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The Effect of the RME-Based Argument-Driven Inquiry (ADI) Learning Model on Mathematical Problem-Solving Skills Regarding Systems of Linear Equations in Three Variables (SPLTV)

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ABSTRACT

Mathematical problem-solving ability is an essential competency in mathematics learning, yet students still experience difficulties in understanding problems, determining strategies, and evaluating solutions. Although Argument-Driven Inquiry (ADI) and Realistic Mathematics Education (RME) have been widely applied in mathematics learning, their integration to improve mathematical problem-solving ability remains relatively limited. Therefore, this study aims to analyze the effect of the RME-based ADI learning model on students' mathematical problem-solving abilities in Systems of Linear Equations in Three Variables (SPLTV). This quantitative study employed a quasi-experimental Pretest-Posttest Control Group Design involving 72 Grade X students at SMA Negeri 2 Percut Sei Tuan. Data were collected using an essay test and analyzed using descriptive statistics, the Shapiro–Wilk test, Levene's test, independent-samples t-test, and Cohen's d. The experimental class obtained a higher mean post-test score (85.24) than the control class (67.56), with $p < 0.001$ and an effect size of 3.548, categorized as a huge effect. These findings indicate that the RME-based ADI model can be an effective alternative for improving students' mathematical problem-solving abilities.

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1. INTRODUCTION

Mathematical problem-solving ability is a core competency that students must master in mathematics education; through this ability, they are trained to identify information, formulate strategies, and apply learned concepts to solve problems, whether academic or contextual in nature [1]. This is essential as a foundation for tackling various challenges, both now and in the future [2]. This ability is regarded as one of the main objectives of mathematics education, encompassing the skills of understanding problems, constructing mathematical models, solving those models, and interpreting the solutions obtained; it also helps pupils solve various problems in everyday life, as many activities involve mathematical concepts and their application. [3] Consequently, a solid understanding of concepts serves as a vital foundation enabling students to solve a wide range of problems, including even the simplest ones [4]. Various research findings also support the importance of mathematical problem-solving skills. Siswanto [5] explains that mathematical problem-solving skills play a vital role in developing higher-order thinking skills, such as analysing, reasoning, evaluating, and determining the correct solution, whilst the findings of a Systematic Literature Review by Az-Zahra et al. [6] indicate that these skills reflect learners' ability to think logically, critically, and systematically in order to solve various problems.

According to Polya, as cited in Talantu et al. [7], the problem-solving process comprises four stages: understanding the problem, devising a plan, carrying out the plan, and reviewing the obtained solution. These stages demonstrate that problem-solving is a systematic and reflective thinking process, rather than one merely oriented toward the final answer. In line with this, the Independent Curriculum emphasizes the importance of communication, representation, and problem-solving by connecting mathematical concepts to real-life situations, while also fostering an appreciation for the practical benefits of mathematics in everyday life [8]. In the current 21st-century context, the goal of mathematics education is for students to embody the "4C" characteristics: Communication, Collaboration, Critical Thinking and Problem Solving, and Creativity and Innovation (Siswanto [5]). This perspective aligns with the process standards of the National Council of Teachers of Mathematics (NCTM), as cited in Siswanto [5], which position problem-solving as one of five key mathematical competencies alongside reasoning and proof, communication, connections, and representation.

Despite its vital importance, the reality is that Indonesian pupils' mathematical problem-solving skills remain relatively low. This situation is reflected in the results of the 2022 Programme for International Student Assessment (PISA) survey, in which Indonesia ranked 70th out of 81 participating countries with an average mathematics score of 366, which remains well below the OECD member countries' average of 472 [9]. This situation is reflected in the 2022 PISA results, where Indonesia ranked 70th out of 81 participating countries with an average mathematics score of 366, well below the OECD average of 472. These results indicate that the mathematical proficiency of Indonesian students, particularly in solving problems requiring reasoning and the application of concepts, remains suboptimal. These findings align with the 2018 PISA results, which showed that only about 1% of Indonesian students reached Level 5 in mathematical literacy. This percentage lags significantly behind countries such as China (44%) and Singapore (37%), highlighting the continued need to improve mathematical problem-solving skills among students in Indonesia **[10]**. Such low achievement levels indicate that the majority of Indonesian students struggle when faced with problems requiring reasoning, strategy formulation, and the interpretation of solutions within various real-life contexts.

