difference	Conclusion (α = 0.05)
Posttest Experiment vs Control	3,89	70	0,0	9,19	Significant

A t-test analyzing the scores post-test indicated a t-value of 3.89, with 70 degrees of freedom and a p-value lower than 0.001. As this p-value is below the standard significance threshold of 0.05, it indicates a notable difference between the two groups following the treatment. The mean score difference was 9.19, indicating that the experimental group made significantly greater improvements than the control group. This finding indicates that the SQ3R strategy enhanced students' ability to solve math problems.

In addition to comparing the pretest and posttest results between different groups, they also checked if each group improved significantly in problem-solving skills before and after the treatment. To do this, they used a paired sample t-test to see how effective the learning was within each group on its own.

Table 6 shows the results from a paired t-test comparing the scores before and after the test for both groups. These results help us understand how much the SQ3R strategy and regular teaching methods each helped improve students' ability to solve math problems.

Table 6. Paired Sample (Pre-Post in Group) Test Experimental and Control Class

Group	t-statistic	Df	p-value (2-tailed)	Mean Difference
Experiment (Pre-Post)	-12,85	35	0,00	-29,61
Control (Pre-Post)	-9,23	35	0,00	-21,22

The results of the Paired Sample t-test shown in Table 6 indicate a significant difference in the pretest and posttest scores for both the experimental and control groups. In the experimental group taught with the SQ3R strategy, the t-statistic was -12.85 and the p-value (2-tailed) was 0.00 < 0.05, showing a notable enhancement in mathematical problem-solving skills. The average difference of -29.61 indicates that the posttest score was significantly greater than the pretest, demonstrating a notable advancement.

In the control group that received conventional instruction, the t-statistic was -9.23 with a p-value of 0.00 < 0.05, which also indicated an increase in problem-solving ability. However, the mean difference of -21.22 was lower compared to the experimental group. This suggests that while conventional learning contributes to improved outcomes, the extent of progress is smaller than that achieved through the SQ3R strategy.

These results show that using the SQ3R method when teaching about triangles helps students
10 improve their math problem-solving skills more than usual teaching ways. The SQ3R method
involves steps like Survey, Question, Read, Recite, and Review, which help students understand
ideas better, link concepts to real-life situations, and develop thinking skills needed to solve
problems effectively.

1 21 The normality and homogeneity tests indicated that the initial test scores from both the
experimental and control groups had a normal distribution and comparable variances, making the t-
37 test appropriate to use. The results showed there was no big difference between the groups at the
start, meaning they were similar to begin with. The same tests were also done on the final test
21 scores, and they met the required conditions for using the t-test. The analysis found that the null
hypothesis (H_0) was not true, and the alternative hypothesis (H_a) was correct. The determined t-
value was 0.005, which is below the tabulated value of 2.66, while the computed F-value was 3.3.
This shows that the SQ3R strategy had a meaningful effect compared to regular learning methods.

1 Before the study started, there was no big difference between the two groups ($p = 0.79$),
which means they started off with similar skills. After the study ended, there was a big difference ($p < 0.001$), with the experimental group scoring higher on average (80.72) than the control group (71.53). Both groups got better from the beginning to the end: the experimental group went up by 29.61 points (from 51.11 to 80.72), and the control group improved by 21.22 points (from 50.31 to 71.53). The improvement was much bigger in the experimental group.

The study compared two groups: one that used the SQ3R strategy for learning and another
7 that followed the usual teaching method. The results showed that the SQ3R method helped students
improve their math problem-solving skills much more than the traditional approach. A statistical
18 analysis known as the independent sample t-test revealed a significant disparity in the average
scores of the two groups ($p < 0.05$). This means the SQ3R strategy really makes a difference in how well students can solve math problems. So, the idea that students who learn with SQ3R do better in math problem-solving than those who use the conventional method is supported by the results.

Discussion

7 The findings of the study demonstrate that utilizing the SQ3R strategy markedly enhances
students' mathematical problem-solving abilities in comparison to traditional learning methods. The enhancement seems consistent across all measures, with the greatest success in understanding issues and devising solutions. This is in line with the role *of the Survey* and *Question* stage in SQ3R which encourages students to actively read, identify important information, and formulate questions before starting the calculation process (Sudarsono & Astutik, 2024; Sulastri & Suhandoko, 2024; Yuda & Mustadi, 2025).

Meanwhile, the indicator of re-examining the answer experienced a relatively lower increase
compared to other indicators. This condition can be caused by the nature of reflective skills that
require repeated practice and longer time to develop optimally. Differences in achievement
31 between indicators can also be influenced by external factors such as learning motivation, family

support, previous learning experiences, and the dynamics of classroom discussions (Cook & Artino, 2016; Ramli et al., 2018).

In general, the results of this study match what was found in earlier research by Riansyah (2022) and Rahayuningsih & Kristiawan (2021). Those studies showed that the SQ3R method helps students understand ideas better and become more independent in their learning. The main difference here is that this study uses SQ3R with junior high school students, focusing on solving problems that need logical and spatial thinking. The five steps of SQ3R—Survey, Question, Read, Recite, and Review—help students find key information, work together, solve problems, and check their work in a clear and organized way.

Triangulating data through tests, observations, and documentation reinforces the validity of the findings, while confirming that active literacy strategies such as SQ3R are not only beneficial in improving reading comprehension, but also effective in strengthening mathematical reasoning skills. Thus, SQ3R can be an alternative learning strategy that is relevant and applicative to improve mathematical problem-solving abilities in materials that require deep conceptual understanding and strong spatial reasoning (Bulut, 2017; Chang et al., 2017; Lawrence & Tar, 2018; Patcharapiyakul & Promnont, 2025; Sunarti et al., 2021; Wang & Degol, 2016).

Implication of Research

These findings provide important implications for teachers, particularly in the design of Learning Implementation Plans (RPPs) that integrate SQ3R measures explicitly and in a structured manner (Maruti et al., 2023; Pebriantika & Aristia, 2021; Setyaningsih et al., 2019). One form of application is to add the "Questions whether and how in the process of understanding the material" at the beginning of the material to support the *Question stage*, as well as the "Summary and Correction" column at the end of the question exercise to strengthen *the Review* stage (Amikratunnisyah & Fatonah, 2023; Wang & Degol, 2016). Teachers can also combine this strategy with small group learning, formative feedback, and answer checking exercises so that all indicators can develop in a balanced manner (Qishta et al., 2021; Rada & Jayanti, 2022).

Limitation

However, this study has limitations due to the limited number of respondents and the scope of material that only focuses on the concept of triangles, so generalization of results needs to be done carefully. The implications of this study show the importance of teacher development and training in implementing active literacy-based learning strategies to strengthen the quality of the learning process, especially in materials that require high-level thinking skills such as geometry.

CONCLUSION

This study shows that using the SQ3R method really helps junior high school students get better at solving math problems related to triangles. It helps them understand the problems, plan how to solve them, do the math steps correctly, and check their answers in a clear and organized way. These findings reinforce previous studies, while expanding their application to the context of complex problem-solving at the junior high school level, showing that SQ3R is effective not only for conceptual understanding but also for the development of systematic thinking and numeracy. Although limited to the number of respondents and the scope of the triangular material, these

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results confirm the importance of teacher training in the implementation of active literacy strategies to improve the quality of learning in materials that require high-level thinking skills.

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