Various studies have highlighted a similar phenomenon regarding students' limited mathematical problem-solving abilities. Research by Fitria and Sutirna [11] indicates that the majority of students fall into the moderate-to-low range of problem-solving proficiency, particularly when faced with word problems that require diverse solution strategies. Similarly, a study by Rinowati et al. [12] reveals that students struggle to systematically organize information within problems, making it difficult for them to determine the appropriate steps for a solution. These findings demonstrate that enhancing mathematical problem-solving skills remains a challenge requiring serious attention in mathematics education.

Similar issues were observed in the Grade X class at SMA Negeri 2 Percut Sei Tuan. Interviews with the mathematics teacher revealed that the majority of students still struggle to solve word problems and non-routine problems that require deeper analysis. Students tend to rely on solution examples provided by the teacher and are unable to independently determine a solution strategy when the problem format is modified. Furthermore, many students face difficulties translating contextual problems into mathematical models, as they struggle to identify given information, define variables, and select appropriate concepts and formulas. An analysis of student answer sheets also indicates that they often apply formulas directly without explaining their reasoning or outlining the solution steps systematically. These conditions suggest a need to improve their abilities in understanding problems, devising strategies, and reflecting on solution outcomes. These findings align with research by Nurmilah [13], which indicates that student weaknesses are most prevalent during the planning and evaluation stages of the mathematical problem-solving process.

Poor mathematical problem-solving skills do not occur without cause, but are influenced by various factors relating to pupils' learning processes. The factors influencing pupils' poor mathematical problem-solving skills, as identified in several previous studies, are as follows:

1. Poor conceptual understanding and the ability to comprehend problems [14]
2. Difficulty in determining problem-solving strategies [14]
3. A lack of student engagement in the learning process [15]
4. Less interactive teaching models [12]
5. Inadequate ability to evaluate solutions [14]

One of the factors contributing to pupils' poor mathematical problem-solving skills is a teaching approach that lacks interactivity. Given these conditions, an instructional model is needed that actively engages students in investigating problems, formulating strategies, and constructing logical arguments during the learning process. The Argument-Driven Inquiry (ADI) model is considered a suitable alternative, as it emphasizes inquiry activities, evidence-based claim formulation, discussion, and reflection on the results obtained. Syntactically, the ADI model consists of four stages, namely problem identification, data collection, the formulation of tentative arguments, and the argumentation session [16]. In the problem identification stage, pupils are guided to identify the problem presented by the teacher; in the data collection stage, pupils develop initial claims based on the data obtained; next, pupils formulate tentative arguments supported by evidence and reasoning; and in the argumentation session, pupils present and defend their scientific arguments to one another in a class discussion guided by the teacher. To enhance the meaningfulness of learning, the ADI model can be combined with the Realistic Mathematics Education (RME) approach;

the latter utilizes contextual problems as a starting point, thereby facilitating students' construction of mathematical concepts. Research by Z. Aulia and Hidayati [17] indicates that active student engagement contributes to improved problem-solving skills, while Rinowati et al. [12] demonstrate the positive impact of contextual approaches on the understanding of mathematical concepts.

In light of these issues, Argument-Driven Inquiry (ADI) was selected as a learning model capable of encouraging pupils to actively engage in inquiry, argument construction, discussion, and evaluation. The ADI model was then integrated with the Realistic Mathematics Education (RME) approach, which presents contextual problems as the starting point for learning. The integration of the two is necessary because ADI emphasises inquiry and argumentation, whilst RME reinforces these through real-world contexts that help pupils understand and solve problems in a meaningful way. Thus, RME-based ADI is expected to support the development of pupils' mathematical problem-solving skills. However, research integrating the ADI model with the RME approach remains relatively limited. The novelty of this study lies in integrating ADI and RME to support students' mathematical problem-solving abilities in SPLTV learning**.** Therefore, this study aims to analyze the effect of implementing the ADI model—grounded in RME principles—on students' mathematical problem-solving skills regarding the topic of Systems of Linear Equations with Three Variables (SPLTV) at SMA Negeri 2 Percut Sei Tuan. The study seeks to provide an effective instructional alternative for improving the quality of students' thinking and their mathematical problem-solving abilities.

2. METHOD

This study employs a quantitative approach using a quasi-experimental design to analyze the effect of implementing the Argument-Driven Inquiry (ADI) learning model based on Realistic Mathematics Education (RME) on students' mathematical problem-solving abilities. A Pretest-Posttest Control Group Design was utilized, involving one experimental class and one control class. The study was conducted at SMA Negeri 2 Percut Sei Tuan during the even semester of the 2025/2026 academic year, specifically from April 15 to May 22, 2026. The experimental class received instruction using the RME-based ADI model, while the control class underwent conventional instruction. Both classes were administered a pre-test and a post-test before and after the intervention to measure changes in students' mathematical problem-solving abilities.

Table 1. Research Design

Class	*Pretest*	Treatment	*Postest*
Experimental	O	X	O_p
Control	O	$-$	O_p

Notes:

X = Treatment using the RME-based ADI

O = Pre-test on mathematical conceptual understanding

O_p = Post-test on mathematical conceptual understanding

The study population consisted of all Grade X students at SMA Negeri 2 Percut Sei Tuan, totaling 286 students, with a total of 8 classes. The sample was determined using the cluster random sampling technique; this method was selected because the population was already divided into natural groups (classes), making it more appropriate to sample by group rather than by individual [18]. Cluster random sampling ensures that every class has an equal chance of being selected, thereby reducing bias during the sampling process [19]. Furthermore, this technique is considered more efficient in terms of time, effort, and research implementation when the population is already organized into pre-existing groups [20]. The steps for applying cluster random sampling in this study were as follows: (1) identifying all Grade X classes at SMA Negeri 2 Percut Sei Tuan as the study population; (2) designating each class as a single cluster; (3) assigning a number to each cluster; (4) conducting a random draw to select two clusters as the study sample; (5) including all students from the two selected classes in the sample; and (6) assigning one class as the experimental group and the other as the control group resulting in the selection of Class X-E as the experimental class and class X-D as the control class, with 36 students in each. Research data were collected using a mathematical problem-solving ability test consisting of essay questions; these were developed based on indicators covering problem comprehension, solution planning, strategy implementation, and result verification. The test was administered as a pre-test and post-test to both the experimental and control classes. The independent variable was the RME-based ADI learning model, while the dependent variable was students' mathematical problem-solving ability. Prior to use, the instrument underwent testing for validity, reliability, discriminating power, and difficulty level to ensure its suitability as a data collection tool.

Data analysis was conducted in stages using IBM SPSS Statistics version 27. The initial stage involved descriptive statistical analysis to describe the mean, maximum, and minimum values, as well as the standard deviation, for both pre-test and post-test results. Subsequently, prerequisite tests were performed, comprising a normality test using the Shapiro–Wilk test and a homogeneity test using Levene's test. Once all prerequisites were met, hypothesis testing was carried out using an independent-samples t-test to determine the difference in mathematical problem-solving abilities between the experimental and control classes. Finally, the magnitude of the effect of implementing the RME-based ADI learning model was analyzed using Cohen's d (effect size) to obtain information regarding the effectiveness of the applied learning model. The study was conducted with permission from the school, and the students' identities were kept confidential throughout the research process.

The Cohen's d formula used in this study is as follows:

$$d = \frac{\bar{X}_1 - \bar{X}_2}{S_p}$$

Notes:
d = effect size
$\bar{X}_1$ = mean post-test score for the experimental class
$\bar{X}_2$ = mean post-test score for the control class
S_p = combined standard deviation of both classes

3. RESULTS AND DISCUSSION (12 PT)

3.1. Results

The results include descriptive findings, prerequisite tests, hypothesis testing, and effect size analysis of students' mathematical problem-solving abilities.

Classical Assumption Test

Table 2. Normality Test Results for Problem-Solving Ability: Experimental and Control Classes

No	Class	*Shapiro-Wilk*	Note	Category
1	Control Pre-test	0,507	0,507 > 0,05	Normal
2	Control Post-test	0,112	0,112 > 0,05	Normal
3	Experimental Pre-test	0,723	0,723 > 0,05	Normal
4	Experimental Post-test	0,530	0,530 > 0,05	Normal

A normality test was conducted to determine whether the research data from the control and experimental classes followed a normal distribution, as this is a prerequisite for using parametric statistics. The Shapiro–Wilk test was used because the sample size in each group was less than 50 respondents (n = 36), with the criterion for normal data distribution being a significance level (Sig.) > 0.05. The results of the analysis show that all pre-test and post-test data for both classes met the assumption of normality; specifically, the control class's pre-test yielded a W value of 0.973 and a Sig. value of 0.507, while the control class's post-test yielded a W value of 0.951 and a Sig. = 0.112; the experimental class's pre-test had W = 0.979 and Sig. = 0.723; and the experimental class's post-test had W = 0.974 and Sig. = 0.530. All p-values are greater than 0.05, so the data are considered to be normally distributed. Thus, the assumption of normality has been met, and the data are suitable for analysis using parametric statistics; therefore, the analysis can proceed to the homogeneity test and hypothesis testing using the independent samples t-test.

Table 3. Results of Homogeneity Test for Problem-Solving Ability Scores of Experimental and Control Classes

		Levene statistic	Sig. Value	Category
Pre-test and post-test results of experimental and control classes	*Based on Mean*	1.591	0.194	Homogeneous
	Based on Median	1.393	0.247	Homogeneous

Based on Table 3, the results of the homogeneity test using Levene's Test show that the significance value (Sig.) based on the mean is 0.194. This value is greater than the significance level (Sig. = 0.194 > 0.05), so it can be concluded that the variances of the problem-solving ability data in the control class and the experimental class are homogeneous (equal). These results indicate that both groups exhibit relatively similar levels of data variability, thereby satisfying one of the conditions for conducting a parametric statistical test.

Hypothesis Test Results (Independent Sample T-Test)

Table 4. Independent Sample T-Test Results

		Levene's Test	Sig. Value	$t_{calculated}$
Post-test results for the control and experimental groups	*Equal Variances assumed*	0.127	< 0.001	-15.332
	Equal variances not assumed.		< 0.001	-15.330

Based on Table 4, the results of the hypothesis test using the independent samples t-test show that the significance value for Levene's Test for Equality of Variances is 0.127. Since this value is greater than 0.05 (0.127 > 0.05), the data are deemed to have homogeneous variances. Therefore, the decision-making basis uses the "Equal variances assumed" row. In that row, the calculated t-value is -15.054 with degrees of freedom (df) = 70 and a significance value (2-tailed) < 0.001. This significance value is less than the significance level $\alpha = 0.05$, so H_0 is rejected, and H_1 is accepted. The negative sign in the calculated t-value indicates that the data for the control group were imputed before those for the experimental group; however, this does not affect the hypothesis test decision.

Thus, it can be concluded that there is a significant difference in mathematical problem-solving abilities between students in the experimental class that utilized the Argument-Driven Inquiry (ADI) learning model based on Realistic Mathematics Education (RME) and those in the control class, which employed conventional instruction. Furthermore, the Mean Difference value of -17.67361 indicates an average gap of approximately 17.67 points between the control and experimental classes; consequently, it can be stated that the implementation of the ADI learning model based on RME enhances students' mathematical problem-solving abilities compared to conventional instruction. This demonstrates that the application of the ADI learning model based on RME has a significant impact on students' mathematical problem-solving abilities.

Effect Size Test Results (Cohen's d)

Table 5. Cohen's d Calculation Results

		Standardizer	*Point estimate*
Post-test results for the control and experimental classes	*Cohen's d*	4.98105	-3.548

Based on Table 5, the effect size calculation using Cohen's d yields a point estimate of -3.548. The negative sign merely indicates the direction of the difference in means between the control and experimental classes; therefore, the absolute value 3.548 is used to interpret the magnitude of the effect. According to Sawilowsky [21], Cohen's d values are interpreted according to several categories, namely:

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Table 6. Interpretation Criteria for Cohen's d

Cohen's d Value	Category	Description
0.00 – 0.19	Very small	Negligible effect
0.20 – 0.49	Small	Small effect
0.50 – 0.79	Moderat	Medium effect
0.80 – 1.19	Large	Large effect
1.20 – 1.99	Very Large	Very Large effect
$> \mathbf{2.00}$	Very Large	Huge effect

Based on Table 5, the Cohen's d value of 3.548 falls into the "huge effect" category, as it exceeds 2.00. These results indicate that the Argument-Driven Inquiry (ADI) learning model based on Realistic Mathematics Education (RME) exerts a very strong influence on students' mathematical problem-solving abilities. Thus, the RME-based ADI learning model is not only proven to have a significant effect, as evidenced by the Independent Samples t-test results, but also demonstrates a very high level of effectiveness in enhancing students' mathematical problem-solving skills compared to conventional instruction.

3.2. Discussion

The results of the hypothesis test using the Independent Samples t-test showed a Sig. (2-tailed) value of < 0.001, so H_0 was rejected and H_1 was accepted. These findings prove that the Argument-Driven Inquiry (ADI) learning model based on Realistic Mathematics Education (RME) has an effect on the mathematical problem-solving skills of 10th-grade students at SMA Negeri 2 Percut Sei Tuan and yields better results than conventional learning.

To reinforce the statistical analysis results, an analysis was conducted on the students' work in both the experimental and control classes. This analysis aimed to demonstrate differences in the problem-solving processes employed by students following the instructional intervention. These differences could be observed in the students' responses to a specific post-test question that incorporated four indicators of mathematical problem-solving ability: understanding the problem, formulating a solution plan, executing the plan, and reviewing the solution.

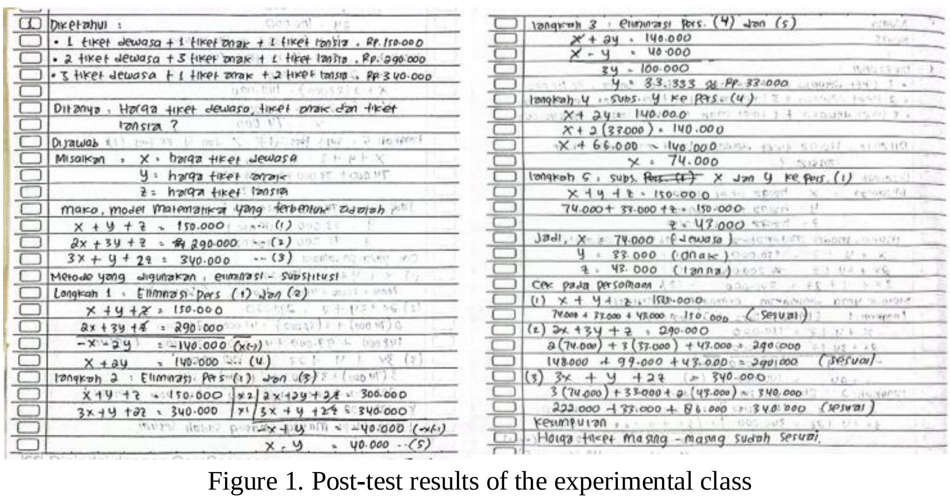

Figure 1. Post-test results of the experimental class

Based on Figure 1, regarding the "understanding the problem" indicator, students in the experimental class were able to more comprehensively identify the given information and the quantities to be determined. This is evident from the students' responses, in which they listed all the information provided in the problem and defined variables for adult, child, and senior citizen ticket prices before formulating a mathematical model. This indicates that RME-based ADI instruction helps students grasp the problem situation before determining a solution path, given that errors at the initial stage can affect subsequent stages of the solution process. This finding is supported by Wahab A. et al. [14], who state that the problem-understanding stage serves as the primary foundation for the problem-solving process, as the ability to identify known information and the unknowns determines the accuracy with which students formulate solution strategies in the subsequent stage.

Regarding the indicator of devising a solution plan, students demonstrated improved ability in determining the strategies to be employed. An analysis of their work reveals that students were able to appropriately select elimination and substitution methods and systematically structure the solution sequence. Students did not merely list the procedures to be used; they also provided justifications for their chosen steps through classroom discussions. This practice is crucial, as noted by Sutisna et al. [22], who state that the "devising a plan" stage is a vital part of problem-solving; during this phase, students determine the most suitable strategy based on the information they have comprehended. The accuracy of strategy selection directly influences student success in the subsequent implementation phase.

Regarding the indicator of executing the solution plan, the work of students in the experimental class demonstrated that the processes of elimination, substitution, and calculation were carried out sequentially, thereby minimizing procedural errors. Beyond obtaining the correct final answer, students were able to demonstrate the connections between solution steps, making their mathematical reasoning clear. This indicates that the implementation of RME-based ADI not only assists students in achieving correct results but also fosters the habit of constructing logical mathematical arguments throughout the solution process. These findings are supported by Noviyla [23], who states that during the "carrying out the plan" stage, students must apply their chosen strategies in a sequential and logical manner to ensure that solution steps are interconnected, ultimately leading to an accurate solution.

Finally, regarding the indicator of reviewing the solution, students demonstrated strong capabilities, evidenced by the process of substituting the obtained values back into all three equations to verify that the conditions of every equation were satisfied. Through RME-based ADI instruction, students became accustomed to evaluating their work, as the learning process required them to present and defend their constructed arguments before other groups. This habit cultivated an attitude of diligence and reflection, ensuring that students focused not only on the final answer but also on the validity of the solution process itself. The findings of this study align with research [17] indicating that students' active engagement during the learning process contributes to the improvement of mathematical problem-solving skills.

In general, Figure 1 shows that students in the experimental class were able to completely list the given and required information, correctly formulate a mathematical model as a system of linear equations in three variables, determine an appropriate solution strategy, carry out calculations systematically, and verify the results obtained.

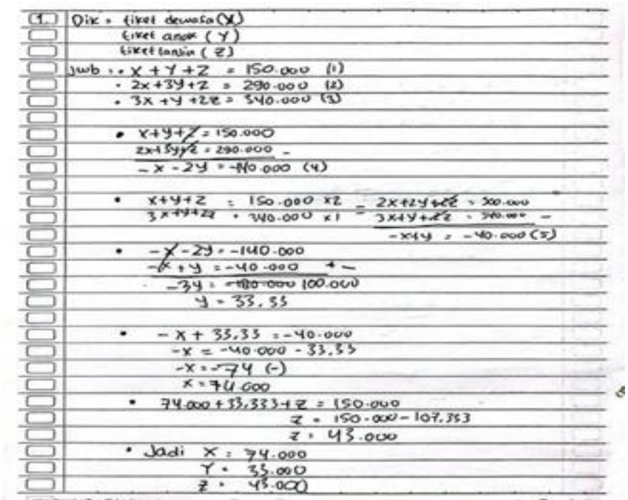
1. Dik : tiket dewasa (X)
tiket anak (Y)
tiket lansia (Z)
Jwb : • X + Y + Z = 150.000 (1)
• 2x + 3y + z = 290.000 (2)
• 3x + y + 2z = 540.000 (3)
• x + y + z = 150.000
2x + 3y + z = 290.000 −
−x − 2y = −140.000 (4)
• x + y + z = 150.000 ×2 2x + 2y + 2z = 300.000
3x + y + 2z = 340.000 ×1 3x + y + 2z = 340.000 −
−x + y = −40.000 (5)
• −x − 2y = −140.000
−x + y = −40.000 −
−3y = 100.000
y = 33,33
• −x + 33,33 = −40.000
−x = −40.000 − 33,33
−x = −74 (−)
x = 74.000
• 74.000 + 33,333 + z = 150.000
z = 150.000 − 107.333
z = 43.000
• Jadi X = 74.000
Y = 33.000
Z = 43.000

Figure 2. Post-test results for the control class

Based on Figure 2, regarding the "understanding the problem" indicator, students in the control class tended to immediately write down a mathematical model without detailing the known information or what was being asked. This incompleteness at the initial stage had the potential to affect subsequent stages of the solution. Furthermore, during the "devising a plan" stage, students generally proceeded directly to calculations without clearly outlining their solution plan; consequently, the strategy employed was not explicitly evident in their answers. Moving to the "carrying out the plan" stage, the solutions presented were concise, resulting in some steps not being fully explained. Although the final answer was correct, the demonstrated solution process did not fully reflect a systematic approach to problem-solving. Finally, the step of reviewing the solution was not observed; indeed, students often overlook this stage in conventional instruction.

In summary, Figure 2 shows that while students in the control class were able to obtain the correct final answer, their solution processes were relatively brief and lacked a complete depiction of the problem-solving stages; students tended to jump straight to elimination and substitution without providing detailed explanations of the steps taken or verifying the final result.

Based on the descriptions of Figure 1 and Figure 2 above, a difference in the quality of solutions is evident between students in the experimental class and those in the control class across all indicators of mathematical problem-solving ability. This difference indicates that the results depend not only on the final answer but also on the quality of the students' thought processes. Through RME-based ADI instruction, students become accustomed to formulating arguments, discussing solution strategies within groups, and defending their answers using mathematical evidence; consequently, each stage of problem-solving is carried out more systematically than in conventional instruction. These results are supported by research (Yuniar Nuril Eka, 2026) showing that the Argument-Driven Inquiry (ADI) learning model significantly influences students' critical thinking skills. Although the variables studied differed, both studies demonstrate that the ADI model enhances higher-order thinking skills through activities involving inquiry, argument construction, discussion, and result evaluation.

Furthermore, these findings are supported by research (Dwi Widad, 2025) stating that the Realistic Mathematics Education (RME) approach improves mathematical problem-solving abilities through the use of contextual problems in instruction. These findings align with the results of the present study, in which students learning via the RME-based ADI model demonstrated superior problem-solving abilities compared to students in the control class. This indicates that presenting problems related to everyday life helps students understand mathematical concepts in a more meaningful way.

Having established that the RME-based ADI learning model influences students' mathematical problem-solving abilities, an analysis was subsequently conducted to determine the magnitude of this effect. Calculations using Cohen's d yielded an effect size of 3.548, which, according to Sawilowsky's [21] classification, falls into the "huge effect" category. This implies that implementing the RME-based ADI model not only produces a statistically significant difference but also exerts a very strong impact on improving students' mathematical problem-solving abilities. The magnitude of this influence is reflected in the quality of the solution process demonstrated by students in the experimental class, who were able to show every step of the solution systematically, in contrast to students in the control class, who were more focused on the final answer.

These results are supported by research by Handayani et al. [24] reporting that the implementation of the ADI model enhances students' mathematical abilities through activities involving inquiry, argument construction, and the evaluation of derived solutions. Research by W. R. Aulia et al. [25] also demonstrates that the RME approach positively influences mathematical problem-solving skills; by engaging with problems rooted in real-life contexts, students find the concepts easier to comprehend. These consistent findings reinforce the conclusion that the significant impact observed in this study stems from the characteristics of the ADI model combined with the RME approach, thereby providing students with a more active and meaningful learning experience and enabling them to optimally develop their problem-solving skills.

Overall, the research findings indicate that the RME-based ADI learning model significantly influences students' mathematical problem-solving abilities, with a very large effect size. This is evidenced by the Independent Samples t-test results, which show a significant difference between the experimental and control classes; this is further corroborated by an analysis of student work demonstrating that the experimental class was better able to meet each problem-solving indicator and supported by an effect size of 3.548 (categorized as a "huge effect"). These results indicate that the Argument-Driven Inquiry (ADI) learning model based on Realistic Mathematics Education (RME) exerts a very strong influence on students' mathematical problem-solving abilities**.** These findings suggest that the RME-based ADI model can be used as an alternative approach to improve students' mathematical problem-solving abilities.

4. CONCLUSION

Based on the research findings and discussion, it can be concluded that the implementation of the Argument-Driven Inquiry (ADI) learning model based on Realistic Mathematics Education (RME) has a significant effect on students' mathematical problem-solving abilities regarding the topic of Systems of Linear Equations in Three Variables (SPLTV). This is demonstrated by the experimental class's average post-test score of 85.24, which is higher than the control class's score of 67.56. The results of the hypothesis test using an independent-samples t-test yielded a significance value (Sig., 2-tailed) of $0.001 < 0.05$; therefore, H_0 was rejected, and H_1 was accepted, indicating that the implementation of this learning model had a significant effect on students' mathematical problem-solving skills. In addition, the effect size calculated using Cohen's d 3.548 falls into the "huge effect" category, leading to the conclusion that the RME-based ADI learning model not only has a statistically significant effect but also exerts a very strong influence on improving students' mathematical problem-solving skills.

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